



EWEA

THE EUROPEAN WIND ENERGY ASSOCIATION



Wind in power

2013 European statistics

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Executive summary

2013 annual installations

- 11,159 MW of wind power capacity (worth between €13 bn and €18 bn) was installed in the EU-28 during 2013, a decrease of 8% compared to 2012 installations.
- EU wind power installations for 2013 show the negative impact of market, regulatory and political uncertainty sweeping across Europe. Destabilised legislative frameworks for wind energy are undermining investments.
- Wind power is the technology which installed the most in 2013: 32% of total 2013 power capacity installations - five percentage points higher than during the previous year.
- Renewable power installations accounted for 72% of new installations during 2013: 25 GW of a total 35 GW of new power capacity, up from 70% the previous year.

Trends and cumulative installations

- There are now 117.3 GW of installed wind energy capacity in the EU: 110.7 GW onshore and 6.6 GW offshore.
- The EU's total installed power capacity increased by 13 GW net to 900 GW, with wind power increasing by 11.2 GW and reaching a share of total installed generation capacity of 13%, up one percentage point compared to the previous year.
- Since 2000, over 28% of new capacity installed has been wind power, 55% renewables and 92% renewables and gas combined.
- The EU power sector continues its move away from fuel oil and coal with each technology continuing to decommission more than it installs.

Wind power installations

- Annual installations of wind power have increased over the last 13 years, from 3.2 GW in 2000 to 11.2 GW in 2013, a compound annual growth rate of 10%.
- A total of 117.3 GW is now installed in the European Union, an increase in installed cumulative capacity of 10% compared to the previous year.
- Germany remains the EU country with the largest installed capacity followed by Spain, the UK and Italy. Fifteen EU countries have more than 1 GW of installed capacity, including two newer EU countries (Poland and Romania), and eight EU countries have more than 4 GW of installed capacity.
- The volatility across Europe has contributed to 46% of all new installations in 2013 being in just two countries (Germany and the UK), a significant concentration compared to the trend of previous years whereby installations were increasingly spread across healthy European Markets. This is a level of concentration that has not been seen in the EU's wind power market since 2007 when the three wind energy pioneering countries (Denmark, Germany and Spain) together represented 58% of all new installations that year.
- A number of previously healthy markets such as Spain, Italy and France have seen their rate of wind energy installations decrease significantly in 2013, by 84%, 65% and 24% respectively.
- Offshore saw a record growth in 2013 (+1.6 GW); the outlook for 2014 and 2015 is stable, but not growing.
- The wind power capacity installed by the end of 2013 would, in a normal wind year, produce 257 TWh of electricity, enough to cover 8% of the EU's electricity consumption – up from 7% the year before.

Wind power installed in Europe by end of 2013 (cumulative)

FAROE ISLANDS*
7



European Union: 117,289 MW
Candidate Countries: 2,956 MW
EFTA: 830 MW
Total Europe: 121,474 MW

	Installed 2012	End 2012	Installed 2013	End 2013
EU Capacity (MW)				
Austria	296	1,377	308	1,684
Belgium	297	1,375	276	1,651
Bulgaria	158	674	7.1	681
Croatia	48	180	122	302
Cyprus	13	147	0	147
Czech Republic	44	260	9	269
Denmark	220	4,162	657	4,772
Estonia	86	269	11	280
Finland	89	288	162	448
France	814	7,623	631	8,254
Germany	2,297	30,989	3,238	33,730
Greece	117	1,749	116	1,865
Hungary*	0	329	0	329
Ireland	121	1,749	288	2,037
Italy	1,239	8,118	444	8,551
Latvia	12	60	2	62
Lithuania	60	263	16	279
Luxembourg	14	58	0	58
Malta	0	0	0	0
Netherlands	119	2,391	303	2,693
Poland	880	2,496	894	3,390
Portugal	155	4,529	196	4,724
Romania	923	1,905	695	2,599
Slovakia	0	3	0	3
Slovenia	0	0	2	2
Spain	1,110	22,784	175	22,959
Sweden	846	3,582	724	4,470
United Kingdom	2,064	8,649	1,883	10,531
Total EU-28	12,102	106,454	11,159	117,289
Total EU-15	9,879	99,868	9,402	108,946
Total EU-13	2,224	6,586	1,757	8,343

	Installed 2012	End 2012	Installed 2013	End 2013
Candidate Countries (MW)				
FYROM**	0	0	0	0
Serbia	0	0	0	0
Turkey	506	2,312	646	2,956
Total	506	2,312	646	2,956
EFTA (MW)				
Iceland	0	0	1.8	1.8
Liechtenstein	0	0	0	0
Norway	166	703	110	768
Switzerland	4	50	13	60
Total	170	753	125	830
Other (MW)				
Belarus	0	3	0	3
Faroe Islands	2	2	5	7
Ukraine	125	276	95	371
Russia*	0	15	0	15
Total	127	297	100	397
Total Europe	12,906	109,816	120,030	121,474

* Provisional data or estimate.

** Former Yugoslav Republic of Macedonia

Note: due to previous year adjustments, 372 MW of project de-commissioning, re-powering and rounding of figures, the total 2013 end-of-year cumulative capacity is not exactly equivalent to the sum of the 2012 end-of-year total plus the 2013 additions.

2013 annual installations

Wind power capacity installations

During 2013, 12,030 MW of wind power was installed across Europe, of which 11,159 MW was in the European Union, 8% less than the previous year.

Of the 11,159 MW installed in the EU, 9,592 MW was onshore and 1,567 MW offshore. In 2013, the onshore market decreased in the EU by 12%, whilst offshore installations grew by 34%. Overall, the wind energy market decreased by 8% compared to 2012 installations.

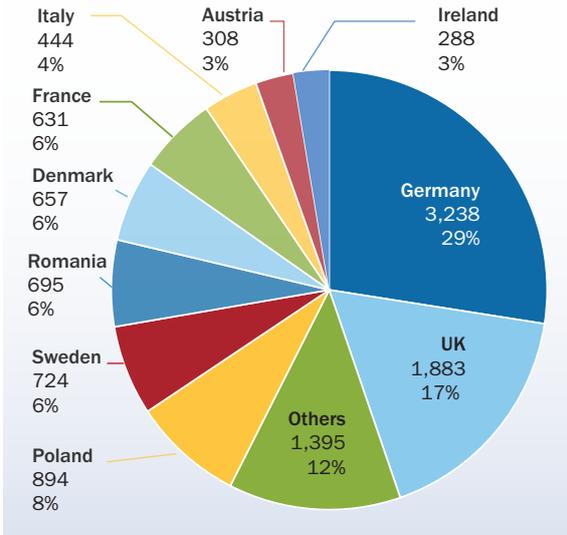
Investment in EU wind farms was between €13 billion (bn) and €18 bn. Onshore wind farms attracted around €8 bn to €12 bn, while offshore wind farms accounted for €4.6 bn to €6.4 bn.

In terms of annual installations, Germany was the largest market in 2013, installing 3,238 MW of new capacity, 240 MW of which (7%) offshore. The UK came in second with 1,883 MW, 733 MW of which (39%) offshore, followed by Poland with 894 MW, Sweden (724 MW), Romania (695 MW), Denmark (657 MW), France (631 MW) and Italy (444 MW).

The emerging markets of central and eastern Europe, including Croatia, installed 1,755 MW, 16% of total installations. In 2013, these countries represent a slightly smaller share of the total EU market than in 2012 (18%).

Moreover, 46% of all new EU installations in 2013 were in just two countries (Germany and the UK), a significant concentration compared to the trend of previous years when installations were increasingly spread across Europe. This is a level of concentration that has not been seen in the EU's wind power market

FIGURE 1.1: EU MEMBER STATE MARKET SHARES FOR NEW CAPACITY INSTALLED DURING 2013 IN MW. TOTAL 11,159 MW



since 2007 when the three wind energy pioneering countries (Denmark, Germany and Spain) together represented 58% of all new installations that year.

A number of previously large markets such as Spain, Italy and France have seen their rate of wind energy installations decrease significantly in 2013, by 84%, 65%, 24% respectively.

Offshore accounted for almost 14% of total EU wind power installations in 2013, four percentage points more than in 2012, further confirming the high level of concentration in annual installations during 2013.



Photo: Kay Ludwig

Power capacity installations

Overall, during 2013, 35 GW of new power generating capacity was installed in the EU, 10 GW less than in 2012.

Wind power accounted for 32% (11.2 GW) of new installations in 2013. Followed by solar PV (31%, 11 GW) and gas (21%, 7.5 GW).

No other technologies compare to wind, PV and gas in terms of new installations. Coal installed 1.9 GW (5% of total installations), biomass 1.4 GW (4%), hydro 1.2 GW (4%), CSP 419 MW (1%), fuel oil 220 MW, waste 180 MW, nuclear 120 MW, geothermal 10 MW and ocean 1 MW.

During 2013, 10 GW of gas capacity was decommissioned, as were 7.7 GW of coal, 2.7 GW of fuel oil and 750 MW of biomass capacity.

FIGURE 1.2: SHARE OF NEW POWER CAPACITY INSTALLATIONS IN EU, TOTAL 35,181 MW

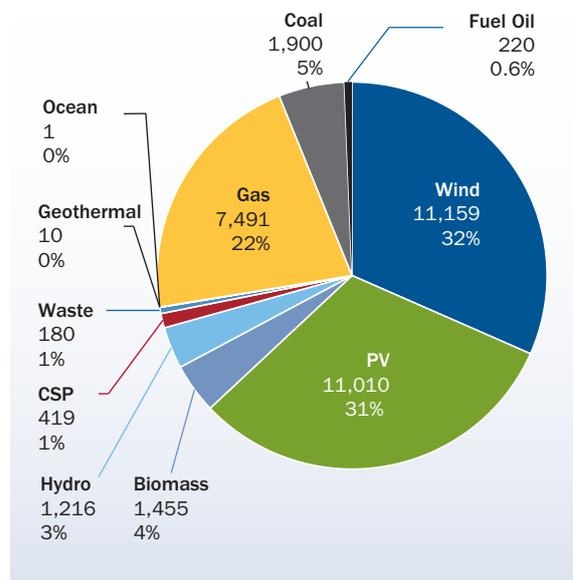
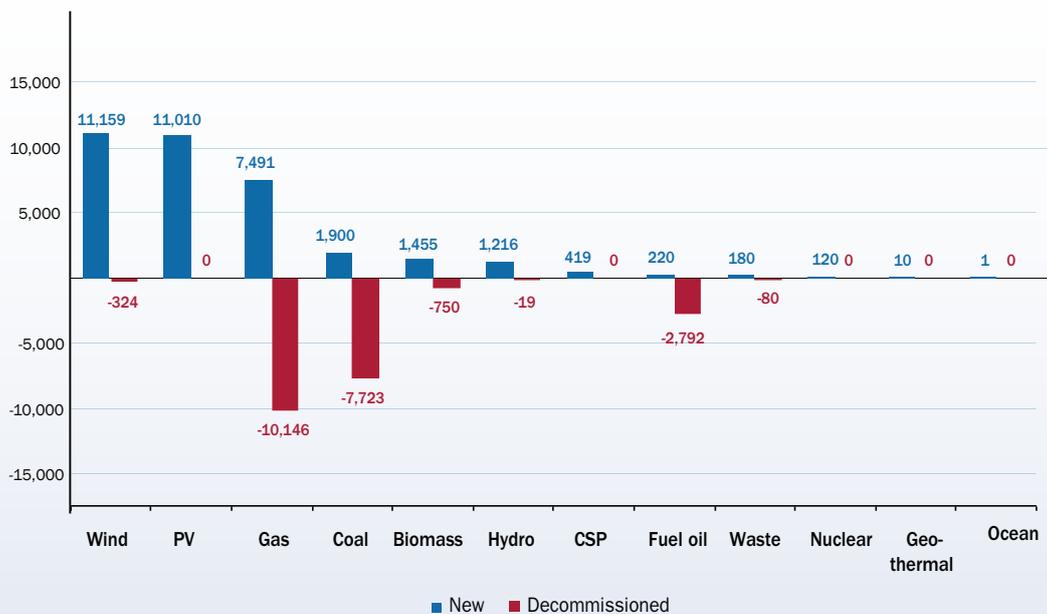


FIGURE 1.3: NEW INSTALLED POWER CAPACITY AND DECOMMISSIONED POWER CAPACITY IN MW

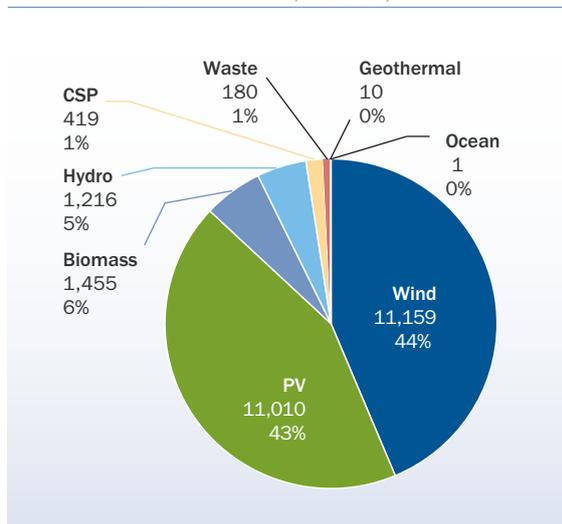


(1) Provisional data.

Renewable power capacity installations

In 2013, a total of 25.4 GW of renewable power capacity installations were installed. Over 72% of all new installed capacity in the EU was renewable. It was, furthermore, the sixth year running that over 55% of all new power capacity in the EU was renewable.

FIGURE 1.4: 2013 SHARE OF NEW RENEWABLE POWER CAPACITY INSTALLATIONS IN MW, TOTAL 25,450 MW



Trends & cumulative installations

Renewable power capacity installations

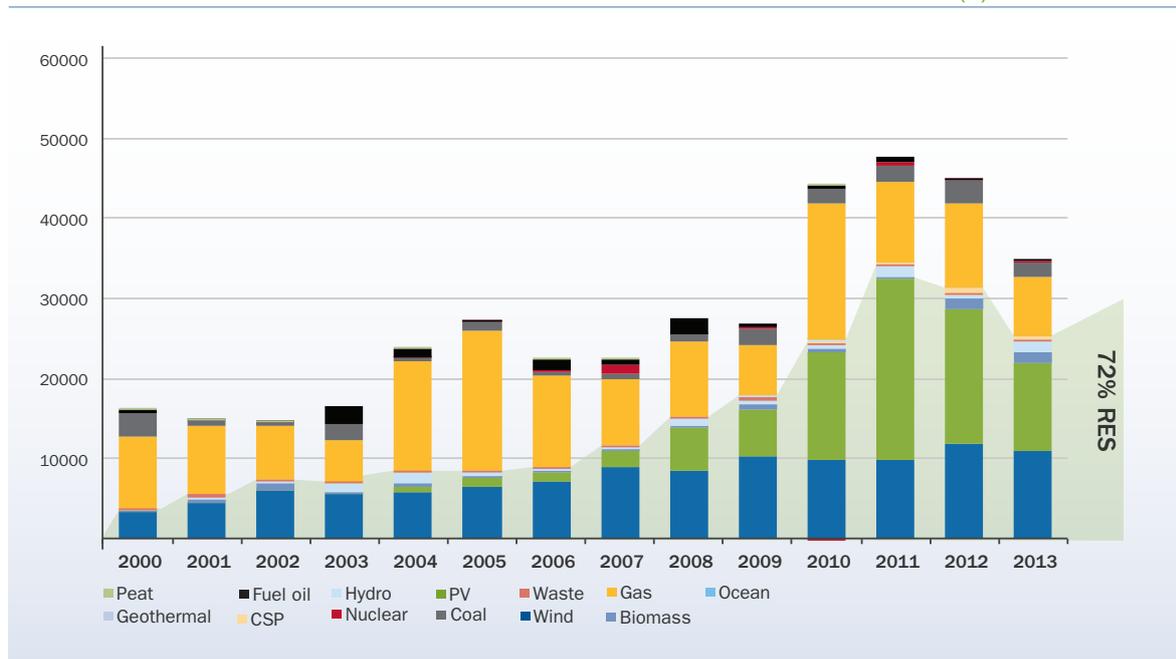
In 2000, new renewable power capacity installations totalled a mere 3.6 GW. Since 2010, annual renewable capacity additions have been between 24.7 GW and 35.2 GW, eight to ten times higher than in 2000.

The share of renewables in total new power capacity additions has also grown. In 2000, the 3.6 GW

represented 22.4% of new power capacity installations, increasing to 25 GW representing 72% in 2013.

385 GW of new power capacity has been installed in the EU since 2000. Of this, over 28% has been wind power, 55% renewables and 92% renewables and gas combined.

FIGURE 2.1: INSTALLED POWER GENERATING CAPACITY PER YEAR IN MW AND RENEWABLE ENERGY SHARE (%)

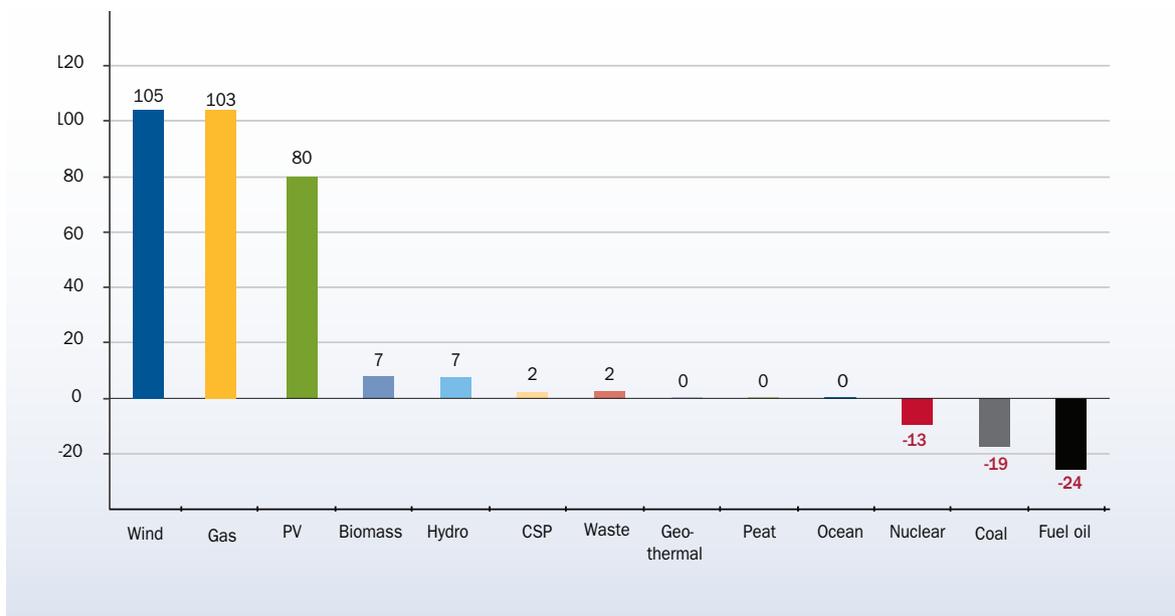


Net changes in EU installed power capacity 2000-2013

The net growth since 2000 of gas power (131.7 GW), wind (115.4 GW) and solar PV (80 GW) was at the expense of fuel oil (down 28.7 GW), coal (down 19 GW) and nuclear (down 9.5 GW). The other renewable technologies (hydro, biomass, waste, CSP, geothermal and ocean energies) have also been increasing their installed capacity over the past 13 years, albeit more slowly than wind and solar PV.

The EU's power sector continues to move away from fuel oil, coal and nuclear while increasing its total installed generating capacity with gas, wind, solar PV and other renewables.

FIGURE 2.2: NET ELECTRICITY GENERATING INSTALLATIONS IN THE EU 2000-2013 (GW)



Total installed power capacity

Wind power's share of total installed power capacity has increased five-fold since 2000; from 2.4% in 2000 to 13% in 2013. Over the same period, renewable

capacity increased by 61% from 24.5% of total power capacity in 2000 to 39.6% in 2013.

FIGURE 2.3: EU POWER MIX 2000

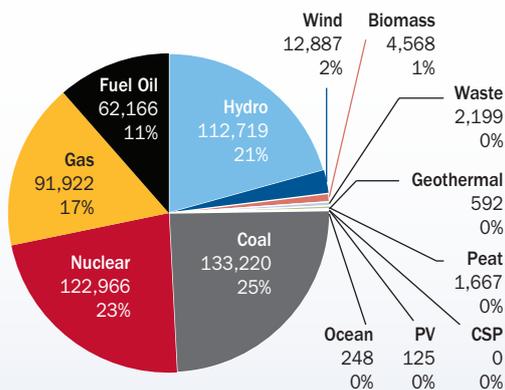
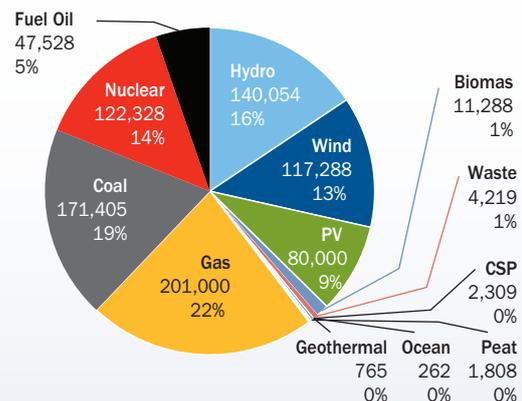


FIGURE 2.4: EU POWER MIX 2013



A closer look at wind power installations

Total installed power capacity

Annual wind power installations in the EU have increased steadily over the past 13 years from 3.2 GW in 2000 to 11 GW in 2013, a compound annual growth rate of over 10%.

FIGURE 3.1: ANNUAL WIND POWER INSTALLATIONS IN EU (GW)

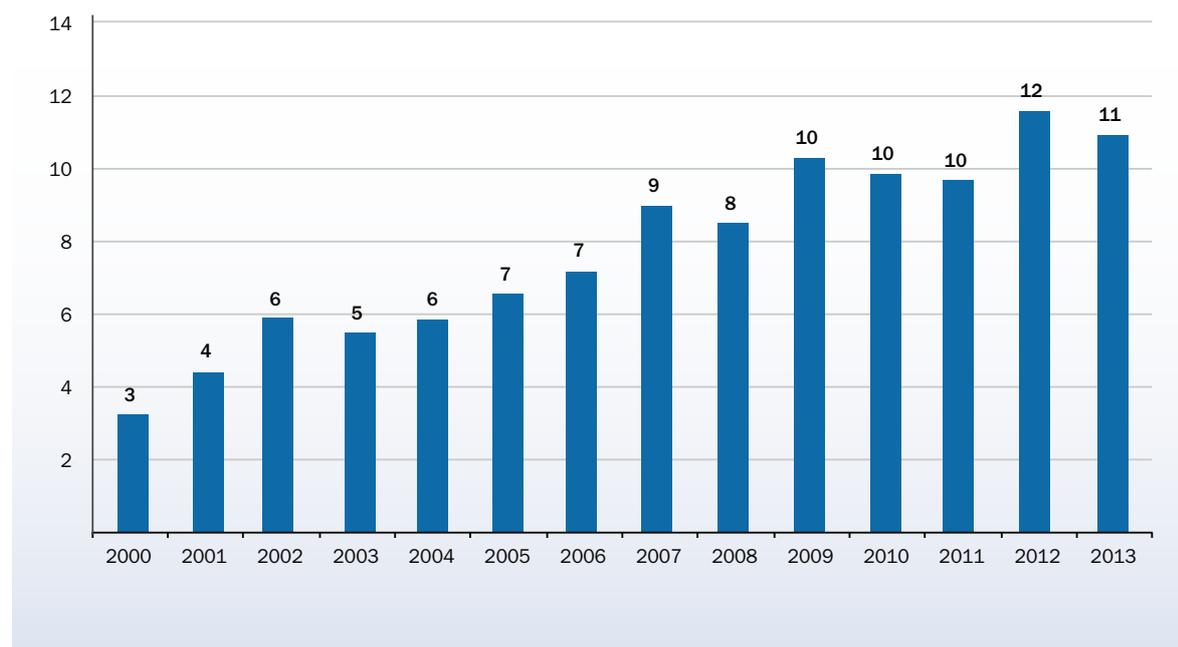


Photo: Joan Sullivan

National breakdown of wind power installations

In 2000, the annual wind power installations of the three pioneering countries – Denmark, Germany and Spain – represented 85% of all EU wind capacity additions. By 2012, they represented only 29% of total installations. In 2013, although the Spanish market contracted significantly compared to the previous year (-84%), the German market grew by 36% and installations in the three pioneering countries together represented 36% of the EU market.

Moreover, in 2000, the countries that make up, today, the 13¹ newer EU Member States, had no wind energy, in 2013, they reached 16% of the EU's total market. However, 90% of those installations were in just two countries, Poland and Romania.

This indicates that the renewables policy instability that has affected numerous countries in the EU is leading to increased concentration of wind energy installation in a handful of countries.

FIGURE 3.2 SHARE OF EU WIND POWER MARKET, PIONEERING COUNTRIES, NEWER MEMBER STATES, AND REST OF EU (GW)

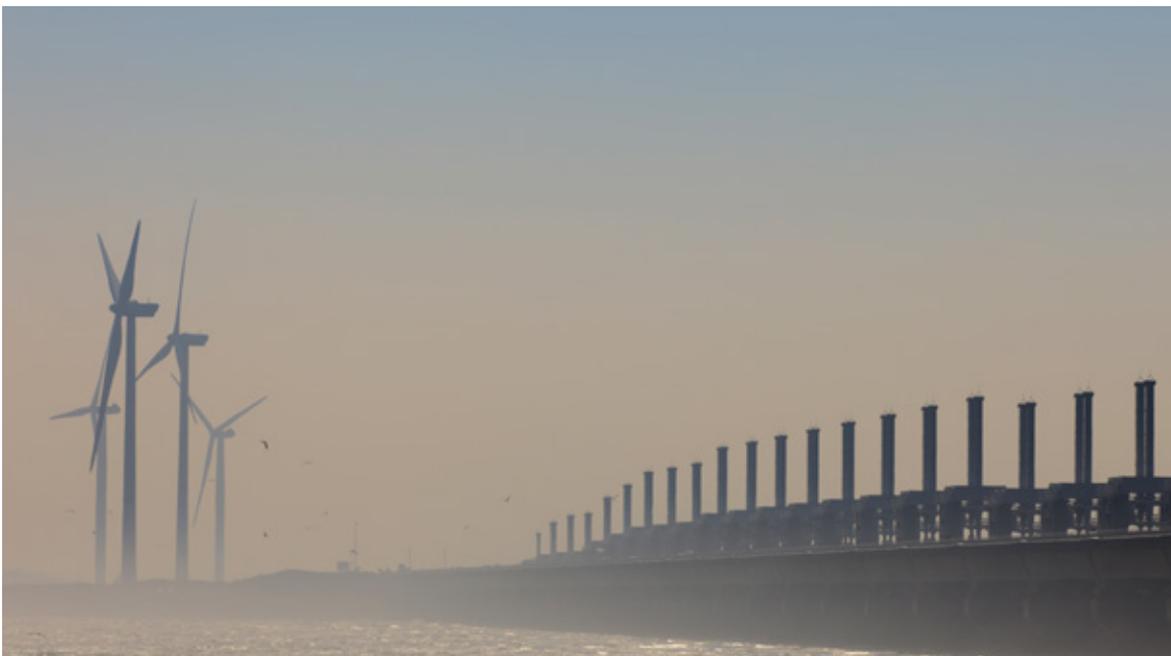
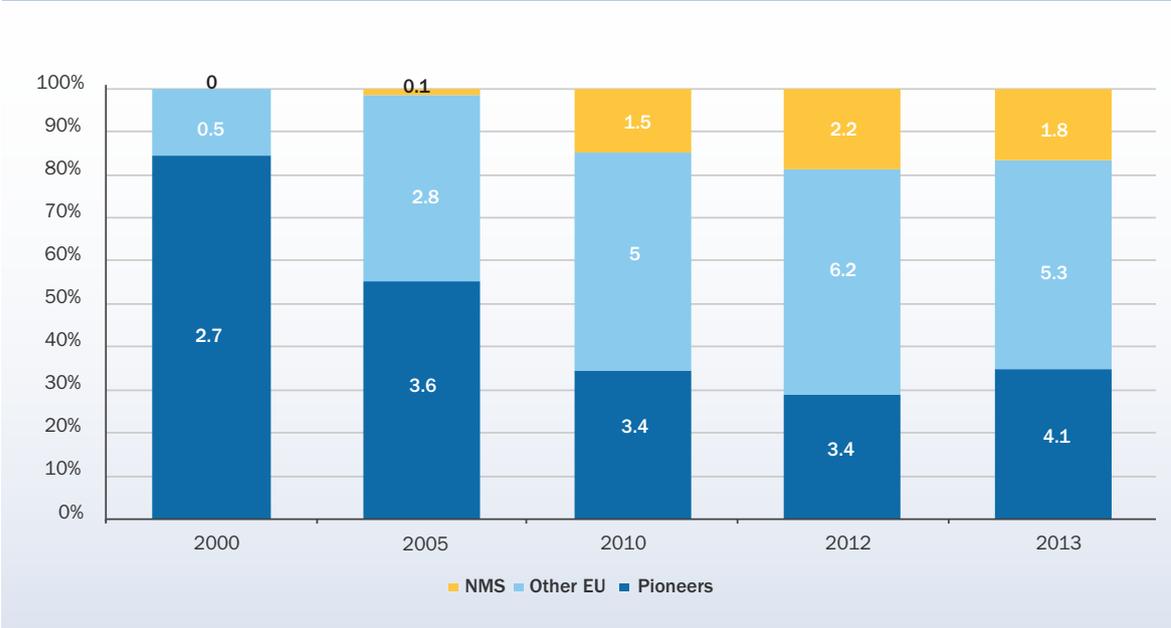


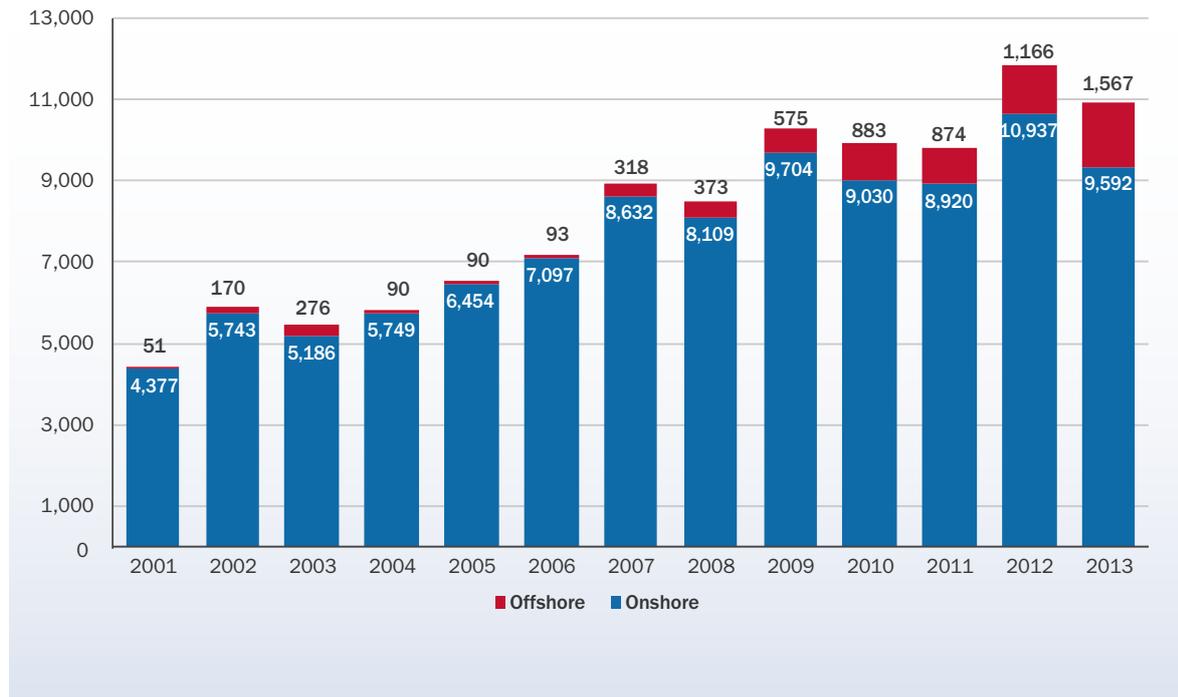
Photo: Arjan de Jager

¹ Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovakia, Slovenia.

Onshore and offshore annual markets

2013 was a record year for offshore installations, with 1,567 MW of new capacity grid connected. Offshore wind power installations represent over 14% of the annual EU wind energy market, up from 10% in 2012.

FIGURE 3.3: ANNUAL ONSHORE AND OFFSHORE INSTALLATIONS (MW)

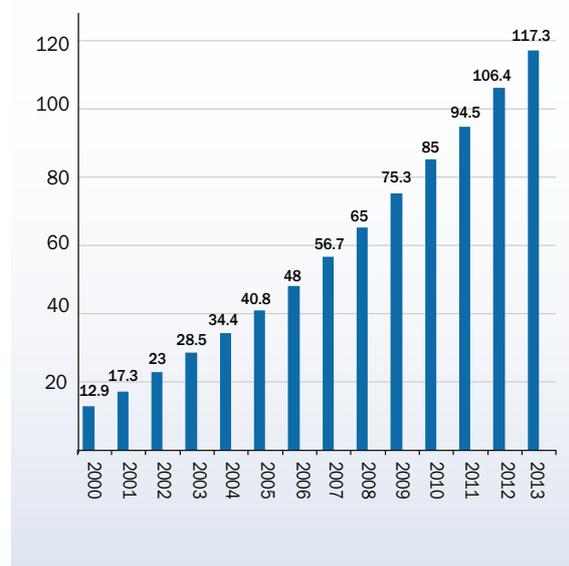


Cumulative wind power installations

A total of 117 GW is now installed in the European Union, a growth of 10% on the previous year and lower to the growth recorded in 2012 (+12% compared to 2011). Germany remains the EU country with the largest installed capacity, followed by Spain, the UK, Italy and France. Eleven other EU countries have over 1 GW of installed capacity: Austria, Belgium, Denmark, France, Greece, Ireland, The Netherlands, Poland, Portugal, Romania and Sweden.

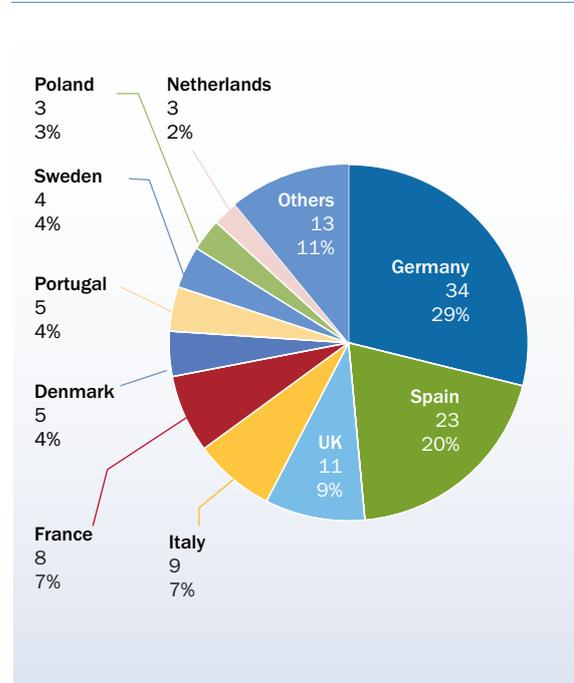
Eight of the latter (Denmark, France, Germany, Italy, Portugal, Spain, Sweden, United Kingdom), have more than 4 GW of installed wind energy capacity.

FIGURE 3.4: CUMULATIVE WIND POWER INSTALLATIONS IN THE EU (GW)



Germany (34.3 GW) and Spain (23 GW) have the largest cumulative installed wind energy capacity in Europe. Together they represent 49% of total EU capacity. The UK, Italy and France follow with, respectively, 10.5 GW (9% of total EU capacity), 8.6 GW (7%) and 8.3 GW (7%). Amongst the newer Member States, Poland, with 3.4 GW (2.9%) of cumulative capacity, is now in the top 10, in front of the Netherlands (2.7 GW, 2%), and Romania is 11th with 2.6 GW (2%).

FIGURE 3.5: EU MEMBER STATE MARKET SHARES FOR TOTAL INSTALLED CAPACITY (TOTAL 118 GW)



Estimated wind energy production

The wind energy capacity currently installed in the EU would produce in an average wind year 257 TWh of

electricity, enough to cover the 8% of the EU's total electricity consumption.

TABLE 1: WIND ENERGY SHARE OF EU ELECTRICITY CONSUMPTION²

Total EU electricity consumption	Onshore wind energy production	Offshore wind energy production	Share of EU consumption met by onshore wind	Share of EU consumption met by offshore wind	Share of EU consumption met by wind
3,280 TWh	233 TWh	24 TWh	7.1%	0.7%	7.8%

² Wind energy penetration levels are calculated using average capacity factors onshore and offshore and Eurostat electricity consumption figures (2011). Consequently, table 1 indicates approximate share of consumption met by the installed wind energy capacity at end 2013. The figure does not represent real wind energy production over a calendar year.

Comparative Life-Cycle Air Emissions of Coal, Domestic Natural Gas, LNG, and SNG for Electricity Generation

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The U.S. Department of Energy (DOE) estimates that in the coming decades the United States' natural gas (NG) demand for electricity generation will increase. Estimates also suggest that NG supply will increasingly come from imported liquefied natural gas (LNG). Additional supplies of NG could come domestically from the production of synthetic natural gas (SNG) via coal gasification–methanation. The objective of this study is to compare greenhouse gas (GHG), SO_x, and NO_x life-cycle emissions of electricity generated with NG/LNG/SNG and coal. This life-cycle comparison of air emissions from different fuels can help us better understand the advantages and disadvantages of using coal versus globally sourced NG for electricity generation. Our estimates suggest that with the current fleet of power plants, a mix of domestic NG, LNG, and SNG would have lower GHG emissions than coal. If advanced technologies with carbon capture and sequestration (CCS) are used, however, coal and a mix of domestic NG, LNG, and SNG would have very similar life-cycle GHG emissions. For SO_x and NO_x we find there are significant emissions in the upstream stages of the NG/LNG life-cycles, which contribute to a larger range in SO_x and NO_x emissions for NG/LNG than for coal and SNG.

1. Introduction

Natural gas currently provides 24% of the energy used by United States homes (1). It is an important feedstock for the chemical and fertilizer industry. Low wellhead gas prices (less than \$3/thousand cubic feet (Mcf) (2)) spurred a surge in construction of natural-gas-fired power plants: between 1992 and 2003, while coal-fired capacity increased only from 309 to 313 GW, natural-gas-fired capacity more than tripled, from 60 to 208 GW (3). Adding to this was the Energy Information Agency's (EIA) prediction of continued low natural gas prices (around \$4/Mcf) through 2020 (4), lower capital costs, shorter construction times, and generally lower air emissions for natural-gas-fired plants that allowed power generators to meet the clean air standards (5). However, instead of remaining near projected levels, the average

wellhead price of natural gas peaked at \$11/Mcf in October 2005 (6). This price increase made natural gas uneconomical as a feedstock, so most natural-gas-fired plants are operating below capacity (7). Despite these trends, natural gas consumption is expected to increase by 20% of 2003 levels by 2030. Demand from electricity generators is projected to grow the fastest. At the same time, natural gas production in the United States and pipeline imports from Canada and Mexico are expected to remain fairly constant (8). The gap between North American supply and U.S. demand can only be met with alternative sources of natural gas, such as imported liquefied natural gas (LNG) or synthetic natural gas (SNG) produced from coal. Current projections by EIA estimate that LNG imports will increase to 16% of the total U.S. natural gas supply by 2030 (8). Alternatively, Rosenberg et al. call for congress to promote gasification technologies that use coal to produce SNG. This National Gasification Strategy calls for the United States to produce 1.5 trillion cubic feet (tcf) of synthetic natural gas per year within the next 10 years (7), equivalent to 5% of expected 2030 demand.

The natural gas system is one of the largest sources of greenhouse gas emissions in the United States, generating around 132 million tons of CO₂ equivalents annually (1). Significant emissions of criteria air pollutants also come from upstream combustion life-cycle stages of the gas. Emissions from the emerging LNG life-cycle stages or from the production of SNG have not been studied in detail. If larger percentages of the U.S. supply of natural gas will come from these alternative sources, then LNG or SNG supply chain emissions become an important part of understanding overall natural gas life-cycle emissions. Also, comparisons between coal and natural gas that concentrate only on the emissions at the utility plant may not be adequate. The objective of this study is to perform a life-cycle analysis (9, 10) of natural gas, LNG, and SNG. Direct air emissions from the processes during the life-cycle will be considered, as well as air emissions from the combustion of fuels and electricity used to run the process. A comparison with coal life-cycle air emissions will be presented, in order to have a better understanding of the advantages and disadvantages of using coal versus natural gas for electricity generation.

2. Fuel Life-Cycles

The natural gas life-cycle starts with the production of natural gas and ends at the combustion plant. Natural gas is extracted from wells and sent to processing plants where water, carbon dioxide, sulfur, and other hydrocarbons are removed. The produced natural gas then enters the transmission system. The U.S. transmission system also includes some storage of natural gas in underground facilities such as reconditioned depleted gas reservoirs, aquifers, or salt caverns to meet seasonal and/or sudden short-term demand. From the transmission and storage system, some natural gas goes directly to large-scale consumers, like electric power generators, which is modeled here. The rest goes into local distribution systems that deliver it to residential and commercial consumers via low-pressure, small-diameter pipelines.

The use of liquefied natural gas (LNG) adds three additional life-cycle stages to the natural gas life-cycle described above. Natural gas is produced and processed to remove contaminants and transported by pipeline relatively short distances to be liquefied. In the liquefaction process, natural gas is cooled and pressurized (11). Liquefaction plants are generally located in coastal areas of LNG exporting countries and dedicated LNG ocean tankers transport LNG

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to the United States. Upon arriving, the LNG tankers offload their cargo and the LNG is regasified. At this point the regasified LNG enters the U.S. natural gas transmission system.

The coal life-cycle is conceptually simpler than the natural gas life-cycle, consisting of three major steps: coal mining and processing, transportation, and use/combustion.

U.S. coal is produced from surface mines (67%), or underground mines (33%) (1). Mined coal is processed to remove impurities. Coal is then transported from the mines to the consumers via rail (84%), barge (11%), and trucks (5%) (12). More than 90% of the coal used in the United States is used by the electric power sector, which is modeled here (8).

The life-cycle of SNG is a combination of some stages from the coal life-cycle and some stages of the natural gas life-cycle. Coal is mined, processed, and transported, as in the coal life-cycle, to the SNG production plant. At this plant, syngas, a mixture of carbon monoxide (CO) and hydrogen (H₂), is produced by gasification and converted, via methanation, to methane and water. The SNG is then sent to the natural gas transmission system, described above, and on to the electric power generator.

3. Methods for Calculating Life-Cycle Air Emissions

In our study we investigate the life-cycle air emissions from coal, natural gas, LNG, and SNG use. All fossil fuel options are used to produce electricity and combustion emissions are included as a component of the each life-cycle. For GHG, the emissions factors at power plants used are 120 lb CO₂ equiv/MMBtu of natural gas and 205 lb CO₂ equiv/MMBtu of coal. The SO_x and NO_x emissions at power plants are presented in the results section and in the Supporting Information

3.1. Life-Cycle Air Emissions from Natural Gas produced in North America. In 2003, the total consumption of natural gas in the United States was over 27 trillion cubic feet (tcf). Of this, 26.5 tcf were produced in North America (U.S., Canada, and Mexico) (13). According to the Environmental Protection Agency (EPA), 1.07% of the natural gas produced is lost in its production, processing, transmission, and storage (14). Total methane emissions were calculated using the percentage of natural gas lost. It was also assumed that natural gas has an average heat content of 1030 Btu/ft³ (13), and that 96% of the natural gas lost is methane, which has a density of 0.0424 lb/ft³ (14).

In 1993 the U.S. EPA established the Natural Gas STAR program to reduce methane emissions from the natural gas industry. Data from this program for the reductions in methane lost in the natural gas system, as described in the Supporting Information, were combined with the data described above to develop a range of methane emissions factors for the North American natural gas life-cycle stages.

Carbon dioxide emissions are produced from the combustion of natural gas used during various life-cycle stages and from the production of electricity consumed during transport. EIA provides annual estimates of the amount of natural gas used for the production, processing, and transport of natural gas. In 2003, approximately 1900 billion cubic feet of natural gas were consumed during these stages of the natural gas life-cycle (13). Total carbon dioxide emissions were calculated using a carbon content in natural gas of 31.90 lb C/MMBtu and an oxidation fraction of 0.995 (1). According to the Transportation Energy Data Book, 3 billion kWh were used for natural gas pipeline transport in 2003 (15). The average GHG emission factor from the generation of this electricity is 1400 lb CO₂ equiv/MWh (16). These CO₂ emissions were added to methane emissions to obtain the upstream combustion GHG emission factors for North American natural gas.

SO_x and NO_x emissions from the natural gas upstream stages of the life-cycle come from the combustion of the fuels used to produce the energy that runs the system, as given in the Supporting Information. Total emissions from flared gas were calculated using the AP 42 Emission Factors for natural gas boilers (17). A range of emissions from the combustion of the natural gas used during the upstream stages of the life-cycle was developed using the AP 42 Emissions Factors for reciprocating engines and for natural gas turbines (17). Emissions from generating the electricity used during natural gas pipeline operations were estimated using the most current average emission factors given by EGRID: 6.04 lb SO₂/MWh and 2.96 lb NO_x/MWh (16). Note that EGRID reports emissions of SO₂ only. Other references used in this paper report total SO_x emission. For this paper, sulfur emission will be reported in terms of SO_x emissions.

In addition to emissions from the energy used during the life-cycle of natural gas, SO_x emissions are produced in the processing stage of the life-cycle, when hydrogen sulfide (H₂S) is removed from the sour natural gas to meet pipeline requirements. A range of SO_x emissions from this processing of natural gas was developed using the AP 42 emissions factors for natural gas processing and for sulfur recovery (17). To use the AP 42 emission factors for sulfur recovery, we found that in 2003 1945 thousand tons of sulfur were recovered from 14.7 trillion cubic feet of natural gas resulting in a calculated average natural gas H₂S mole percentage of 0.0226. This was then used with the AP 42 emission factors for natural gas processing.

3.2. Air Emissions from the LNG Life-Cycle. In 2003, 500 billion cubic feet of natural gas were imported in the form of LNG (13). In 2003, 75% of the LNG imported to the United States came from Trinidad and Tobago, but this percentage is expected to decrease as more imports come from Russia, the Middle East, and Southeast Asia (13). According to EIA, the LNG tanker world fleet capacity should have reached 890 million cubic feet of liquid (equivalent to 527 billion cubic feet of natural gas) by the end of 2006 (18). There are currently 5 LNG terminals in operation in the United States, with a combined base load capacity of 5.3 billion cubic feet per day (about 2 trillion cubic feet per year). In addition to these terminals, there are 45 proposed facilities in North America, 18 of which have already been approved by the Federal Energy Regulatory Commission (FERC) (19).

Due to unavailability of data for emissions from natural gas production in other countries, it is assumed that natural gas imported to the United States in the form of LNG produces the same emissions from the production and processing life-cycle stages as North American natural gas. Those stages are incorporated for LNG. Most of the natural gas converted to LNG is produced from modern fields developed and operated by multinational oil and gas companies, so they are assumed to be operated in a similar way to those in the United States.

It is expected that transportation of natural gas from the production field to the liquefaction plant would have emissions similar to those of pipeline transport of domestic natural gas. But the emission factor for the U.S. system (which is included in the LNG life-cycle) is based on total pipeline distances of over 200 000 miles (20). Because LNG facilities are closely paired with gas fields, it is expected that the average distance from production field to a LNG facility would be much smaller than 200 000 miles. Also, because there were no reliable data for the myriad of fields and facilities and suspected impact on the overall life cycle would be minimal, this transport from the fields to the liquefaction terminals was ignored. This would slightly underestimate the emissions from the LNG life cycle.

Additional emission factors were developed for the liquefaction, transport, and regasification life-cycle stages of LNG. Tamura et al. have reported emission factors for the

liquefaction stage in the range of 11–31 lb CO₂ equiv/MMBtu (21). The sources of these emissions are outlined in the Supporting Information.

LNG is shipped to the United States via LNG tankers. LNG tankers are the last ship type to use steam turbine technology in their engines. This technology allows for easy use of boil-off gas (BOG) in a gas boiler. Boil-off rates in LNG tankers range between 0.15% and 0.25% per day when loaded (22, 23). When there is not enough BOG available, a fuel oil boiler is used to produce the steam. In addition to this benefit, steam turbines require less maintenance than diesel engines, which is beneficial to these tankers that have to be readily available to leave a terminal in case of emergency (22).

Most LNG tankers currently in operation have a capacity to carry between 4.2 and 5.3 million cubic feet of LNG (2.6 and 3.2 billion cubic feet of gas). There are smaller tankers available, but they are not widely used for transoceanic transport. There is also discussion about building larger tankers (8.8 million cubic feet), however none of the current U.S. terminals can handle tankers of this size (18).

The rated power of the LNG tankers ranges between 20 and 30 MW, and they operate under this capacity around 75% of the time during a trip (24, 25). The energy required to power this engine is 11.6 MMBtu/MWh (26). As previously mentioned, some of this energy is provided by BOG and the rest is provided by fuel oil. A loaded tanker with a rated power of 20 MW, and 0.12% daily boil-off rate would consume 3.88 million cubic feet of gas per day and 4.4 tons of fuel oil per day. The same tanker would consume 115 tons of fuel oil per day on they way back to the exporting country operating under ballast conditions. A loaded tanker with a rated power of 30 MW, and a 0.25% daily boil-off rate would get all its energy from the BOG, with some excess gas being combusted to reduce risks of explosion (22). Under ballast conditions, the same tanker would consume 172 tons of fuel oil per day.

For LNG imported in 2003 the average travel distance to the Everett, MA LNG terminal was 2700 nautical miles (13, 27). In the future LNG could travel as far as 11 700 nautical miles (the distance between Australia and the Lake Charles, LA LNG terminal (27)). This range of distances is representative of distances from LNG countries to U.S. terminals that could be located on either the East or West coasts. To estimate the number of days LNG would travel (at a tanker speed of 20 knots (22)), these distances were used. This trip length can then be multiplied by the fuel consumption of the tanker to estimate total trip fuel consumption and emissions, and these can then be divided by the average tanker capacity to obtain a range of emission factors for LNG tanker transport between 2 and 17 lb CO₂ equiv/MMBtu.

Regasification emissions were reported by Tamura et al. to be 0.85 lb CO₂ equiv/MMBtu (21). Ruether et al. report an emission factor of 3.75 lb of CO₂ equiv/MMBtu for this stage of the LNG life-cycle by assuming that 3% of the gas is used to run the regasification equipment (28). The emission reported by Tamura et al. differs because they assumed only 0.15% of the gas is used to run the regasification terminal, while electricity, which may be generated with cleaner energy sources, provides the additional energy requirements. These values were used as lower and upper bounds of the range of emissions from regasification of LNG.

As done for the carbon emissions, natural gas produced in other countries and imported to the United States in the form of LNG is assumed to have the same SO_x and NO_x emissions in the production, processing, and transmission stages of the life-cycle as for natural gas produced in North America. Emission ranges for the liquefaction and regasification of natural gas were calculated using the AP 42 emission factors for reciprocating engines and natural gas turbines (17). It is assumed that 8.8% of natural gas is used in the

liquefaction plant (21) and 3% is used in the regasification plants (28). Emissions of SO_x and NO_x from transporting the LNG via tanker were calculated using the AP 42 emission factor for natural gas boilers and diesel boilers, as well as the tanker fuel consumption previously described.

3.3. Air Emissions from the Coal Life-Cycle. Greenhouse gas emissions from the mining life-cycle stage were developed from methane releases and from combustion of fuels used at the mines. EPA estimates that methane emissions from coal mines in 1997 were 75 million tons of CO₂ equivalents, of which 63 million tons came from underground mines and 12 million tons came from surface mines (1). CO₂ is also emitted from mines through the combustion of the fuels that provide the energy for operation. The U.S. Census Bureau provides fuel consumption data for mines in 1997 (29). These data are available in the Supporting Information. Fuel consumption data were converted to GHG emissions using the carbon content and heat content of each fuel and an oxidation fraction given in EPA's Inventory of U.S. Greenhouse Gas Emissions Sources and Sinks (1) (see Supporting Information). Emissions from the generation of the electricity consumed were calculated using an average 1997 emission factor of 1400 lb CO₂ equiv/MWh (16). These total emissions were then converted to an emission factor using the amount of coal produced in 1997 and the average heat content of this coal.

Emissions from the transportation of coal were calculated using the EIO-LCA tool developed at Carnegie Mellon University (30). To use this tool, economic values for coal transportation were needed. In 1997, the latest year for which the EIO-LCA tool has data, 84% of coal was transported via rail, 11% via barge, and 5% via truck. The cost for rail transport, barge, and truck transport was 13.9, 9.5, and 142.7 mills/ton-mile respectively (12). For a million ton-miles of coal transported, EIO-LCA estimates that 43.6 tons of CO₂ equivalents are emitted from rail transportation, 5.89 tons of CO₂ equivalents from water transportation, and 69 tons of CO₂ equivalents from truck transportation (30). These emissions were then converted to an emission factor by using the average travel distance of coal in each mode (796, 337, and 38 miles by rail, barge, and truck, respectively), the weighted average U.S. coal heat content of 10 520 Btu/lb (31) and the coal production data for 1997 (see Supporting Information).

The energy consumption data used to develop carbon emissions from the mining life-cycle stage were used to develop SO_x and NO_x emission factors for coal. AP 42 emissions factors for off-road vehicles, natural gas turbines, reciprocating engines, light duty gasoline trucks, large stationary diesel engines, and gasoline engines were used to develop this range of emission factors (17, 32). In addition, the average emission factors from electricity generation in 1997 (3.92 lb NO_x/MWh and 7.86 lb SO₂/MWh (16)) were used to include the emissions from the electricity used in mines.

SO_x and NO_x emissions for coal transportation were again calculated using EIO-LCA (30). EIO-LCA estimates that a million ton-miles of coal transported via rail results in emissions of 0.02 tons of SO_x and 0.4 tons of NO_x. A million ton-miles of coal transported via water would emit 0.07 tons of SO_x and 0.36 tons of NO_x. Finally, a million ton-miles of coal transported via truck would emit 0.06 tons of SO_x and 1.42 tons of NO_x (30). These data were added to emissions from mines to find the total SO_x and NO_x emission factors for the upstream stages of the coal life-cycle.

3.4. Air Emissions from the SNG Life-Cycle. Performance characteristics for two SNG plants are given in the Supporting Information. These plants have a higher heating value efficiency between 57% and 60% (33, 34). Using these efficiencies, emissions from coal mining, processing, and

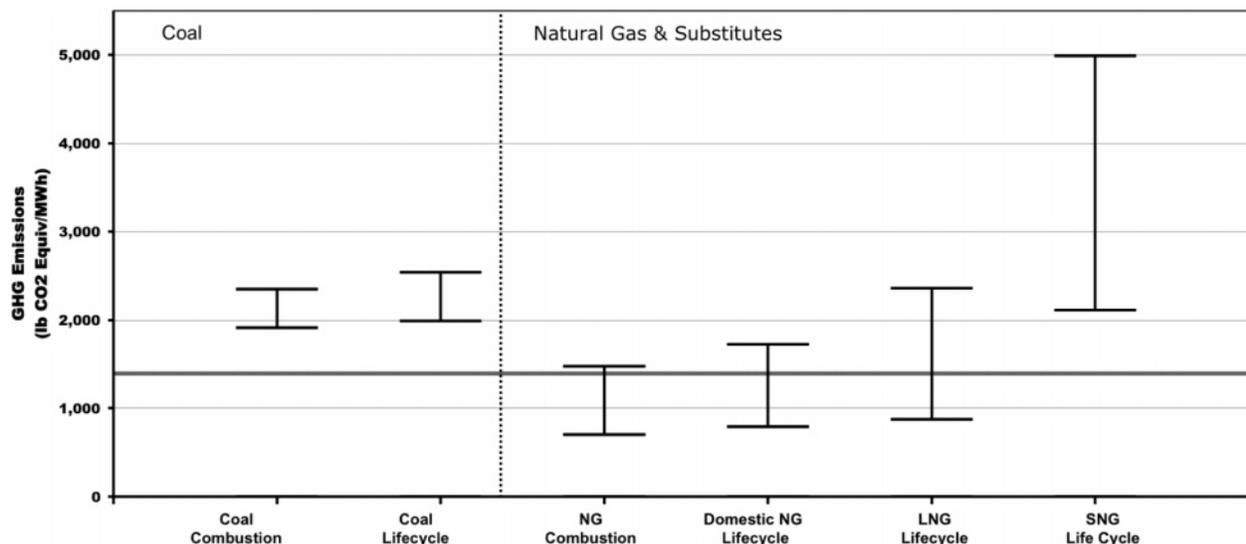


FIGURE 1. Fuel Combustion and Life-Cycle GHG Emissions for Current Power Plants.

transportation previously obtained were converted to pounds of CO₂ equiv/MMBtu of SNG. The data were also used to calculate the emissions at the gasification–methanation plant using a coal carbon content of 0.029 tons/MMBtu and a calculated SNG storage fraction of 37% (1). Finally, the emissions from transmission, storage, distribution, and combustion of SNG are the same as those for all other natural gas.

To develop the SO_x and NO_x emissions from the life-cycle of SNG, the emissions from coal mining and transport developed in the previous section in pounds per MMBtu of coal were converted to pounds per MMBtu of SNG using the efficiencies previously discussed. In addition, the emissions from natural gas transmission and storage were assumed to represent emissions from these life-cycle stages of SNG. The emissions from the gasification–methanation plant were taken from emission data for an Integrated Coal Gasification Combine Cycle (IGCC) plant, which operates with a similar process. Bergerson (35) reports SO_x emissions factors from IGCC between 0.023 and 0.15 lb/MMBtu coal (0.026–0.17 lb/MMBtu of coal if there is carbon capture), and a NO_x emission factor of 0.0226 lb/MMBtu coal (0.0228 lb/MMBtu of coal if there is carbon capture). These were converted to lb/MMBtu of SNG using the same coal-to-SNG efficiencies previously described.

4. Results

4.1. Comparing Fuel Life-Cycle Emissions for Fuels Used at Currently Operating Power Plants. Emission factors for the fuel life-cycles were calculated as pounds of pollutants per MMBtu of fuel produced, as presented in the Supporting Information. Since coal and natural gas power plants have different efficiencies, 1 MMBtu of coal does not generate the same amount of electricity as 1 MMBtu of natural gas/LNG/SNG. For this reason, emission factors given in Table 10S and Table 11S in the Supporting Information were converted to pounds of pollutant per MWh of electricity generated. This conversion is done using the efficiency of natural gas and coal power plants. According to the U.S. Department of Energy (DOE), currently operating coal power plants have efficiencies ranging from 30% to 37%, while currently operating natural gas power plants have efficiencies ranging from 28% to 58% (36). The life-cycle GHG emissions factors of natural gas, LNG, coal, and SNG described in the Supporting Information were converted to a lower and upper bound emission factor from coal and natural gas power plants using these efficiency ranges. Figure 1 shows the final bounds

for the emission factors for each fuel cycle. The life-cycle for each fuel use includes fuel combustion at a power plant. The combustion-only emissions for each fuel are shown for comparison. The solid horizontal line shown represents the current average GHG emission factor for U.S. electricity generation: 1400 lb CO₂ equiv/MWh (16). Note that in this graph no carbon capture and storage (CCS) is performed at any stage of the life-cycle. CCS is a process by which carbon emissions are separated from other combustion products and injected into underground geologic formations such as saline formations or depleted oil/gas fields. A scenario in which CCS is performed at power plants as well as in gasification–methanation plants will be discussed in the following section.

It can be seen that combustion emissions from coal-fired power plants are higher than those from natural gas: the midpoint between the lower and upper bound emission factors for coal combustion is approximately 2100 lb CO₂ equiv/MWh, while the midpoint for natural gas combustions is approximately 1100 lb CO₂ equiv/MWh. This reflects the known environmental advantages from combustion of natural gas over coal. Figure 1 also shows that the life-cycle GHG emissions of electricity generated with coal are dominated by combustion, and adding the upstream life-cycle stages does not change the emission factor significantly, with the midpoint between the lower and upper bound life-cycle emission factors being 2270 lb CO₂ equiv/MWh. For natural-gas-fired power plants the emissions from the upstream stages of the natural gas life-cycle are more significant, especially if the natural gas used is synthetically produced from coal (SNG). The midpoint life-cycle emission factor for domestic natural gas is 1250 lb CO₂ equiv/MWh; for LNG and SNG it is 1600 lb CO₂ equiv/MWh and 3550 lb CO₂ equiv/MWh, respectively. SNG has much higher emission factors than the other fuels because of efficiency losses throughout the system. It is also interesting to note that the range of life-cycle GHG emissions of electricity generated with LNG is significantly closer to the range of emissions from coal than the life-cycle emissions of natural gas produced in North America. The upper bound life-cycle emission factor for LNG is 2400 lb CO₂ equiv/MWh, while the upper bound life-cycle emission factor for coal is 2550 lb CO₂ equiv/MWh.

To compare emissions of SO_x and NO_x from all life-cycles, the upstream emission factors and the power plant efficiencies from the Supporting Information are used. Emissions of these pollutants from coal and natural gas power plants in operation in 2003 were obtained from EGRID (37). Table 1

TABLE 1. SO_x and NO_x Combustion and Life-Cycle Emission Factors for Current Power Plants

fuel	SO _x (lb/MWh)		NO _x (lb/MWh)		
	min	max	min	max	
current electricity mix	6.04		2.96		
coal	combustion	1.54	25.5	2.56	9.08
	life-cycle	1.60	25.8	2.83	9.69
natural gas	combustion	0.00	1.13	0.12	5.20
	life-cycle	0.04	1.49	0.17	9.40
LNG	life-cycle	0.094	2.93	0.25	15.4
SNG	life-cycle	0.30	3.88	0.65	8.08

shows life-cycle emissions for each fuel obtained by adding the combustion emissions from EGRID to the transformed upstream emissions. The current average SO_x and NO_x emission factors for electricity generated in the United States are also shown (16).

It can be seen that coal has significantly larger SO_x emissions than natural gas, LNG, or SNG. This is expected since the sulfur content of coal is much higher than the sulfur content of other fuels. SNG, which is produced from coal, does not have high sulfur emissions because the sulfur from coal must be removed before the methanation process.

For NO_x, it can be seen that the upstream stages of domestic natural gas, LNG, and even SNG make a significant contribution to the total life-cycle emissions. These upstream NO_x emissions come from the combustion of fuels used to run the natural gas system: for domestic natural gas, production is the largest contributor to these emissions; for LNG most NO_x upstream emissions come from the liquefaction plant; finally, for SNG most upstream NO_x emissions come from the gasification–methanation plant.

4.2. Comparing Fuel Life-Cycle Emissions for Fuels Used with Advanced Technologies. According to the DOE, by 2025 65 GW of inefficient facilities will be retired, while 347 GW of new capacity will be installed (8). Advanced pulverized coal (PC), integrated coal gasification combined cycle (IGCC), and natural gas combined cycle (NGCC) power plants could be installed. PC, IGCC, and NGCC plants are generally more efficient (average efficiencies of 39%, 38%, and 50%, respectively (38)) than the current fleet of power plants. In addition, CCS could be performed with these newer technologies. Experts believe that sequestration of 90% of the carbon will be technologically and economically feasible in the next 20 years (5, 38). Having CCS at PC, IGCC, and NGCC plants decreases the efficiency of the plants to average of 30%, 33%, and 43%, respectively (38).

Figure 2 was developed using the revised efficiencies for advanced technologies and the GHG emission factors (in lb/MMBtu) described in the Supporting Information. This figure represents total life-cycle emissions for electricity generated with each fuel. Notice that emissions are shown with and without CCS. In the case of SNG with CCS, capture is performed at both the gasification–methanation plant and at the power plant. The solid horizontal line shown represents the current average GHG emission factor for electricity generation in the United States (1400 lb CO₂ equiv/MWh) (16). The upper and lower bound emissions in this figure are closer together than the upper and lower bounds in Figure 1, because only one power plant efficiency value is used, while for Figure 1 the upper and lower bound efficiency from all currently operating power plants was used (this is especially obvious for the domestic natural gas (NGCC) cases). It can be seen that, in general, life-cycle GHG emissions of electricity generated with the fuels without CCS would decrease slightly compared to emissions from current power plants that use the same fuel (due to efficiency gains). The

most efficient natural gas plant currently in operation, however, could have slightly lower emissions than the lower bound for NGCC, LNGG, and SNGCC, due to efficiency differences. Three of the cases, however (PC, IGCC, and SNGCC), would still have higher emissions than the current average emissions from power plants. If CCS were used, however, there would be a significant reduction in emissions for all cases. In addition the midpoints between upper and lower bound emissions from all fuels are closer together, as can be seen in Figure 3. This figure also shows how the upstream from combustion emissions of fuels become significant contributors to the life-cycle emission factors when CCS is used.

Table 2 was developed using the upstream SO_x and NO_x emission factors obtained in this study and the combustion emissions reported by Bergerson (35) for PC and IGCC plants and by Rubin et al. for NGCC plants (38). These reported combustion emissions can be seen in the Table 12S in the Supporting Information.

As can be seen from Table 2, if advanced technologies are used there could be a significant reduction of NO_x and SO_x emissions, even if CCS is not available. It is interesting also to note that a PC plant with CCS could have lower life-cycle emissions than an IGCC plant with CCS. In the PC case all sulfur is removed through flue gas desulfurization. The removed sulfur compounds are then solidified and disposed of or sold as gypsum. In an IGCC plant with CCS, sulfur is removed from the syngas before combustion. In these plants, however, instead of solidifying the sulfur compounds removed and disposing them, the elemental sulfur is recovered in a process that generates some additional SO_x emissions (35). For NO_x, only LNG has higher life-cycle emissions than the average generated at current power plants.

5. Discussion

Natural gas is an important energy source for the residential, commercial, and industrial sectors. In the 1990s, the surge in demand by electricity generators and relatively constant natural gas production in North America caused prices to increase, so that in 2005 these sectors paid 58 billion dollars more than they would have paid if 2000 prices remained constant. Cumulative additional costs of higher natural gas prices for residential, commercial, and industrial consumers between 2000 and 2005 were calculated to be around 120 billion dollars. LNG has been identified as a source of natural gas that might help reduce prices, but even with an increasing supply of LNG, EIA still projects average delivered natural gas prices above \$6.5/Mcf in the next 25 years. This is higher than the \$4.5/Mcf average projected price in earlier reports before the natural-gas-fired plant construction boom (4).

In addition to LNG, SNG has been proposed as an alternative source to add to the natural gas mix. The decision to follow the path of increased LNG imports or SNG production should be examined in light of more than just economic considerations. In this paper, we analyzed the effects of the additional air emissions from the LNG/SNG life-cycle on the overall emissions from electricity generation in the United States. We found that with current electricity generation technologies, natural gas life-cycle GHG emissions are generally lower than coal life-cycle emissions, even when increased LNG imports are included. However LNG imports decrease the difference between GHG emissions from coal and natural gas. SNG has higher life-cycle GHG emission than coal, domestic natural gas, or LNG. It is also important to note that upstream GHG emissions of NG/LNG/SNG have a higher impact in the total life-cycle emissions than upstream coal emissions. This is a significant point when considering a carbon-constrained future in which combustion emissions are reduced.

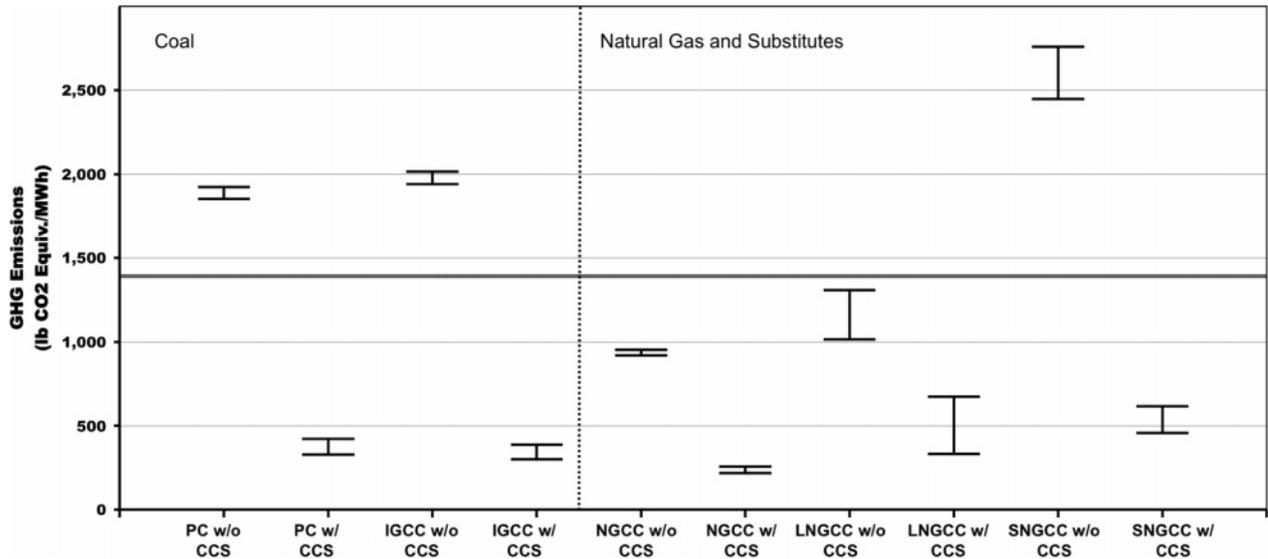


FIGURE 2. Fuel GHG Life-Cycle Emissions Using Advanced Technologies.

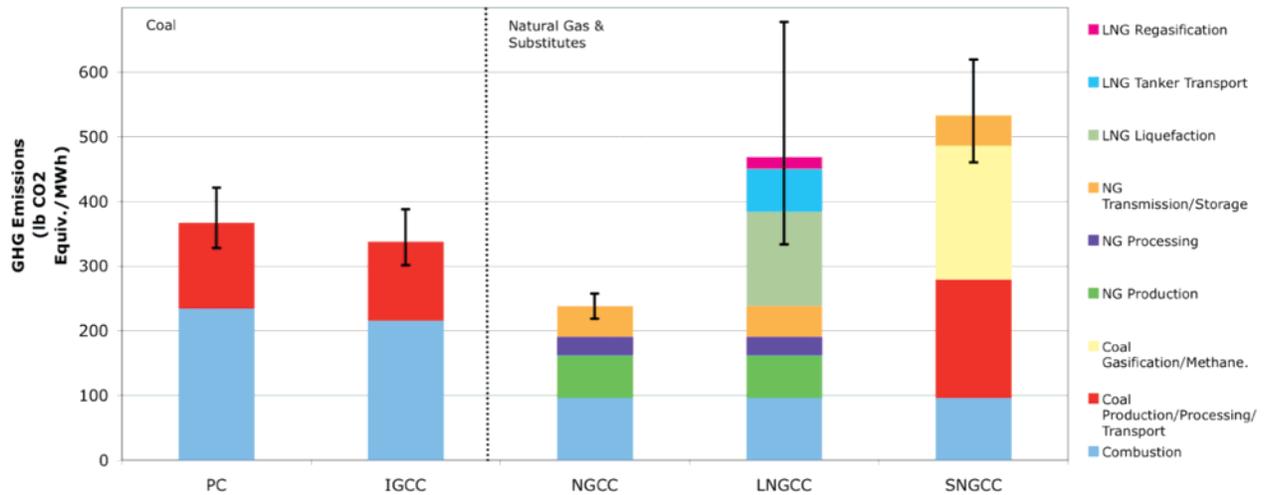


FIGURE 3. Midpoint Life-Cycle GHG Emissions Using Advanced Technologies with CCS.

TABLE 2. SO_x and NO_x Life-Cycle Emission Factors for Advanced Technologies

fuel	SO _x (lb/MWh)		NO _x (lb/MWh)	
	min	max	min	max
current electricity mix	6.04		2.96	
coal				
PC w/o CCS	0.24	1.54	1.42	2.46
PC w/ CCS	0.08	0.34	1.90	3.61
IGCC w/o CCS	0.27	1.57	0.47	0.70
IGCC w/ CCS	0.32	1.83	0.54	0.78
natural gas				
NGCC w/o CCS	0.04	0.20	0.30	2.57
NGCC w/ CCS	0.05	0.24	0.36	3.01
LNG				
NGCC w/o CCS	0.25	1.04	0.39	5.89
NGCC w/ CCS	0.30	1.23	0.46	6.91
SNG				
NGCC w/o CCS	0.35	2.15	0.88	1.85
NGCC w/ CCS	0.45	2.80	1.03	2.18

For emissions of SO_x, we found that with current electricity generation technologies, coal has significantly higher life-cycle emissions than any other fuel due to very high emissions at current power plants. For NO_x, however, this pattern is different. We find that with current electricity generation technologies, LNG could have the highest life-cycle NO_x emissions (since emissions from liquefaction and regasification are significant), and that even natural gas produced

in North America could have life-cycle NO_x emissions very similar to those of coal. It is important to note that while GHG emissions contribute to a global problem, SO_x and NO_x are local pollutants and U.S. policy makers may not give much weight to emissions of these pollutants in other countries.

In the future, as newer generation technologies and CCS are installed, the overall life-cycle GHG emissions from electricity generated with coal, domestic natural gas, LNG, or SNG could be similar. Most important is that all fuels with advanced combustion technologies and CCS have lower life-cycle GHG emission factors than the current average emission factor from electricity generation. For SO_x we found that coal and SNG would have the largest life-cycle emissions, but all fuels have lower life-cycle SO_x emissions than the current average emissions from electricity generation. For NO_x, LNG would have the highest life-cycle emissions and would be the only fuel that could have higher emissions than the current average emission factor from electricity generation, even with advanced power plant design.

We suggest that advanced technologies are important and should be taken into account when examining the possibility of doing major investments in LNG or SNG infrastructure. Power generators hope that the price of natural gas will decrease as alternative sources of natural gas are added to the U.S. mix, so they can recover the investment made in

natural gas plants that are currently producing well under capacity. We suggest that these investments should be viewed as sunk costs. Thus, it is important to re-evaluate whether investing billions of dollars in LNG/SNG infrastructure will lock us into an undesirable energy path that could make future energy decisions costlier than ever expected and increase the environmental burden from our energy infrastructure.

Acknowledgments

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Supporting Information Available

Graphical representation of the fuel life-cycles, emissions calculation information, summary of emissions from fuel life-cycles, power plant efficiency information, emissions from advanced technologies, and references, This material is available free of charge via the Internet at <http://pubs.acs.org>.

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Comparative Life-cycle Air Emissions of Coal, Domestic Natural Gas, LNG, and SNG for Electricity Generation

Supporting Information

1. Graphical Representation of the Fuel Life-cycles

Figure 1S and Figure 2S below, show the life-cycle stages on natural gas used by electric power generators, including the stages from the LNG life-cycle. Notice that local distribution of natural gas falls outside our analysis boundary.



Figure 1S: Domestic Natural Gas Life-cycle.

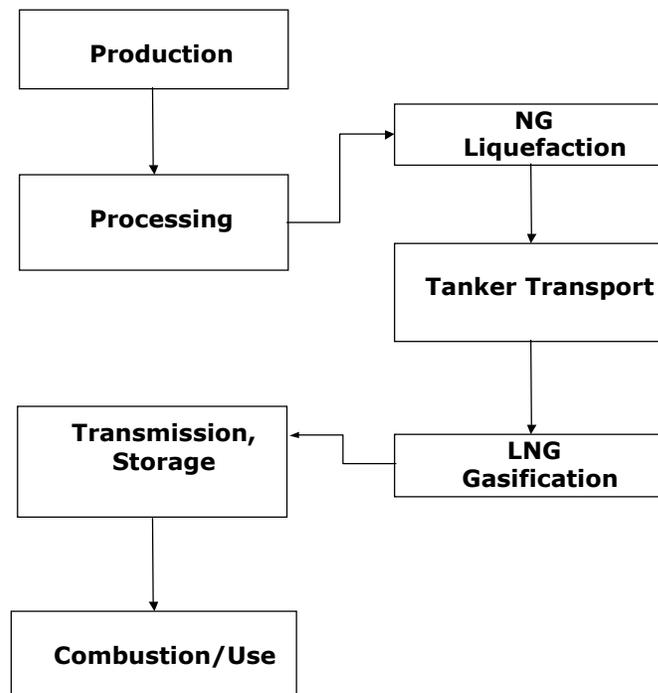


Figure 2S: LNG Life-cycle.

Figure 3S and Figure 4S show the life-cycle of coal and synthetic natural gas (SNG) derived from coal.



Figure 3S: Coal Life-cycle.

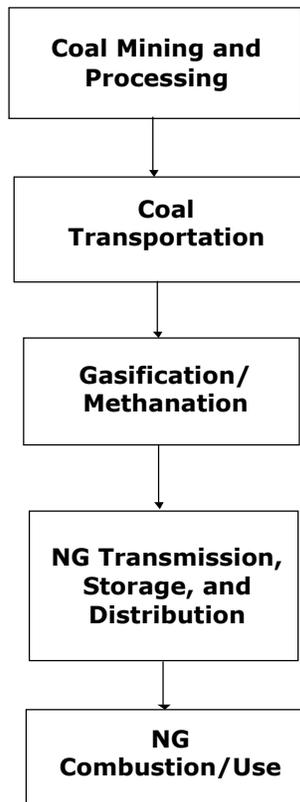


Figure 4S: SNG Life-cycle.

2. Calculating Emissions from the Domestic Natural Gas Life-cycle

During the late 1980s and early 1990s the U.S. Environmental Protection Agency (EPA) conducted a study to determine methane emissions from the natural gas industry (1). This comprehensive study developed hundreds of activity and emissions factors from all areas of the natural gas industry. These factors were developed using data collected from

different sectors of the industry as well as from data collected in field measurements. Methane emissions from the U.S. natural gas system given as a percentage of natural gas produced can be seen in Table 1S. This data was used to develop methane emission factors, as described in the main document. Notice, that Table 1S includes an estimate for natural gas losses in the local distribution system. This estimate is given here for reference, but it was not included in our calculation of emissions of natural gas used to generate electricity.

In addition data from the EPA Natural Gas STAR program was used. The program is a voluntary partnership with the goal of encouraging the natural gas industry to adopt practices that increase efficiency and reduce emissions (for example by reducing natural gas leaks in the pipeline system). Consequently, since 1993, a cumulative total of 338 billion cubic feet of methane emissions have been eliminated. In 2003 alone, 52,900 million cubic feet of methane emissions were eliminated, a 9% reduction over projected emissions for that year without improved practices (2).

Table 1S: Methane Emissions from North American Gas Life-cycle as a Percentage of Natural Gas Produced (1).

Lifecycle Segment	Emissions as a Percentage of Gas Produced
Production	0.38%
Processing	0.16%
Transmission and Storage	0.53%
Distribution	0.35%

Carbon dioxide emissions from the different natural gas life-cycle stages were also calculated. These emissions were calculated using data on the amount of natural gas used to run the processes, as given in Table 2S, as well as an estimated 3 billion KWh of electricity used for pipeline transport. These data were also used to calculate SO_x and NO_x emissions from the life-cycle, as described in the main document. It should be mentioned that the pipeline fuel presented in Table 2S includes fuel used by the transmission system and the local distribution system. As previously described, natural gas used by electricity generators is bought directly from the transmission system, so that emissions from the distribution system are not included in our analysis. Due to data limitations, we were not able to disaggregate pipeline fuel and electricity consumption between the two systems. To deal with this issue, we use a range of emissions. The minimum value assumes that none of this fuel is consumed in the transmission system and the maximum value assumes that all is consumed in the transmission system.

Table 2S: Natural Gas Used During the Natural Gas Life-cycle. (3).

Use (as defined by EIA)	NG Life-cycle Stage	Amount (million ft ³)
Flared Gas	Production	98,000
Lease Fuel	Production	760,000
Pipeline Use	Transmission/Distribution	665,000
Plant Fuel	Processing	365,000

3. Calculating Emissions from the LNG Life-cycle

As mentioned in the main paper, Tamura et al (4) provide GHG emissions for liquefaction plants. Table 3S presents the sources of these emissions.

Table 3S: Liquefaction Emission Factors (Adapted from Tamura et al (4)).

Liquefaction	Emission Factors (lb CO ₂ Equivalent/MMBtu)		
	Minimum	Average	Maximum
CO ₂ from fuel combustion	11	12	13
CO ₂ from flare combustion	0.00	0.77	1.5
CH ₄ from vent	0.09	1.3	9.8
CO ₂ in raw gas	0.09	4.0	6.6

Table 4S provides the distance from LNG exporting countries to two U.S. LNG terminals and the amount of LNG brought from each country in 2003. These two terminals were chosen because they are two of the largest terminals in the United States and they represent longest and shortest tanker travel distances for which route information is available. In addition, the range of distances provided is also representative of distances LNG would have to travel if a LNG terminal was located in the U.S. West Coast. Figure 5S shows the emission factors for LNG Tanker transport from each country to each of these terminals, obtained using the tanker information given in the main document. Emissions from tanker transport range between 2 and 17 pounds of CO₂ Equivalent per MMBtu of natural gas. These data was also used to calculate the SO_x and NO_x emission factors for tanker transport.

Table 4S: LNG Exporting Countries in 2003.

Exporting Country	Distance to Lake Charles Facility (nautical miles) (5)	Distance to Everett, MA Facility (nautical miles) (5)	2003 US Imports (million cubic feet NG) (3)
Algeria	5,000	3,300	53,000
Australia	12,000	11,000	0
Brunei	12,000	11,000	0
Indonesia	12,000	11,000	0
Malaysia	12,000	11,000	2,700
Nigeria	6,100	5,000	50,000
Oman	8,900	7,500	8,600
Qatar	9,700	8,000	14,000
Trinidad	2,200	2,000	380,000
UAE	9,600	7,959	0
Russia	9,600	11,000	0

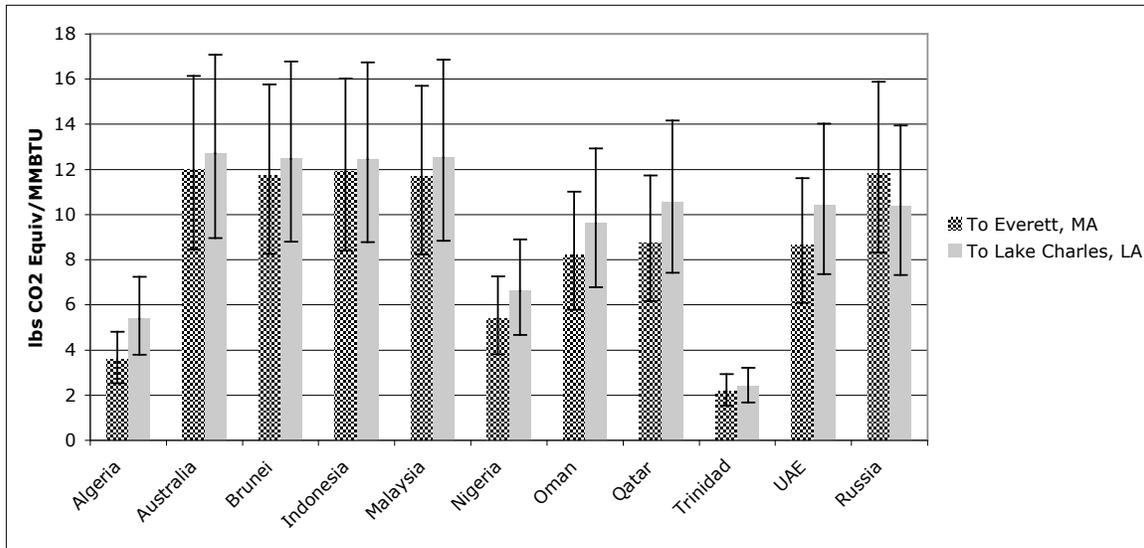


Figure 5S: Tanker Emission Factors from Each Country.

4. Calculating Emissions from the Coal Life-cycle

Table 5S presents fuel consumption data for coal mines in the U.S., and Table 6S presents carbon content, heat content of these fuels. These data was used to calculate GHG emissions factors for coal mines.

Table 5S: 1997 Fuel Consumption at Coal Mines (6)

Mine Type	Fuel Oil (1000 bbl)			Gas (10 ⁹ ft ³)	Gasoline (10 ⁶ gal)	Electricity (10 ⁶ KWh)
	Total	Distillate	Residual			
Surface	8,280	7,524	756	0.7	30	42,474
Underground	801	656	145	0.5	4	7,123

Table 6S: Carbon Content, and Heat Content of Different Fuels (7).

Fuel Type	Carbon Content of Fuel lb/MMBtu Fuel	Heat Content of Fuel (MMBtu/bbl - MMBtu/MMcf)	Fraction Oxidized
Distillate	43.98	5.825	0.99
Residual	47.38	6.287	0.99
Gas	31.90	1,030	0.995
Gasoline	42.66	5.253	0.99

Table 7S: 1997 Coal Production Data (8).

Mine Type	Coal Produced (1000 tons)	Heat Content of Coal (BTU/lb)
Surface	669,273	9,626
Underground	420,657	11,944
Total	1,089,930	10,520

As described in the main document, EIO-LCA was used to estimate emission factors from coal transportation. Table 8S summarizes the emissions resulting from transporting one million ton-miles of coal via each transportation mode.

Table 8S: EIO-LCA GHG Emission Data for a Million Ton-Miles of Coal Transported (9).

Sector	Total GHG Emissions (tons CO ₂ Equivalent)	Total SO _x Emissions (tons SO _x)	Total NO _x Emissions (tons NO _x)
Rail Transportation	43.6	0.02	0.40
Water Transportation	5.89	0.07	0.36
Truck Transportation	69.0	0.06	1.42

5. Calculating Emissions from the SNG Life-cycle

In order to calculate air emissions from the SNG life-cycle, the emissions from coal production, processing and transport were converted from pounds per MMBtu of coal used to pounds per MMBtu of SNG produced using the performance characteristics of two SNG plants given in Table 9S. The emissions from SNG transport, storage and use are the same as those from natural gas. The efficiency for the CCS case was obtained assuming an energy penalty of 16% as described for and IGCC plant by Rubin et al (10).

Table 9S: SNG Plant Performance Characteristics

	Case 1 (11)	Case 2 (12)
SNG Output (1. mcf/day and 2. MMBtu/hr)	250	1,739
Efficiency without CCS (HHV)	57%	60%
Efficiency with CCS (HHV)	50%	52%

6. Summary of Emissions from Fuel Life-cycles

Table 10S summarizes GHG emission factors for all fuels. The emission factors presented in this section are the average emission rate relative to units of fuel produced, without considering the efficiency of using these fuels. These emission factors can later be used to develop total inventories of GHG emissions from the annual consumption of each fuel. Allocation of these emissions for each life-cycle stage can be seen in Figure 6S through Figure 8S. Note that there are two different emission factors for SNG. In one case, no carbon capture and sequestration (CCS) is performed at the gasification-methanation stage. When CCS is performed at the gasification-methanation plant, an energy penalty is incurred. It was assumed that the energy penalty observed at IGCC plants with CCS (16%) is representative of the energy penalty at the SNG gasification-methanation plant (10). CCS could also be performed at power plants, as discussed in the main document.

It is also very important to note that the emission factors shown in Table 10S (and the emission factors given in Table 11S) are not comparable to each other, since one Btu of coal does not generate the same amount of electricity as one Btu of natural gas or SNG. These emission factors can be transformed to comparable units, namely lbs/MWh of electricity produced, by taking into consideration the efficiency of electricity generation.

**Table 10S: Life-cycle GHG Emission Factors
(units: lbs/MMBtu of Fuel Produced)**

Life-cycle Stages	North American NG		LNG		Coal		SNG (No CCS at Gasif./Methan. Plant)		SNG (CCS at Gasif./Methan. Plant)	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
Upstream	15.3	20.1	29.6	72.3	8.2	16.4	240	286	45.2	65.2
Combustion (no CCS)	120	120	120	120	205	205	120	120	120	120
Combustion (with CCS)	12	12	12	12	20.5	20.5	12	12	12	12

SO_x and NO_x emission factors for the upstream stages of electricity generation for the fuel life-cycles can be seen in Table 11S. SO_x and NO_x emissions from the combustion of fuel at power plants are very dependent on specific plant characteristics, so it was not possible to transform these power plant emissions (given in lbs/MWh) to the same units as the emissions from the upstream stages of the life-cycle (lbs/MMBtu) by simply using the efficiency of the power plants.

Table 11S: Upstream SO_x and NO_x Emission Factors (units: lbs/MMBtu of Fuel Produced)

Pollutant	North American Natural Gas		LNG		Coal		SNG (No CCS at Gasif./Methan. Plant)		SNG (CCS at Gasif./Methan. Plant)	
	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
SO _x	0.006	0.030	0.016	0.145	0.007	0.029	0.051	0.316	0.064	0.400
NO _x	0.009	0.342	0.022	0.831	0.030	0.535	0.090	0.234	0.104	0.253

7. GHG Emissions Allocated to Fuel Life-cycle Stages

Figure 6S through Figure 8S show how the GHG emissions reported in Table 10S are allocated among the different life-cycle stages.

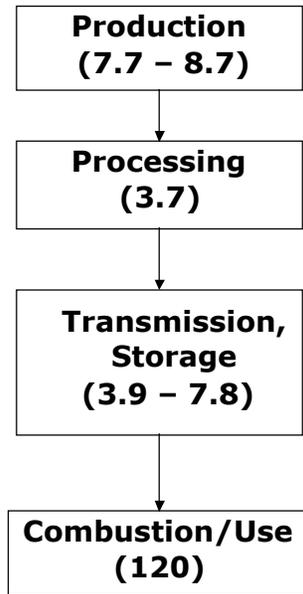


Figure 6S: North American Gas Life-cycle GHG Emission Factors (Units: lbs CO₂ Equivalent/MMBtu).

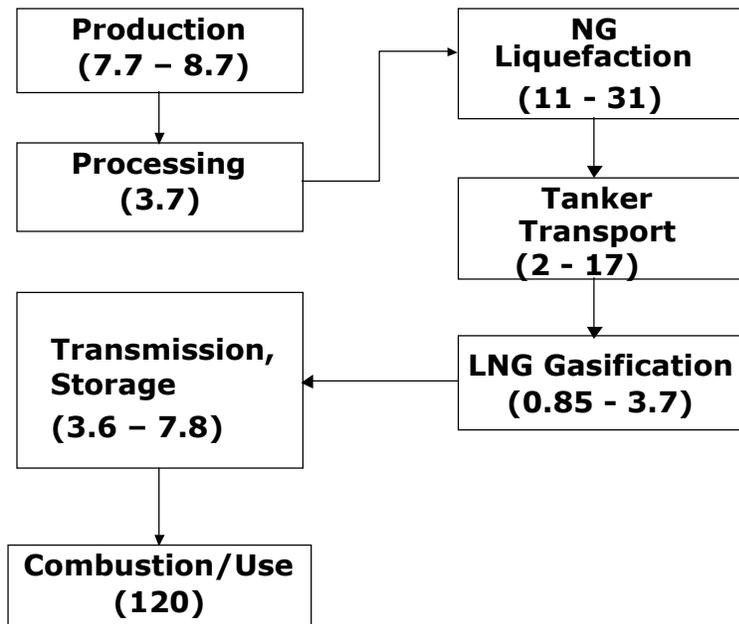


Figure 7S: LNG Life-cycle GHG Emission Factors (Units: lbs CO₂ Equivalent/MMBtu).

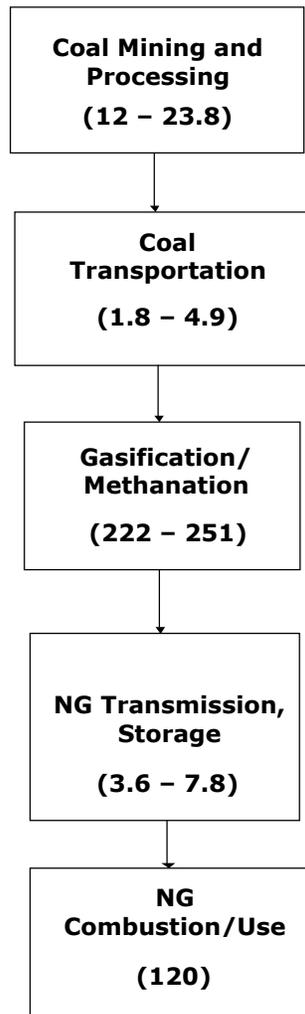


Figure 8S: SNG Life-cycle GHG Emission Factors (Units: lbs CO₂ Equivalent/MMBtu).

8. Efficiencies of Currently Operating Power Plants

Figure 9S shows the distribution of the efficiencies of currently operating power plants, obtained using the cumulative distribution function of EIA 2003 electricity generation data for all utility plants (13). As illustrated in Figure 9S, the median efficiency for natural gas plants is higher than the median efficiency for coal plants. These efficiencies were used to convert the emission factors previously presented (in lbs/ MMBtu of fuel) to lbs/MWh.

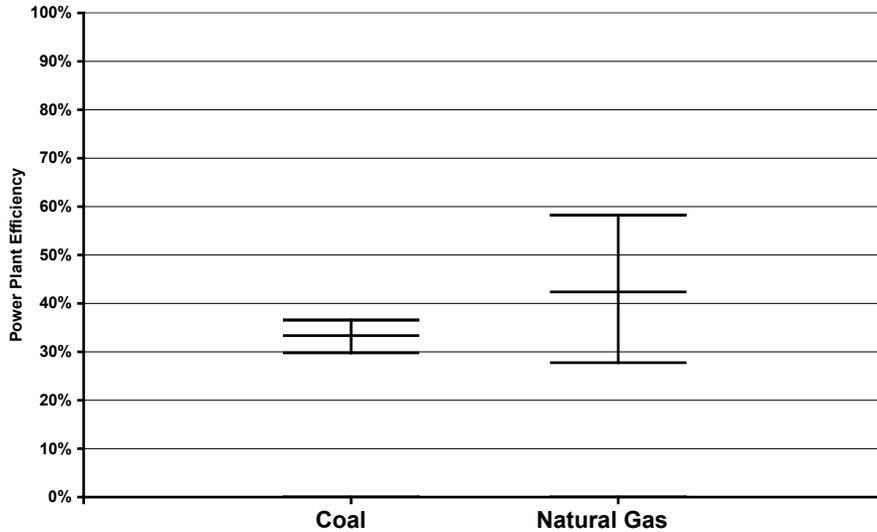


Figure 9S: Efficiencies of Natural Gas and Coal Plants (13).

9. Combustion Emissions from Advance Technologies

Table 12S reports combustion emissions from advanced power plant technologies. The emission factors from PC and IGCC plants were reported Bergerson (14) for PC and IGCC plants. Rubin et al reported the emissions for NGCC plants (10).

Table 12S: Combustion Emissions from Advanced Power Plants.

Fuel/Pollutant	SO _x (lbs/MWh)		NO _x (lbs/MWh)	
	Min	Max	Min	Max
PC w/o CCS	0.17	1.28	1.16	2.00
PC w/ CCS	0.00	0.01	1.56	3.00
IGCC w/o CCS	0.20	1.30	0.20	0.20
IGCC w/ CCS	0.24	1.52	0.20	0.20
NGCC w/o CCS	0.00	0.00	0.24	0.24
NGCC w/ CCS	0.00	0.00	0.29	0.29

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Comparative Life Cycle Carbon Emissions of LNG Versus Coal and Gas for Electricity Generation

Paulina Jaramillo, W. Michael Griffin, H. Scott Matthews

Introduction

Natural gas currently provides 24% of the energy used by homes and businesses in the US (1). It is also an important feedstock for the chemical and fertilizer industry. In the early 1990's the price of natural gas was low (around \$3/1000 ft³) and as a result there was a surge in construction of natural gas plants (2). Today, the Henry Hub price of natural gas is around \$15/1000 ft³ (3), and most of these plants are operating below capacity. However, natural gas consumption is expected to increase 41% by 2025 (to 30 trillion cubic feet), with demand from electricity generators growing the fastest (increasing 90% by 2025). At the same time natural gas production in North America is expected to remain fairly constant at around 24 trillion cubic feet, so that demand of imported liquefied natural gas (LNG) will increase to around 6 trillion cubic feet or 20% of the total supply by 2025 (3).

The natural gas system is the second largest source of greenhouse gas emissions in the US, generating around 132 million tons of CO₂ Equivalents (1). Several studies have performed emission inventories for the natural gas lifecycle from production to distribution. Usually these analyses have been performed for domestic natural gas, so that emissions from the LNG lifecycle stages have been ignored. If, as the DOE estimates suggest, larger percentages of the supply of natural gas will come from these imports, emissions from these steps in the lifecycle could influence the total natural gas lifecycle emissions. Thus, comparisons between coal and natural gas that concentrate only on the emissions at the utility plant may not be adequate. The objective of this study is to perform an analysis of the natural gas lifecycle greenhouse gas emissions taking the emissions from LNG into consideration. Different scenarios for the percentage of natural gas as LNG are analyzed. Moreover, a comparison with the coal fuel cycle greenhouse gas emissions will be presented, in order to have a better understanding of the advantages and disadvantages of using coal versus natural gas for electricity generation.

The Natural Gas Life Cycle

The natural gas life cycle starts with the production of natural gas and ends at the combustion plant. NaturalGas.org has a very detailed description of this life cycle. Readers are encouraged to visit this website if they need more information about the topic.

Geological surveys and seismic studies are used to determine the location of natural gas deposits. After these sites have been identified, wells are constructed. There are two types of well for the extraction of natural gas: oil wells and natural gas wells. Oil wells are

drilled primarily to extract oil, but natural gas can also be obtained. Natural gas wells are specifically drilled to extract natural gas.

After natural gas is extracted through the wells, it has to be processed to meet the characteristics of the natural gas used by consumers. Consumer natural gas is composed primarily of methane. However, when natural gas is extracted, it exists with other hydrocarbons such as propane and ethane. In addition, the extracted natural gas contains impurities such as water vapor and carbon dioxide that must be removed. Natural gas processing plants are usually constructed in gas producing regions. The natural gas is transported from the extraction sites to these plants through a system of low-diameter, low-pressure pipelines. At the plant, water vapor is first removed from the gas by using absorption or adsorption methods. Glycol Dehydration is an example of absorption, in which glycol, which has a chemical affinity to water, is used to absorb the vapor. Solid-Desiccant Dehydration is an example of adsorption. In this process the natural gas passes through towers that contain activated alumina or other solid desiccants. As the gas is passed through these towers, the water particles are retained on the surface of the solids.

As previously mentioned, natural gas is extracted with other hydrocarbons that must be removed. The removal of these hydrocarbons, called Natural Gas Liquids (NGL), is done with the absorption method or the cryogenic expander process. The absorption method is similar to the water absorption method, but instead of glycol, absorbing oil is used. The cryogenic expansion method consists of dropping the temperatures of the gas causing the hydrocarbons to condense so that they can be separated from the natural gas. The absorption method is used to remove heavier hydrocarbons, while lighter hydrocarbons are removed using the cryogenic expansion process.

The final step in the processing of natural gas is the removal of sulfur and carbon dioxide. Often, natural gas from the wells contains high amounts of these two compounds, and it is called sour gas. Sulfur must be removed from the gas because it is a potentially lethal chemical if breathed. In addition, sour gas can be corrosive for the transmissions and distribution pipelines. The process of removing sulfur and carbon dioxide from the gas is similar to the absorption processes previously described.

After the natural gas is processed it enters the transmission system. In the US, this transmission system is the interstate natural gas pipeline network, which consists of thousands of miles of high-pressure pipelines that transport the gas from producing areas to high demand areas. In addition to the pipes, this pipeline system has compressor stations along the way, usually placed in 40 to 100 mile intervals. These compressor stations use a turbine or an engine to compress the natural gas and maintain the high pressure required in the pipeline. The turbines and engines generally run with a small amount of the gas from the pipeline. In addition to compressor stations, metering stations are also placed along the system to allow companies to better monitor and manage the natural gas in the pipes. Moreover valves can be found through the entire length of the pipelines to regulate flow.

Natural gas can be stored to meet seasonal demand increases or to meet sudden, short-term demand increases. Natural gas is usually stored in underground facilities. Such facilities could be built in reconditioned depleted gas reservoirs, aquifers or salt caverns. According to the Energy Information Administration (EIA), in 2003 the total storage capacity in the United States was 8.2 billion cubic feet. 82% of this capacity was in depleted gas fields, 15% in depleted aquifers, and 3% in salt caverns. Moreover during that year, withdrawals from storage added to 3.1 billion cubic feet while injections totaled 3.3 billion cubic feet (4). It is important to note that some gas injected into underground storage becomes physically unrecoverable gas. This gas is known as base gas.

Distribution is the final step before natural gas is delivered to consumers. Local Distribution Companies transport natural gas from delivery points along the transmission system to local consumers via a low-pressure, small-diameter pipeline system. Natural gas that arrives to a city gate through the transmission system is depressurized, and filtered to remove any moisture or particulate content. In addition, Mercaptan is added to the gas to create the distinctive smell that allows leaks to be detected. Small compressors are used in the distribution system to maintain the pressure required.

When Liquefied Natural Gas (LNG) is added to the mix of natural gas, three additional lifecycle stages are created: liquefaction, tanker transport, and regasification. Figure 1 shows the total life cycle of natural gas including the LNG stages.

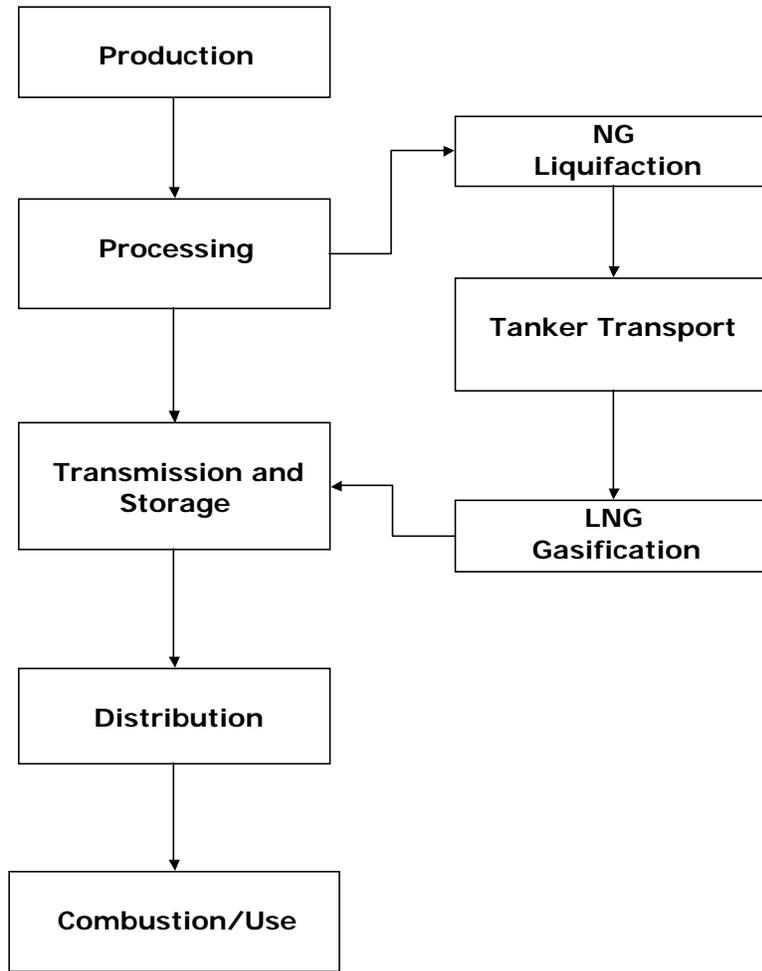


Figure 1: Natural Gas Life Cycle Including LNG.

In the liquefaction process, natural gas is cooled and pressurized to convert it to liquid form, reducing its volume by a factor of 610 (5). These liquefaction plants are generally located in coastal areas of LNG export countries. Currently 75% of the LNG imported to the US comes from Trinidad, but this percentage is expected to decrease as more imports come from Russia, the middle east, and southeast Asia (4). LNG tankers bring this gas to the US. According to EIA, there were 151 LNG tankers in operation worldwide as of October 2003. The majority of these tankers have the capacity to carry more than 120,000 cubic meters of liquefied natural gas (equivalent to 2.59 billion cubic feet of natural gas, enough gas to supply an average of 31,500 residences for a year (4)) and the total fleet capacity is 17.4 million cubic meters of liquid (equivalent to 366 billion cubic feet of natural gas). There are currently fifty-five ships under construction that will increase total fleet capacity to 25.1 million cubic meters of liquid (equivalent to 527 billion cubic feet of natural gas) in 2006 (6).

Regasification facilities are the last step LNG must pass through before going into the US pipeline system. Regasification facilities are LNG marine terminals where LNG tankers unload their gas. These facilities consist of storage tanks and vaporization equipment that warms the LNG to return it to the gaseous state. There are currently 5 LNG terminals in operation in the US: Lake Charles, Louisiana; Elba Island, Georgia; Cove Point, Maryland; Everett, Massachusetts; and a recently opened offshore terminal in the Gulf of Mexico. These terminals have a combined base load capacity of 3.05 billion cubic feet per day (about 1 trillion cubic feet per year). In addition to these there are over fifty proposed facilities for a total proposed capacity of 62 billion cubic feet per day (23 trillion cubic feet per year). Figure 2 shows the proposed location of these facilities (6).

As shown in Figure 1, natural gas combustion is the last stage in the natural gas lifecycle. In the US, natural gas is used for electricity generation, heating, and several industrial processes. Approximately 24% of the electricity generated comes from natural gas (1). Natural gas plants have heat rates that range from 5,800 BTU/kWh to 12,300 BTU/kWh (7).

US Natural Gas Industry in 2003

In 2003, the total supply of natural gas in the US was over 27 trillion cubic feet. Of this, 26.5 trillion cubic feet were produced in North America (US, Canada, and Mexico), and 0.5 trillion cubic feet were imported in the form of LNG. 75% of LNG came from Trinidad and Tobago. Other exporting countries included Algeria, Malaysia, Nigeria, Qatar, and Oman (4). Table 1 shows more detailed statistics about the state of the US natural gas industry in 2003. Numbers may not add up due to rounding.

Table 1: 2003 Natural Gas Industry Statistics (All units in million cubic feet) (4)

Gross Withdrawals	24,000,000
Total Dry Production	19,000,000
Total Supply	27,000,000
Total Consumption	22,500,000
Total Imports	4,000,000
Pipeline Imports	3,500,000
LNG Imports	505,000

Greenhouse gas emissions from Natural Gas produced in North America

During the late 1980's and early 1990's the US Environmental Protection Agency (EPA) conducted a study to determine methane emissions from the natural gas industry. This very comprehensive study developed hundreds of activity and emissions factors from all the areas of the natural industry. These factors were developed using data collected from the different sectors of the industry as well as from data collected in field measurements. Table 2 presents the percentage of produced natural gas that is emitted to the atmosphere

during the lifecycle according to the results of the previously described study, as well as the source of these emissions.

Table 2: Methane Emissions from North American Gas Life Cycle as a Percentage of Natural Gas Produced (8).

Lifecycle Segment	Emission Sources	Emissions as a Percentage of Gas Produced
Production	Pneumatic Devices	0.38%
	Fugitive Emissions	
	Underground Pipeline Leaks	
	Blow and Purge	
	Compressor	
	Glycol Dehydrator	
Processing	Fugitive Emissions	0.16%
	Compressor	
	Blow and Purge	
Transmission and Storage	Fugitive Emissions	0.53%
	Blow and Purge	
	Pneumatic Devices	
	Compressor	
Distribution	Underground Pipeline Leaks	0.35%
	Meter and Pressure Stations	
	Customer Meter	

Based on the statistics presented in Table 1, 26.5 billion cubic feet of natural gas were produced in North America in 2003. Using the percentages of natural gas emitted, an average heat content of 1,030 BTU/ft³, and the assumption that 100% of the natural gas lost is methane (density 19.23 gr/ ft³) which may result in a slight overestimate of emissions given that the real percentage of methane in natural gas varies between 94% and 98%; total methane emission were calculated to develop the emission factors shown in Figure 4.

In addition to methane, carbon dioxide emissions are produced from the combustion of natural gas used during the lifecycle stages previously described. The Energy Information Administration maintains records of the amount of natural gas used during the production, processing, transmission, storage, and distribution of natural gas. This data for 2003 can be seen in Table 3. Assuming that 100% of this gas is methane, total carbon dioxide emissions were found using thermodynamic calculations. These emissions were then added to methane emissions to obtain the total emission factors shown in Figure 3.

Table 3: Natural Gas Used During Natural Gas Life Cycle. (All units in million cubic feet) (4).

Flared Gas	98,000
Lease Fuel	760,000
Pipeline and Distribution Use	665,000
Plant Fuel	365,000

In 1993 the Natural Gas STAR program was established by the EPA to reduce methane emissions from the natural gas industry. The program is a voluntary partnership with the goal of encouraging industries to adopt practices that increase efficiency and reduce emissions. Since 1993, 338 billion cubic feet of methane have been eliminated. In 2003, 52,900 million cubic feet of methane emissions were eliminated, a 9% reduction over projected emissions for that year without improved practices (9). This data was used to develop a range of emission factors for the North American natural gas industry. Figure 2 shows the total range of emission factors for the North American natural gas lifecycle. It can be seen that total lifecycle emission for natural gas produced in North America are approximately 140 lbs CO₂/MMBTU, an amount dominated by combustion emissions for natural gas plants currently in operation in the US of an average 120 lbs CO₂/MMBTU (10)

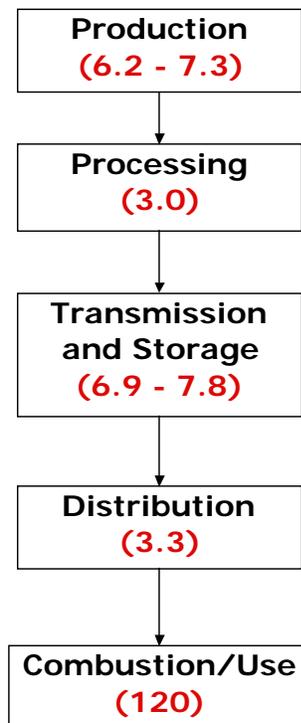


Figure 2: Carbon Dioxide Equivalent Emission Factors from North American Gas Lifecycle (All Units in lbs CO₂/MMBTU).

Greenhouse gas emissions from LNG lifecycle

As shown in Figure 1, the addition of liquefied natural gas (LNG) into the North American gas system introduces three additional stages into the lifecycle of natural gas: liquefaction, tanker transport, and regasification. It is assumed that natural gas produced in other countries and imported to the US in the form of LNG produces the same emissions in the production, processing, transmission, and distribution stages of the lifecycle as if the natural gas were produced in North America. Additional emission factors needed to be developed for the three additional lifecycle stages of LNG. Tamura et-al (11) has reported emission factors for the liquefaction stage in the range of 1.32 to 3,67 gr-C/MJ. Using these results, the emission factors for liquefaction were found in units of pounds of CO₂ per million BTUs, as shown in Table 4.

Table 4: Liquefaction Emission Factors.

Liquefaction	Emission Factors (lb CO ₂ /MMBTU)		
	Min	Average	Max
CO ₂ from fuel combustion	11	12	13
CO ₂ from flare combustion	0.00	0.77	1.5
CH ₄ from vent	0.09	1.3	9.8
CO ₂ in raw gas	0.09	4.0	6.6

Emissions from tanker transport of LNG were calculated using Equation 1.

$$EmissionFactor = \frac{(EF) \sum_x \left[2 \times roundup \left(\frac{LNG_x}{TC} \right) \times \frac{D_x}{TS} \times FC \times \frac{1}{24} \right]}{LNG_T}$$

Equation 1: Tanker Emission Factor.

Where EF is the tanker emission factor of 3,200 kg CO₂/ ton of fuel consumed; 2 is the number of trips each tanker does for every load (one bringing the LNG and one going back empty); LNG_x is the amount of natural gas (in cubic feet) brought from each country; TC is the tanker capacity in cubic feet of natural gas, assumed to be 120,000 cubic meters of LNG (1 m³ LNG = 21,537 ft³ NG); D_x is the distance from each country to US LNG facilities; TS is the tanker speed of 14 Knots; FC is a fuel consumption of 41 tons of fuel per day; and 24 is hours per day (12).

Exporting countries, their distances to the LNG facilities at Lake Charles, LA and Everett, MA, and the 2003 US imports can be seen in Table 5.

Table 5: LNG Exporting Countries in 2003 (4).

Exporting Country	Distance to Lake Charles Facility (nautical miles)	Distance to Everett, MA Facility (nautical miles)	2003 US Imports (million cubic feet NG)
Algeria	5,000	3,300	53,000
Australia	12,000	11,000	0
Brunei	12,000	11,000	0
Indonesia	12,000	11,000	0
Malaysia	12,000	11,000	2,700
Nigeria	6,100	5,000	50,000
Oman	8,900	7,500	8,600
Qatar	9,700	8,000	14,000
Trinidad	2,200	2,000	380,000
UAE	9,600	7,959	0
Russia	9,600	11,000	0

Emission factors for tanker transport from each country to both US facilities can be seen in Figure 3.

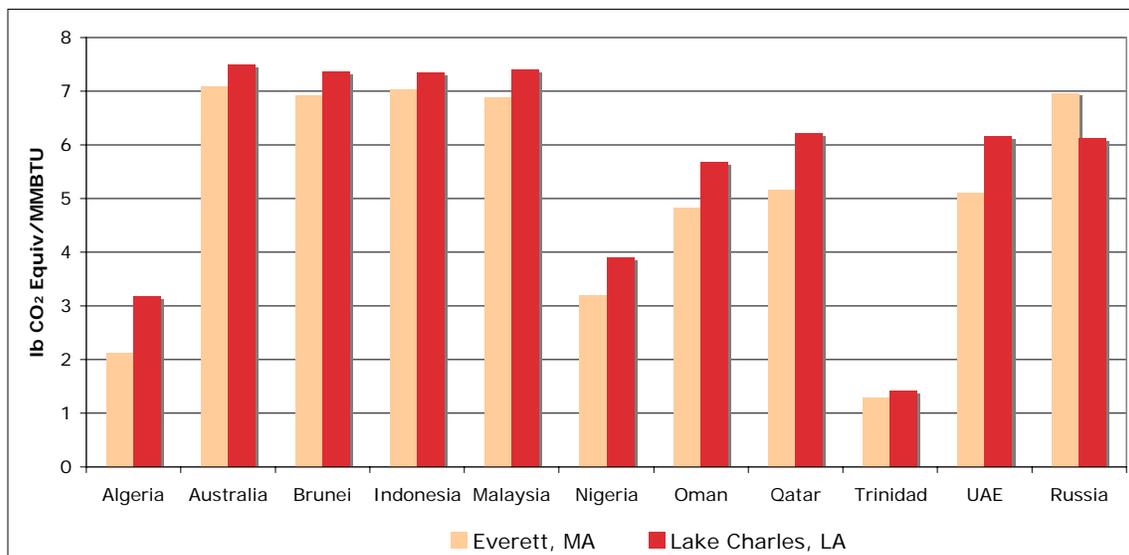


Figure 3: Tanker Emission Factors from Each Country

Since most of the LNG in 2003 was brought from Trinidad, the weighted average emission factor calculated for trips from each country to the Everett, MA facility is considered to be the a lower bound. An upper bound was obtained by assuming that all LNG was brought from Indonesia to the Lake Charles facility, and an average was obtained assuming all LNG was brought from Oman to the Lake Charles, LA facility. These resulting numbers can be seen in Table 6.

Table 6: Tanker Transport Emission Factors.

Emission Factors (lb CO₂/MMBTU)	
Min	1.8
Average	5.7
Max	7.3

Regasification emissions were reported by Tamura et-al to be 0.1 gr C/ MJ (0.85 lb CO₂/MMBTU) (11). Ruether et-al reports an emission factor of 1.6 gr CO₂/MJ (3.75 lb CO₂/MMBTU) for this stage of the LNG lifecycle by assuming that 3% of the gas is used to run the regasification equipment (13). These values were used as the lower and upper bounds of the range of emission from regasification of LNG. Total LNG lifecycle emissions are shown in Figure 4. They range between 154 and 184 lbs CO₂/MMBTU

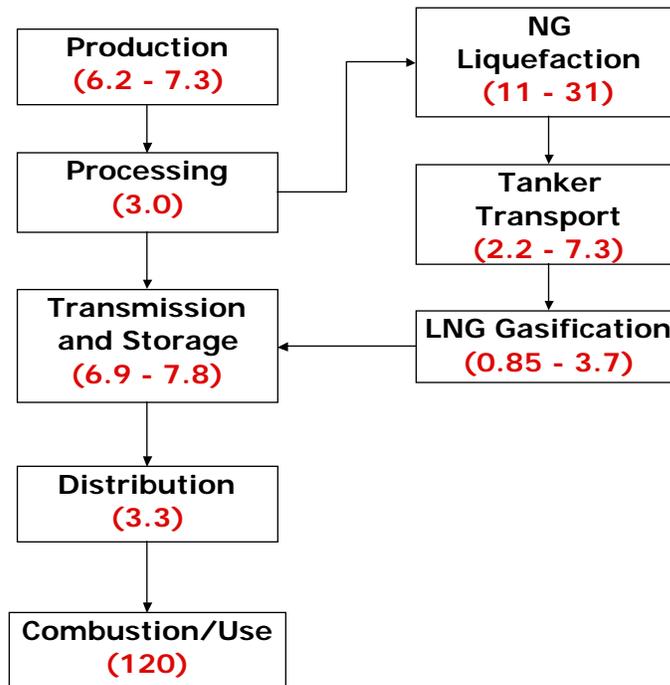


Figure 4: LNG Lifecycle Emission Factors (All Units in lbs CO₂/MMBTU).

Coal Lifecycle and its Greenhouse Gas Emissions for Electricity Generation

The coal lifecycle is conceptually simpler than the natural gas lifecycle, consisting of only three steps, as shown in Figure 5.



Figure 5: Coal Lifecycle.

In the US, 67% of the coal produced is mined in surface mines, while the remaining 33% is extracted from underground mines (1). Mined coal is then processed to remove impurities. Coal is then transported from the mines to the consumers via rail (84%), barge (11%), and trucks (5%) (14). Emissions from these lifecycle steps were calculated using the EIO-LCA tool developed at Carnegie Mellon University. In order to use this tool, economic values for each step of the lifecycle were necessary. In 1997, the year for which the EIO-LCA tool has data, the price of coal was \$18.14/ton (15). Moreover, the cost for rail transport, barge, and truck transport was \$11.06/ton, \$3.2/ton, and \$5.47/ton respectively (14). For a million tons of coal the following emission information was obtained using EIO-LCA.

Table 7: EIO-LCA Emission Data for Coal Lifecycle (16).

Sector	Total GHG Emissions (MT CO₂ Equiv)
Mining	75,000
Rail Transportation	36,000
Water Transportation	3,700
Truck Transportation	5,000

Using a weighted average US coal heat content of 10,266 BTU/lb (17) and the data previously discussed, it was found that the average emission factor for coal mining and transport is 11 lb CO₂/MMBTU.

In 1999, the National Renewable Energy Lab published a report on lifecycle emissions for power generation from coal (18). Upstream coal emissions (including transportation) from underground mines are reported to be 15 lbs CO₂/MMBTU, while upstream coal emissions from surface mines is 9.9 lbs CO₂/MMBTU. As previously mentioned, 67% of coal is currently mines in surface mines, while 33% is mined in underground mines (1). Using this information, the current coal upstream emissions average 12 lbs CO₂/MMBTU, which is very close to the emission factor obtained using EIO-LCA. In the future, the distribution of US mines could change, affecting the average emission factor. For this reason, the range of coal upstream emissions from underground and surface mines described above is used for this paper. Moreover, the average emission factors for coal combustion at utility plants used is 205 lb CO₂/MMBTU (10).

Comparing Natural Gas and Coal Lifecycle Emissions

Emissions factors for the natural gas lifecycle and the coal lifecycle were previously reported in pounds of CO₂ per MMBTU of fuel. Coal and natural gas power plants have

different efficiencies; thus one million BTU of coal does not generate the same amount of electricity as one million BTU of natural gas. For this reason, emission factors must be converted to units of pounds of CO₂ per kWh of electricity generated. This conversion was done using the heat rates of natural gas and coal plants. Figure 6 shows the distribution of these heat rates, and Figure 7 shows the resulting emission factor distribution for coal and natural gas. These distributions were obtained using the cumulative distribution function of EIA electricity generation data for all utility plants in 2003 (7). The minimum value represents the heat rate at which 5% of the electricity generated with the specific fuel is seen. Similarly the mean and maximum values are the heat rates at which 50% and 95% of the electricity has been generated with each fuel. As seen in Figure 6, the average heat rate for natural gas plants is lower than the average heat rate for coal plants, however the upper range of heat rates for natural gas plants surpasses the heat rates for coal plants.

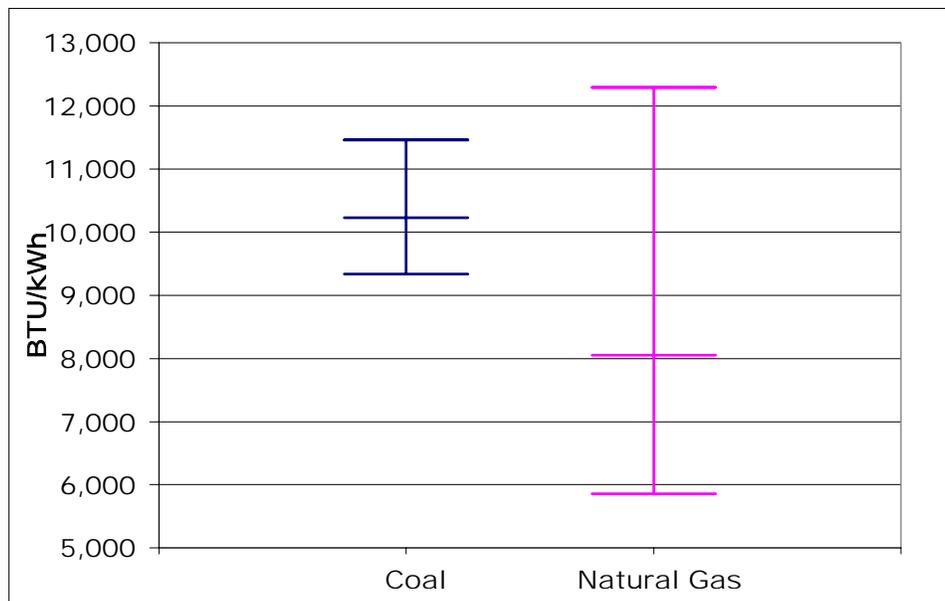


Figure 6: Natural Gas and Coal Plant Heat Rates (7).

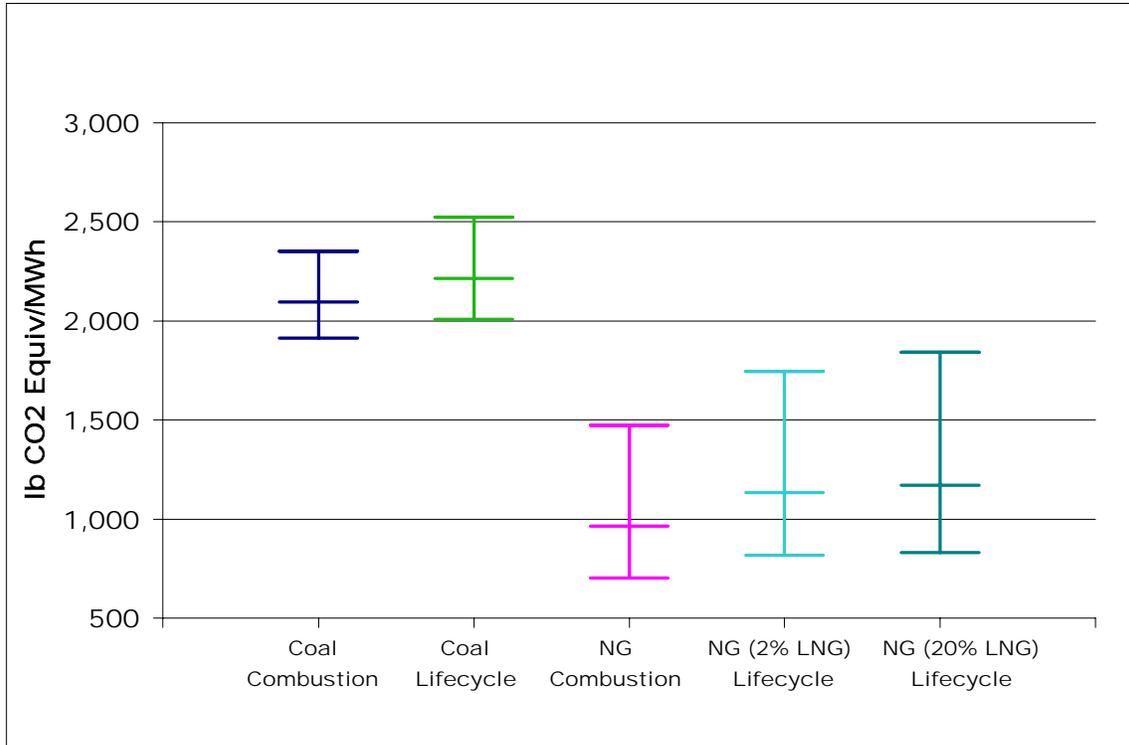


Figure 7: Emission Factors for Coal and Natural Gas Lifecycles.

Note that the average emission factor for coal combustion is higher than the emission factor for natural gas combustion. This does not change too much when the whole lifecycle is considered. More important seems to be the effect that including upstream emissions have in the range of emission factors for natural gas. While the average emission factor for the total coal lifecycle only increases by 5% compared to combustion emissions, the average emission factor for a natural gas mix with 20% LNG is 21% higher than the combustion emissions. Moreover, the maximum emission factor of the natural gas lifecycle gets closer to the minimum coal lifecycle emission factor. These results imply that if emissions at the combustion stage of the lifecycle could be controlled, natural gas would not be a much better alternative to coal in terms of greenhouse gas emissions.

New Generation Capacity

According to the DOE, by 2025 43 GW of inefficient gas and oil fired facilities will be retired, while 281 GW of new capacity will be installed (3). IGGC and NGCC power plants will probably be installed. These plants are generally more efficient than current technologies (average HHV Efficiencies are 37.5% and 50.2% respectively) (19) and thus have lower carbon emissions at the combustion stage. In addition, carbon capture and sequestration (CCS) can be performed more easily with these newer technologies. CCS is a process by which carbon emissions at the power plant are separated from other combustion products, captured and injected into underground geologic formations such as saline formations and depleted oil/gas fields. Experts believe that 90% CCS will be

technologically and economically feasible in the future. Having CCS at IGCC and NGCC plants decreases the efficiency of the plants to average HHV efficiencies of 32.4% and 42.8% respectively (19) but overall lifecycle emissions would be greatly reduced and would be essentially the same for coal and natural gas (with 20% LNG). However, the major contributor for coal emissions would be at the combustion stage, while for natural gas the majority of the emissions would come from upstream processes. Figure 8, shows total emissions with CCS for IGCC and NGCC plants using average upstream emission factors of 11.6 lbs CO₂ Equiv/MMBTU and 25.6 lbs CO₂ Equiv/MMBTU for coal and natural gas respectively

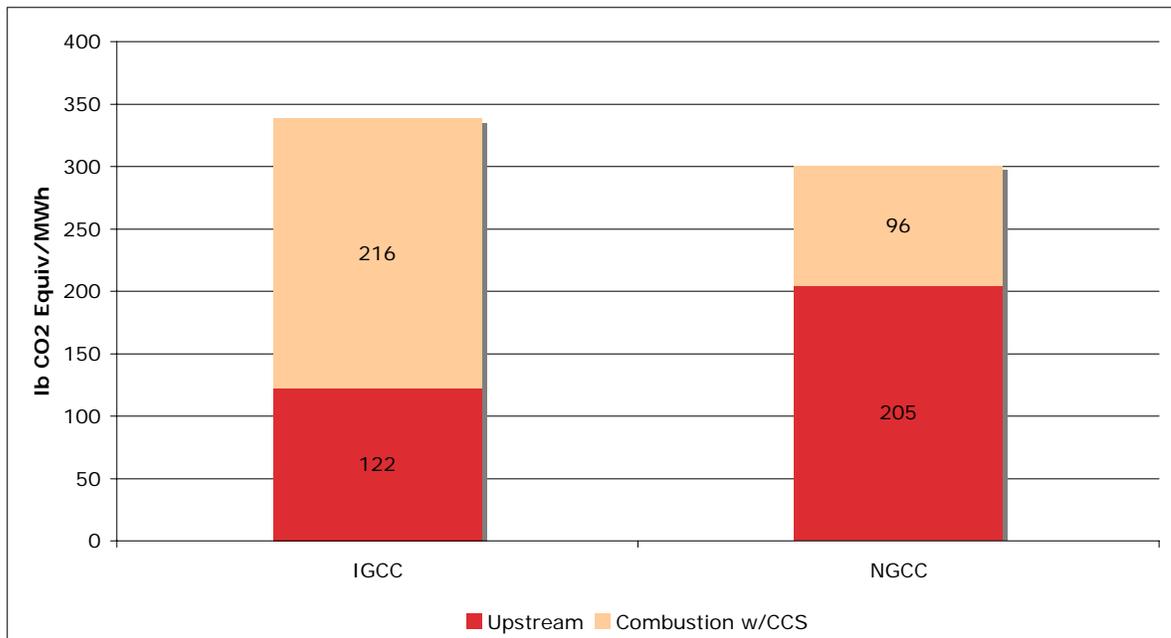


Figure 8: Lifecycle Emission Factors for IGCC and NGCC plants w/ CCS.

Discussion

It has been shown that there is high uncertainty about overall lifecycle carbon emissions for coal and LNG. In the future, as newer generation technologies and CCS are installed, overall emissions from electricity generated with coal and electricity generated with natural gas could be surprisingly similar. There is push right now from power generator to increase import of LNG. They seem to hope that the price of natural gas will decrease with these imports and they will be able to recover the investment they made in natural gas plants that are currently producing under capacity. These investments should be considered sunk costs and it is important to reevaluate whether investing billions of dollars in LNG infrastructure will lead us into an energy path that cannot be easily changed as it will be harder to consider these investments as sunk costs once the expected environmental benefits are not achieved.

The analysis presented here only includes carbon emission, and no consideration was given to issues like energy security. Increasingly, LNG will come from areas of the world that are politically unstable. Policymakers should evaluate this increased dependence on foreign fuel before making decisions about future energy investments. In addition, the analysis presented only considers the use of natural gas for electricity generation. Natural gas is an indispensable fuel for many sectors of the US economy. As demand for natural gas from the electric utilities increases, these other sectors will probably be affected by higher natural gas prices. It is important to analyze whether these other sectors constitute a better use for natural gas than electricity generation, which has alternative fuels at its disposal.

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TESTIMONY OF JAMES BRADBURY

**SENIOR ASSOCIATE, CLIMATE AND ENERGY PROGRAM
WORLD RESOURCES INSTITUTE**

**HEARING BEFORE THE U.S. HOUSE OF REPRESENTATIVES ENERGY AND
COMMERCE SUBCOMMITTEE ON ENERGY AND POWER:
“U.S. ENERGY ABUNDANCE:
EXPORTS AND THE CHANGING GLOBAL ENERGY LANDSCAPE”**

May 7, 2013

Summary of Key Points:

Liquefied natural gas (LNG) exports present both opportunities and risks. Producing and delivering natural gas to customers is highly energy- and emissions-intensive, particularly when LNG is involved. Research by the World Resources Institute has found that cuts in upstream methane leakage from natural gas systems are among the most important steps the U.S. can take toward meeting our greenhouse gas (GHG) emissions reduction goals by 2020 and beyond.

This testimony focuses on fugitive methane emissions and the many cost-effective solutions available for reducing them. It appears very likely that LNG exports from U.S. terminals would result in increased domestic GHG emissions from both upstream and downstream sources. Policymakers should more actively work to help achieve reductions in GHG emissions from throughout the natural gas value chain, if this valuable fuel and LNG are to be part of the solution to the climate change problem. Taking these actions offer economic, environmental, and geopolitical benefits, both in the U.S. and internationally. To this end, I offer the following policy recommendations:

- Expand applied technology research programs at the U.S. Department of Energy to help reduce the cost of leak-detection and emissions measurement technologies, and to develop new and lower-cost emission reduction strategies.
- Update emissions factors for natural gas systems using robust measurement protocols, public reporting by industry, and independent verification.
- Authorize and appropriate funding for the organization STRONGER (State Review of Oil and Natural Gas Environmental Regulations) to help states with timely development and evaluation of their environmental regulations.
- Support voluntary programs at the U.S. Environmental Protection Agency (EPA), including Natural Gas STAR and other programs which recognize companies that demonstrate a commitment to best practices.
- Support EPA’s efforts to provide technical and regulatory assistance to states with expanding oil and natural gas development, including through the Ozone Advance Program.
- Enact policies to support clean energy and address climate change. A clean energy standard or putting a price on carbon would provide clear signals to energy markets that energy providers and users need to recognize the environmental and social costs as well as the direct economic costs of energy resources.

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May 7, 2013

Good morning, and thank you for the opportunity to contribute to the deliberations of this Subcommittee. My name is James Bradbury, and I am a senior associate in the Climate and Energy Program at the World Resources Institute (WRI). WRI is a non-profit, non-partisan think tank that focuses on the intersection of the environment and socio-economic development. We go beyond research to put ideas into action, working globally with governments, business, and civil society to build transformative solutions that protect the earth and improve people’s lives. We operate globally because today’s problems know no boundaries. We provide innovative paths to a sustainable planet through work that is accurate, fair, and independent.

Summary

I am pleased to be here today to offer WRI’s perspective on the climate implications of U.S. liquefied natural gas (LNG) exports. I encourage this committee to weigh a complete consideration of the associated economic and geopolitical opportunities next to the potential risks, neither of which have been fully considered in the public debate. In particular, it appears very likely that LNG exports from U.S. terminals would result in increased domestic greenhouse

gas (GHG) emissions. For example, analysis by the Energy Information Administration (EIA)¹ concluded that any scenario of LNG exports would trigger an increase in domestic carbon dioxide (CO₂) emissions, due to an increase in coal-fired electricity and use of natural gas for the energy-intensive liquefaction process at LNG terminals. The EIA also projected an increase in natural gas production from shale wells. Though not considered in the EIA study, an inevitable consequence would be greater upstream air emissions from natural gas infrastructure – that is, emissions that occur prior to fuel combustion – including fugitive methane, which is a potent global warming pollutant. While LNG exports from the U.S. are widely expected to marginally reduce global CO₂ emissions, modeling to date suggests that the scale of these reductions is less than ten percent of the total levels of global fugitive methane emissions from natural gas and oil systems.

These facts should raise the bar for policymakers and advocates for LNG exports to more actively work to achieve continuous improvement in GHG emissions from all life cycle stages (from extraction to use), if natural gas and LNG are to be part of the solution to our climate change problem. Furthermore, to the extent that substantial LNG exports from the U.S. move forward, our national policy objectives should be broader than simply improving our balance of trade vis-à-vis fossil fuel exports to increase our economic and geopolitical standing. We also have an important – indeed urgent – opportunity to improve our economic and geopolitical standing by showing leadership in addressing global climate change. We can do through policies

¹ See: http://www.fossil.energy.gov/programs/gasregulation/reports/fe_eia_lng.pdf

that promote the development, deployment, and export of low-carbon products and services² to help enable global GHG emissions reductions from all sectors, including through technologies and practices that allow the cleaner production and more efficient end-use of natural gas.

Today I will focus in particular on fugitive methane emissions³ and the cost-effective solutions available for reducing them.⁴ The case for policy action is particularly strong considering that recent research shows that climate change is happening faster than expected. In addition, the projected expansion in domestic oil and natural gas production increases the risk of higher GHG emissions if proper protections are not in place.

- Methane is the primary component of natural gas and also a potent greenhouse gas. Methane leaked from natural gas systems (i.e., fugitive methane) represent lost product and reduced revenue for companies and governments, with negative consequences for air quality and the environment.
- Fugitive methane emissions from natural gas systems represent roughly 3 percent of global warming pollution in the U.S. Reductions in methane emissions are urgently needed as part of the broader effort to slow the rate of global temperature rise.
- Although natural gas burns much cleaner than coal or oil, fugitive methane emissions significantly reduce this relative advantage, from a climate standpoint; therefore, cutting

² For more information on low-carbon market opportunities, see Jennifer Morgan’s testimony, here: <http://www.wri.org/publication/testimony-american-energy-security-and-innovation-assessment-of-energy-resources>

³ While this testimony focuses on greenhouse gas emissions – and methane emissions from natural gas systems, in particular – WRI is committed to minimizing the full scope of impacts cause by energy production and use. It is critical for U.S. energy policies to be developed with consideration to a broad range of risks and benefits.

⁴ For more detailed analysis and discussion of this topic, see WRI’s recent working paper, “Clearing the Air: Reducing Upstream Greenhouse Gas Emissions from U.S. Natural Gas Systems.” Available at: <http://www.wri.org/publication/clearing-the-air>

fugitive emissions from natural gas systems would ensure that the climate impacts of natural gas are much lower than coal or diesel fuel over any time horizon.

- Recent emissions standards from the U.S. Environmental Protection Agency (EPA) will substantially reduce leakage from natural gas systems, but to help slow the rate of global warming pollution and improve air quality, further action by states and federal agencies should directly address fugitive methane from new and existing wells and equipment.
- Fortunately, most strategies for reducing fugitive methane emissions are cost-effective, with payback periods of three years or less. A recent WRI report found that cuts in methane leakage from natural gas systems are among the most important steps the U.S. can take toward meeting our GHG emissions reduction goals.⁵
- The process of liquefaction, transport, and regasification of LNG is highly emissions-intensive, increasing by 15 percent the total life cycle GHG emissions associated with exported U.S. natural gas, compared to natural gas that is produced and consumed domestically. These added upstream emissions also significantly reduce the relative advantage that natural gas would have over higher-emitting fuels, like coal and oil.
- The following policy actions by Congress would help reduce methane emissions as cost-effectively and quickly as possible:
 - Expand applied technology research programs at the U.S. Department of Energy (DOE) to help reduce the cost of leak-detection and emissions measurement technologies, and to develop new and lower-cost emission reduction strategies.

⁵ See: “Can the U.S. Get There from Here? Using Existing Federal Laws and State Actions to Reduce Greenhouse Gas Emissions,” available at: <http://www.wri.org/publication/can-us-get-there-from-here>.

- Update emissions factors for natural gas systems using robust measurement protocols, public reporting by industry, and independent verification.
- Authorize and appropriate funding for the organization STRONGER (State Review of Oil and Natural Gas Environmental Regulations) to help states with timely development and evaluation of their environmental regulations.
- Support voluntary programs at EPA, including Natural Gas STAR and other programs which recognize companies that demonstrate a commitment to best practices.
- Support EPA's efforts to provide technical and regulatory assistance to states with expanding oil and natural gas development, including through the Ozone Advance Program.
- Broader action on policies supporting clean energy and addressing climate change should also be on the table. A clean energy standard or putting a price on carbon would provide clear signals to energy markets that energy providers and users need to recognize the environmental and social costs as well as the direct economic costs of energy resources.

Finally, every day that we take no policy action on climate change, we make the policy choice to let climate change run its course. This ignores the overwhelming consensus of climate scientists who have been warning for decades that rising GHG emissions will cause the planet to warm, sea levels to rise, and weather to become more extreme. It is indisputable that these climate changes are happening today, in many cases much more quickly than expected. Action is urgently needed.

LNG Exports, the Public Interest, and Climate Change

When reviewing grant applications for LNG export authorizations, DOE is required to determine if proposed exports “will not be consistent with the public interest.” In making this finding, DOE is considering a range of factors, including economic, energy security, and environmental impacts.⁶ The climate change implications of LNG exports touches on each of these factors and therefore deserves more careful consideration by Congress and DOE.

The January 2012 study by EIA included a useful but limited assessment of the climate change implications of LNG exports, while the NERA Economic Consulting report (December 2012) was more narrowly focused on macroeconomic considerations.⁷ This testimony focuses particular attention to how LNG exports – and increased production of natural gas more broadly – could affect domestic and international GHG emissions, which is clearly a question of relevance to the public interest.

There is no doubt that our climate is already changing in ways that are increasingly risky, difficult to manage, and harmful to public health and the environment.⁸ Recent science assessments – including by the U.S. National Academy of Sciences and the U.S. Global Change Research Program⁹ – agree that GHG emissions are very likely causing higher global temperatures, rising sea levels, and more frequent extreme weather events. National science

⁶ See: <http://www.fossil.energy.gov/programs/gasregulation/LNGStudy.html>

⁷ Both reports are available here: <http://www.fossil.energy.gov/programs/gasregulation/LNGStudy.html>

⁸ National Academies, Committee on Climate Choices, Final Report, 2011. <http://dels.nas.edu/Report/America-Climate-Choices-2011/12781>

⁹ <http://ncadac.globalchange.gov/download/NCAJan11-2013-publicreviewdraft-fulldraft.pdf>

academies from over a dozen countries, including the U.S., have expressly urged governments to take urgent action to curb these harmful emissions.¹⁰

The current U.S. commitment to the international community is to reduce GHG emissions below 2005 levels by 17 percent in 2020 and 83 percent in 2050.¹¹ While a shift in electric generation to natural gas from coal has played a significant role in recent reductions in U.S. carbon dioxide emissions, this market-driven trend in the power sector has reversed somewhat in recent months, as natural gas prices have been increasing.¹² Furthermore, GHG emissions from all major sources will need to be addressed for the U.S. to help achieve climate stabilization at 2° Celsius, which the international community has agreed to be an appropriate and relatively safe target. A recent report by the World Bank¹³ found that the world is on track for at least a 4° Celsius increase in global temperatures, which would be extremely damaging to global development goals and be “marked by extreme heat-waves, declining global food stocks, loss of ecosystems and biodiversity, and life-threatening sea level rise.” However, the World Bank also concluded that there is still time to enact policies that would help avoid this outcome.

¹⁰ G8+5 Academies’ joint statement: Climate change and the transformation of energy technologies for a low carbon future. <http://www.nationalacademies.org/includes/G8+5energy-climate09.pdf>

¹¹ See:

http://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/unitedstatescphaccord_app.1.pdf

¹² See: <http://insights.wri.org/news/2013/03/new-data-reveals-rising-coal-use>

¹³ See: <http://climatechange.worldbank.org/content/climate-change-report-warns-dramatically-warmer-world-century>

Concerns about the environmental impacts of shale gas development

Natural gas production in the United States has increased rapidly in recent years, growing by 23 percent from 2007 to 2012.¹⁴ This development has significantly changed projections of the future energy mix in the U.S. The shale gas phenomenon has also helped reduce energy prices, directly and indirectly supporting growth for many sectors of the U.S. economy, including manufacturing. The EIA projects that the United States will begin exporting LNG within 5 years and that the country will be a net natural gas exporter by the year 2020.¹⁵

Shale gas development has also triggered divisive debates over the near- and long-term environmental implications of developing and using these resources, including concerns about water resources, air quality, and land and community impacts.¹⁶ Like all forms of energy, including conventional natural gas, there are public health and environmental risks associated with shale gas development. Chief among public concerns are drinking water contamination resulting from improper wastewater management, chemical spills, and underground methane migration into groundwater. There are also concerns regarding air emissions, and land-related impacts including habitat fragmentation and soil erosion. Other common concerns involve community impacts related to industrial development and extensive truck traffic. In 2011, the Secretary of Energy Advisory Board's Natural Gas Subcommittee warned¹⁷ that "disciplined attention must be devoted to reducing the environmental impact" of shale gas development in the

¹⁴ See: <http://www.eia.gov/forecasts/aeo/index.cfm>

¹⁵ *ibid*

¹⁶ For more detailed discussions of the broader environmental impacts of natural gas development, see: <http://www.gao.gov/products/GAO-12-732>; and http://www.rff.org/Documents/RFF-Rpt-PathwaystoDialogue_FullReport.pdf

¹⁷ http://www.shalegas.energy.gov/resources/111811_final_report.pdf

face of its expected continued rapid growth, with as many as 100,000 more wells expected over the next few decades.

Of particular concern are the air emissions and climate change implications of shale gas development, including fugitive methane emissions, which reduce the net climate benefits of using lower-carbon natural gas as a substitute for coal and oil for electricity generation and transportation, respectively. Other air emissions from the natural gas sector include CO₂, volatile organic compounds (VOCs, which are chemicals that contribute to ground-level ozone and smog), and hazardous air pollutants (HAPs). In 2012, EPA finalized air pollution standards for VOCs and HAPs from the oil and natural gas sector. These rules will improve air quality and have the co-benefit of reducing methane emissions. As discussed below (see p. 18, “Progress is Being Made but There is More Work to Be Done”), these standards should be complemented by additional actions to further reduce methane emissions, which will help slow the rate of global temperature rise in the coming decades.

From the standpoint of CO₂ emissions, shale gas development and lower natural gas prices have contributed to recent emissions reductions in the U.S. However, GHG emissions are projected to rise, and market forces and voluntary actions alone will not enable an effective response to climate change. Thus broad policy action will be needed. For example, analysis by the International Energy Agency (IEA)¹⁸ found that a significant global increase in use of natural gas over the coming decades could have some net climate benefits compared to scenarios in which oil and coal play more prominent roles. However, the IEA’s “Golden Rules Case” scenario

¹⁸ International Energy Agency, “Golden Rules for a Golden Age of Gas.” Available at: http://www.worldenergyoutlook.org/media/weowebiste/2012/goldenrules/weo2012_goldenrulesreport.pdf

would result in CO₂ concentrations in the atmosphere of 650 parts per million (ppm) and a global temperature rise of 3.5° Celsius, almost twice the internationally accepted 2° Celsius target.

Economic modeling conducted by researchers at MIT¹⁹ and Resources for the Future²⁰ have also found that while greater use of natural gas may offer some climate benefits, climate and energy policies will be needed to reduce CO₂ emissions by anywhere near our 83 percent target by mid-century. While natural gas will likely play an essential bridging role in this transition, this will require both reducing the upstream GHGs produced during the extraction process, and — if gas-fired power plants are to be a part of a longer-term energy future — using carbon capture and storage (CCS) technology.

Why Focus on Methane Emissions?

Though methane accounted for only 10 percent of the U.S. greenhouse gas emissions inventory in 2010 (Figure 1),²¹ it represents one of the most important opportunities for reducing GHG emissions in the U.S.²² In addition to the scale and cost-effectiveness of the reduction opportunities, climate research scientists have concluded that cutting methane emissions in the near term could slow the rate of global temperature rise over the next several decades.²³

¹⁹ See: <http://globalchange.mit.edu/research/publications/2229>

²⁰ See: <http://www.rff.org/RFF/Documents/RFF-IB-09-11.pdf>

²¹ Note: all GHG inventory numbers referred to in this testimony were adjusted to reflect a more current global warming potential (GWP) for methane of 25 (IPCC 2007). This is necessary because when EPA converts methane to carbon dioxide equivalents they use an out-of-date GWP for methane of 21 (IPCC 1995), for the sake of consistency with UNFCCC reporting guidelines.

²² See: “Can the U.S. Get There from Here? Using Existing Federal Laws and State Actions to Reduce Greenhouse Gas Emissions,” available at: <http://www.wri.org/publication/can-us-get-there-from-here>.

²³ National Research Council, 2011. “Climate Stabilization Targets: Emissions, Concentrations, and Impacts over Decades to Millennia,” ISBN: 0-309-15177-5, 298 pages. <http://www.nap.edu/catalog/12877.html>

Rising methane concentrations in the atmosphere have a potent, near-term warming effect because this greenhouse gas has a relatively high global warming potential and short atmospheric lifetime (IPCC 2007). Global warming potential (GWP) is a measure of the total energy that a gas absorbs over a particular period of time (usually 100 years), compared to carbon dioxide. Key factors affecting the GWP of any given gas include its average atmospheric lifetime and the ability of that molecule to trap heat. By mass, the same amount of methane emissions is 25 times more potent than carbon dioxide emissions over a 100-year time horizon (IPCC 2007). In the 20-year time frame, studies estimate that methane's GWP is at least 72 times greater than that of carbon dioxide.

Scientists at the National Research Council of the U.S. National Academy of Sciences have concluded that global CO₂ emissions need to be reduced in the coming decades by at least 80 percent to stabilize atmospheric CO₂ concentrations and thereby avoid the worst impacts of global climate change.²⁴ However, given the slow pace of progress in the U.S. in this regard, it is valuable and important for policymakers to consider cost-effective mitigation strategies – such as cutting methane emissions – that would have a disproportionate short-term impact.

How Emissions-Intensive is U.S. Natural Gas?

EPA estimates that total emissions from the development, transmission, and use of natural gas in the U.S. made up roughly a quarter of the total U.S. GHG inventory in 2011.²⁵ While natural gas emits about half as much carbon dioxide as coal at the point of combustion, the picture is more

²⁴ Ibid.

²⁵ Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2011 (April 2013).
<http://www.epa.gov/climatechange/ghgemissions/usinventoryreport.html>

complicated from a life cycle perspective. Three percent of the U.S. inventory is the result of fugitive methane emissions from natural gas systems²⁶ – i.e., natural gas lost to the atmosphere through venting and systemic leaks, prior to the point of combustion. To put this in perspective, in 2011, these methane leaks resulted in more GHG emissions²⁷ than all of the direct and indirect GHG emissions from U.S. iron and steel, cement, and aluminum manufacturing combined.²⁸

EPA's 2013 GHG inventory implies a methane leakage rate of less than 2 percent of total natural gas production. Meanwhile, recent research²⁹ has shown that at less than a 3 percent leakage rate, natural gas produces fewer GHG emissions than coal over any time horizon. Additionally, reducing the methane leakage rate to below 1 percent would ensure that heavy-duty vehicles fueled by natural gas, like buses and long-haul trucks, would provide an immediate climate benefit over similar vehicles fueled by diesel. Thus, reducing total methane leakage to less than 1 percent of natural gas production is a sensible performance standard for the sector; an achievable benchmark that has not yet been reached.

Accurate estimates of the total leakage rate from the natural gas sector require reliable data for a broad range of industry activities and emissions factors associated with those activities. While EPA has recently updated industry activity data, most of the emissions factors rely on assumed emissions factors – as opposed to direct measurements, which are generally rare and often

²⁶ The GHG inventory estimates 6.9 million metric tons of fugitive methane from natural gas systems in 2011.

²⁷ This estimate is based on an assumed global warming potential for methane of 25, which is the convention when considering the climate implications of methane compared to carbon dioxide, integrated over a 100-year time frame (IPCC, 2007).

²⁸ See:

<http://www.energetics.com/resourcecenter/products/roadmaps/Pages/USManufacturingEnergyUseandGreenhouseGasEmissionsAnalysis.aspx>

²⁹ See: <http://www.pnas.org/content/109/17/6435>

outdated. Some recently published research suggests that emissions levels may be higher than EPA estimates; this, coupled with high ground-level ozone levels in Colorado and Texas and rural parts of Utah and Wyoming (i.e., smog that is attributed to shale gas production activities), suggests that the emissions problem may be worse than we think, and certainly subject to regional variations.³⁰

With hundreds of thousands of wells and thousands of natural gas producers operating in the U.S., the data quality issue will likely remain an active debate, even as forthcoming data from EPA and other sources in the coming months aims to clarify these questions.³¹ In its November 2011 final report, the Secretary of Energy Advisory Board recommended that natural gas companies measure and disclose air emissions from shale wells.³² Indeed, what remains lacking is a valid system for direct measurement and independent verification of emissions data reported by this sector.³³

Nevertheless, while uncertainties remain regarding exact methane leakage rates, the weight of evidence suggests that significant leakage occurs during every life cycle stage of U.S. natural gas systems and much more can be done to reduce these emissions cost-effectively. A recent expert

³⁰ Recent research based on field measurements of ambient air near natural gas well-fields in Colorado and Utah suggest that more than 4 percent of well production may be leaking into the atmosphere at some production-stage operations. For more discussion of questions regarding the quality and availability of methane emissions data, see Appendix 3 of “Clearing the Air,” here: <http://www.wri.org/publication/clearing-the-air>.

³¹ For example, independent researchers at the University of Texas at Austin are teaming up with the Environmental Defense Fund and several industry partners to directly measure methane emissions from several key sources. When results are published in 2013 and 2014, these data will provide valuable points of reference to help inform this important discussion.

³² See: <http://www.shalegas.energy.gov/>

³³ Such systems and protocols have been developed for tracking emissions from other sources. For example, see: <http://www.epa.gov/etv/vt-ams.html>

survey by Resources for the Future³⁴ identified methane emissions as a “consensus environmental risk” that should be addressed through government and industry actions.

How Will LNG Exports Affect Greenhouse Gas Emissions?

To the extent that it is displacing higher-carbon fuels such as coal and oil, natural gas has the potential to help reduce total greenhouse gas emissions. This is particularly true as long as upstream emissions associated with natural gas are minimized and ideally methane leakage is kept below 1 percent of total production, as discussed above.

That said, the potential for LNG exports raises three primary concerns from a climate perspective.

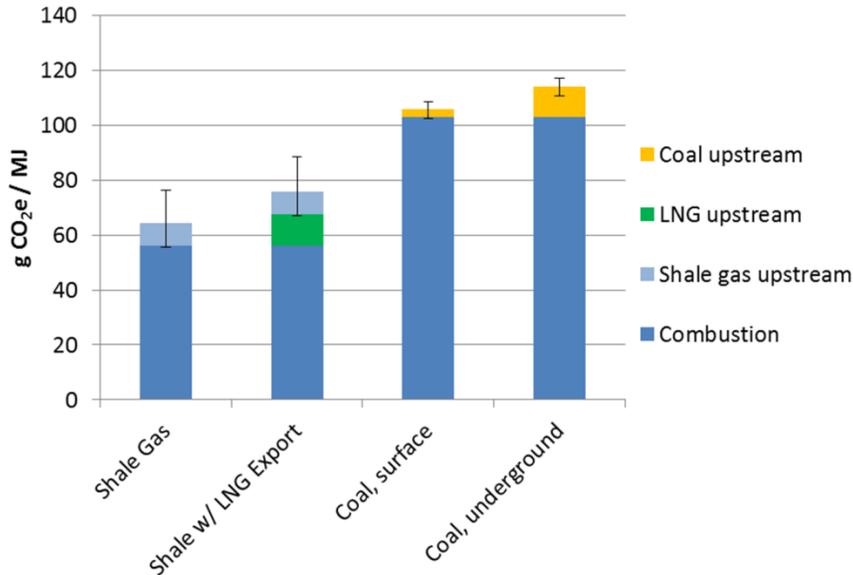
- 1) The first area of concern involves upstream GHG emissions associated with increased onshore natural gas production. EIA projects that LNG exports would result in increased domestic production of natural gas, with roughly three quarters of this from shale sources. As shown in Figure 1, there are significant upstream GHG emissions (both CO₂ and methane) associated with shale gas production in the U.S. Given continued uncertainty around the actual level of methane emissions over the lifetime of both conventional and unconventional gas wells,³⁵ this projected market response could result in substantially higher levels of GHG emissions from throughout U.S. natural gas systems. The good news is that there are many ways to cost-effectively reduce upstream methane emissions; we encourage government and industry to do more to realize this

³⁴ See: http://www.rff.org/Documents/RFF-Rpt-PathwaystoDialogue_FullReport.pdf

³⁵ Most studies estimate that upstream GHG emissions from conventional and unconventional gas sources are roughly comparable, within the margin of error.

opportunity (see p. 20 below, “Further Potential to Reduce Fugitive Methane Emissions”).

Figure 1: Estimated Life Cycle Greenhouse Gas Emissions from U.S. Shale Gas, LNG Exports, and Coal



Sources: Bradbury et al. 2013; Weber and Clavin, 2012; NETL, 2012; Burnham et al. 2011

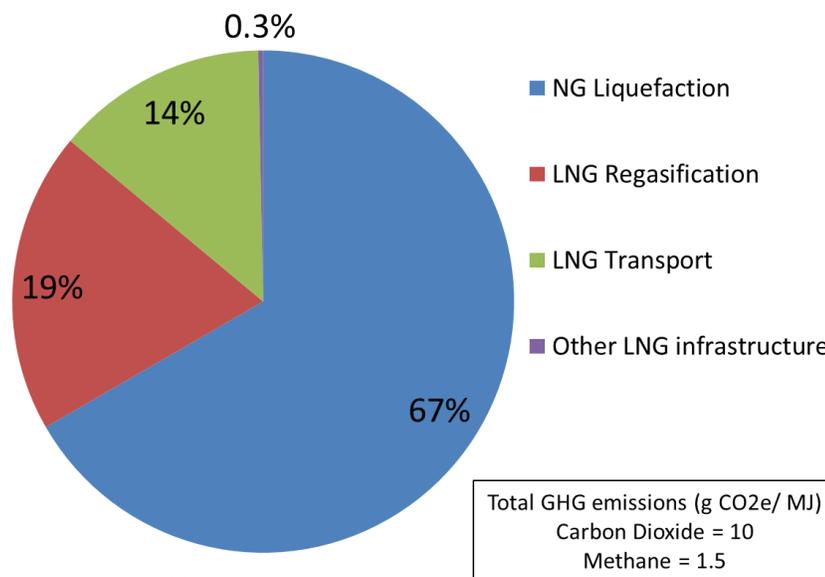
2) The second area of concern is with respect to the liquefaction, transport, and regasification of LNG exports. According to a 2012 Natural Gas Technology Assessment by the National Energy Technology Lab (NETL),³⁶ these energy- and emissions-intensive processes would add roughly 15 percent³⁷ to total life cycle GHG emissions associated with U.S. onshore natural gas production (see Figure 1, above, “LNG upstream”). These added upstream emissions significantly reduce the relative advantage that natural gas

³⁶ NETL (National Energy Technology Laboratory). 2012. Role of Alternative Energy Sources: Natural Gas Technology Assessment. National Energy Technology Laboratory, U.S. Department of Energy. Available at: <http://www.netl.doe.gov/energy-analyses/refshelf/PubDetails.aspx?Action=View&PubId=435>

³⁷ Based on data provided in Appendix B of the NETL (2012) report, we calculate 11.5 grams of CO₂ equivalent per megajoule (g CO₂e/MJ) of natural gas exported, which we added to estimated life cycle emissions associated with shale gas production, after the recent EPA rule takes effect (8.25 g CO₂e/MJ), and typical estimate of final combustion of natural gas (56 g CO₂e/MJ).

would have over higher-emitting fuels like coal.³⁸ The chart below illustrates the relative contributions of each process to total GHGs associated with LNG exports; liquefaction is the most emissions-intensive process, followed by regasification and transport. It is also worth noting that natural gas liquefaction emissions would occur at domestic LNG terminals, adding to total U.S. GHG emissions.

Figure 2: Life Cycle GHG Emissions from LNG Terminals, Transport, and Infrastructure



Source: Adapted from NETL, 2012

3) The third area of concern is the indirect domestic and international energy market implications of U.S. LNG exports. EIA’s 2012 report to DOE found that LNG exports would raise domestic prices for natural gas, making natural gas relatively less competitive compared to other energy sources in the U.S., resulting in greater use of coal

³⁸ Note that the data presented in Figure 1 show life cycle emissions estimates for the domestic production of natural gas and coal, with upstream LNG numbers assuming LNG exported from Trinidad and Tobago and imported in Louisiana. Ideally, this figure would offer a direct comparison between life cycle emissions from domestic shale gas production and export versus coal or fuel oil in the country of import. However, such data are not readily available at this time.

and higher levels of GHG emissions under all LNG export scenarios.³⁹ The global GHG implications of LNG exports from the U.S. is harder to assess, but the basic picture is that more gas would be sold into international markets, which would help reduce carbon dioxide emissions as long as it displaced higher-carbon fuel sources. Given the extensive scale of planned coal-fired power plants around the world⁴⁰ and accounting for the prevalence of energy-efficient technologies available for natural gas combustion,⁴¹ this is a reasonable assumption. On the other hand, a greater abundance of lower-priced natural gas in global energy markets (supported by U.S. LNG exports) is also expected to increase total energy use and displace some lower-carbon renewable and nuclear energy sources, which will increase GHG emissions in markets where lower-carbon technologies have become relatively cost-effective. Taking all of these factors into consideration, IEA projections^{42, 43} find that greater supplies of natural gas would lead to net annual reductions in global CO₂ emissions of 0.5 percent by 2035.⁴⁴ The report concludes that “while a greater role for natural gas in the global energy mix does bring environmental benefits where it substitutes for other fossil fuels, natural gas cannot on its own provide the answer to the challenge of climate change.”

³⁹ The EIA estimates increases in U.S. CO₂ emissions between 9 and 75 MMt per year, from 2015 to 2035.

⁴⁰ See: <http://www.wri.org/publication/global-coal-risk-assessment>

⁴¹ See: <http://www.c2es.org/technology/factsheet/natural-gas>

⁴² See: <http://www.worldenergyoutlook.org/goldenageofgas/>

⁴³ See: http://www.worldenergyoutlook.org/media/weowebiste/2011/WEO2011_GoldenAgeofGasReport.pdf

⁴⁴ In their 2011 special report on natural gas, the IEA estimated that the GAS Scenario would lead to 35.3 gigatonnes (Gt) energy-related CO₂ emissions in 2035, with annual reduction of 160 million metric tons (MMt), in that year (compared to their “New Policies Scenario”). In their 2012 special report, the IEA reached a similar conclusion, estimating 184 MMt of annual reductions in global energy-related CO₂ emissions in 2035 with their “Golden Rules Case” (compared to a baseline), with global emissions rising to 36.8 gigatonnes (Gt) in the same year.

In summary, available evidence suggests that LNG exports from the U.S. would marginally reduce global CO₂ emissions, although the scale of these estimated GHG emissions savings is an order of magnitude lower than the total projected levels of global methane emissions from natural gas and oil systems.⁴⁵ Meanwhile, it appears very likely that LNG exports from U.S. terminals would result in increased domestic GHG emissions from both upstream and downstream sources.

These expected outcomes should raise the bar for policymakers and industry to more actively work to achieve continuous improvement in GHG emissions from all life cycle stages of natural gas development and use. Our research shows that reducing fugitive methane can be highly cost-effective – beneficial to customers and companies alike – and it is necessary if natural gas and LNG exports are to be part of the solution to our climate change problem, both in the U.S. and internationally.

Progress is Being Made but There is More Work to Be Done

Now for the good news. Increased attention to the air emissions issue has resulted in significant recent progress toward reducing air pollution from natural gas systems.

In April 2012 EPA finalized regulations for New Source Performance Standards (NSPS) and National Emissions Standards for Hazardous Air Pollutants (NESHAP) that primarily target

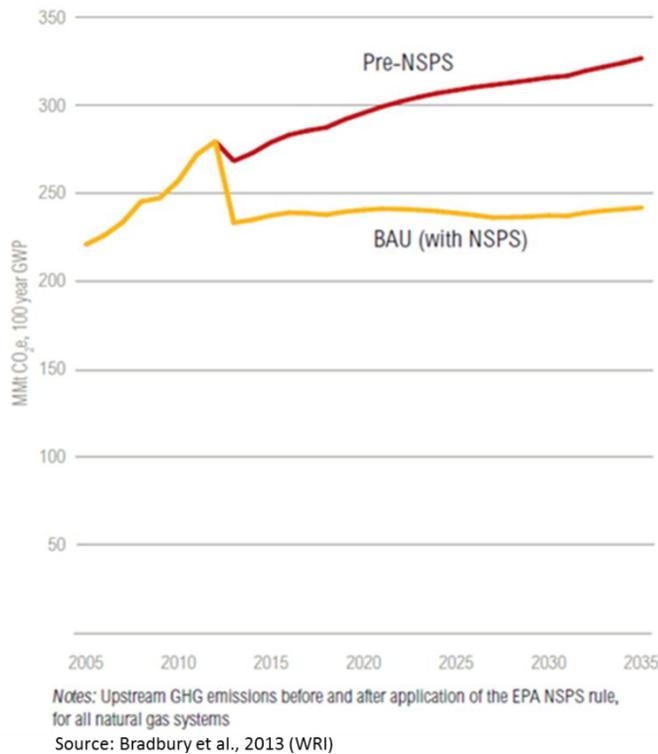
⁴⁵ By way of comparison, the EPA estimates that global annual fugitive methane emissions from natural gas and oil systems in 2030 will exceed 2,500 MMT carbon dioxide equivalent (CO₂e), assuming a GWP of 25, over a 100 year time frame (see: <http://www.epa.gov/climatechange/EPAactivities/economics/nonco2projections.html>). The U.S. GHG inventory estimates that fugitive methane emissions from U.S. natural gas systems in 2011 were just over 170 MMT CO₂e.

VOCs and air toxics emissions but will have the co-benefit of reducing methane emissions. The new EPA rules require “green completions,” which reduce emissions during the flow-back stage of all hydraulic fracturing operations at new and re-stimulated natural gas wells. The rules will also reduce leakage rates for compressors, controllers, and storage tanks.

EPA should be applauded for establishing these public health protections. Minimum federal standards for environmental performance are a necessary and appropriate framework for addressing cross-boundary pollution issues like air emissions. Federal Clean Air Act regulations are generally developed in close consultation with industry and state regulators and are often implemented by states. This framework allows adequate flexibility to enable state policy leadership and continuous improvement in environmental protection over time.

In our recent working paper, WRI estimated that these new rules will reduce methane emissions enough to cut all upstream GHG emissions from natural gas systems (including shale gas) by 13 percent in 2015 and 25 percent by 2035. As can be seen in Figure 3 below, the NSPS/NESHAP rules will make a big difference by helping to avoid a rise in upstream GHG emissions that would otherwise be likely given the projected growth in domestic natural gas production. The figure also shows that upstream carbon dioxide and methane emissions will remain a significant problem without further action.

Figure 3: Upstream GHG Emissions from All Natural Gas Systems, 2006 to 2035



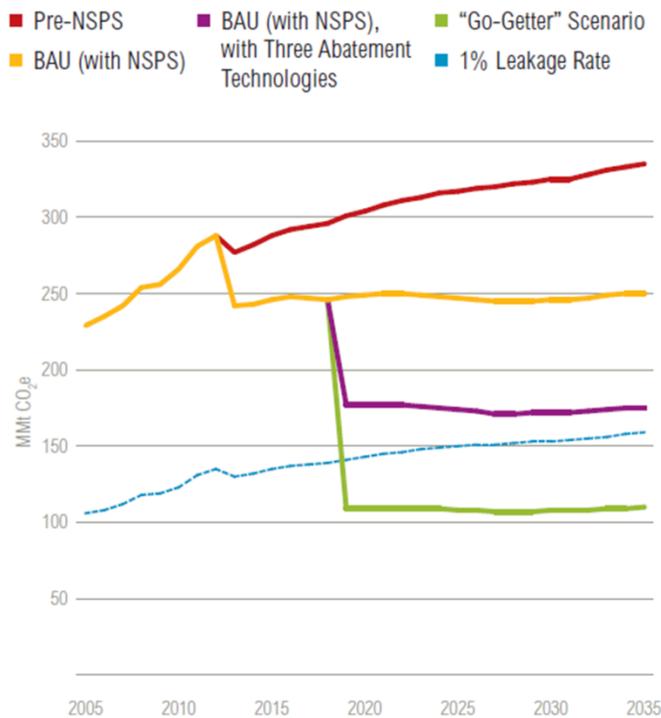
Further Potential to Reduce Fugitive Methane Emissions

WRI estimates that by implementing just three technologies that capture or avoid fugitive methane emissions, upstream methane emissions across all natural gas systems could be cost-effectively cut by up to an additional 30 percent (see Figure 4, below). The technologies include (a) fugitive methane leak monitoring and repair at new and existing well sites, processing plants, and compressor stations; (b) replacing existing high-bleed pneumatic devices with low-bleed equivalents throughout natural gas systems; and (c) use of plunger lift systems⁴⁶ at new and existing wells during liquids unloading operations. By our estimation, these three steps would

⁴⁶ Note: new data from the most recent EPA emissions inventory suggests that these technologies are much more widely used than previously thought. See: <http://insights.wri.org/news/2013/05/5-reasons-why-its-still-important-reduce-fugitive-methane-emissions>

bring down the total life cycle leakage rate across all natural gas systems to just above 1 percent of total production. Through adoption of five additional abatement measures that each address smaller emissions sources (i.e., a “Go-Getter” Scenario), the 1 percent goal would be readily achieved. All eight of these technologies could be implemented cost-effectively with payback periods of three years or less.

Figure 4: Upstream GHG Emissions from All Natural Gas Systems; with Additional Abatement Scenarios



Source: Bradbury et al., 2013

Policy Recommendations

New public policies will be needed to reduce methane emissions from both new and existing equipment throughout U.S. natural gas systems. WRI research has found that market conditions alone are not sufficient to compel industry to adequately or quickly adopt available best

practices. To the members of this committee, I recommend the following actions to help EPA and states cost-effectively reduce air emissions from natural gas systems.

Expand applied technology research. Efforts to reduce upstream GHG emissions from natural gas systems could be aided by applied technology research at DOE. Such research should be expanded, with a focus on advancement of technologies to reduce the cost of leak detection, improve emissions measurements, and develop new and lower-cost methane emission reduction strategies.

Update emissions factors for key processes. To help resolve questions regarding the scale of methane emissions from U.S. natural gas infrastructure and operations – and to inform critical domestic and international climate and energy policy decisions – the oil and gas sector should be required to directly measure and report their emissions, with results subject to independent verification and public disclosure.

Assist with environmental regulations. With more funding, the organization STRONGER (State Review of Oil and Natural Gas Environmental Regulations) could provide more states with timely assistance in developing and evaluating environmental regulations, including (but not limited to) those designed to reduce air pollution.

Support best practices. With more funding, EPA could do more through Natural Gas STAR and other programs to recognize companies that demonstrate a commitment to best practices. This program could further encourage voluntary industry actions by maintaining a clearinghouse for

technologies and practices that reduce all types of air emissions from the oil and natural gas sector.⁴⁷

Provide technical and regulatory assistance. Recognizing the central role of state governments in achieving federal National Ambient Air Quality Standards, with more funding EPA could provide targeted technical and regulatory assistance to states with expanding oil and natural gas development. One example of a successful model that could be expanded is EPA's Ozone Advance Program. States concerned about smog and other air quality problems associated with oil and gas development voluntarily engage with this program, resulting in the co-benefit of reduced methane emissions.

Reduce carbon dioxide emissions. Broader action is also needed on policies supporting clean energy and addressing climate change. A clean energy standard or putting a price on carbon would provide clear signals to energy markets that energy providers and users need to recognize the environmental and social costs as well as the direct economic costs of energy resources.

Conclusions

Some advocate for a free-market approach to managing energy production, transmission, and use. While I agree with the general virtues of free markets, I would also caution that there is no free lunch. The National Research Council has identified very significant costs associated with

⁴⁷ An example of one existing clearinghouse can be found here: <http://cfpub.epa.gov/RBLC/>

fossil energy use that are hidden to most U.S. consumers.⁴⁸ Society pays when our health-care premiums rise due to harmful health effects caused by high ozone levels and other air pollution; taxpayers pick up the tab for climate change when the frequency and intensity of extreme weather events causes increasing damage to our communities and critical infrastructure.

Others highlight the energy and national security benefits of natural gas exports, which may reduce the political and economic influence of countries that do not share common interests with the U.S. and our allies. While such geopolitical benefits may be realized, LNG exports will do little to help avoid dangerous levels of climate change. We could also improve our geopolitical standing by demonstrating leadership in achieving greenhouse gas emissions reductions, much of which can be accomplished cost-effectively and with net benefits to the economy – starting with the policy actions recommended above. Meanwhile, the more we invest in fossil energy resources and infrastructure while delaying policy actions to significantly reduce GHG pollution, the more we expose ourselves and our allies to the destabilizing effects of climate change. In its 2010 Quadrennial Defense Review, the Department of Defense found that “climate change could have significant geopolitical impacts around the world.” The same report concludes that climate change could further weaken fragile governments and contribute to food scarcity, spread of disease, and mass migration. Meanwhile, 30 military installations already face elevated risk from sea-level rise.

⁴⁸ NRC (National Research Council). 2010. “Hidden Costs of Energy: Unpriced Consequences of Energy Production and Use.” Washington, DC: The National Academies Press. Available at: http://www.nap.edu/catalog.php?record_id=12794.

Every day that we take no policy action on climate change, we make the policy choice to let climate change run its course. This ignores the overwhelming consensus of climate scientists who have been warning for decades that rising GHG emissions will cause the planet to warm, sea levels to rise, and weather to become more extreme. It is indisputable that these climate changes are happening today, and in many cases much more quickly than expected. Action is urgently needed.

Coal to gas: the influence of methane leakage

Tom M. L. Wigley

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Abstract Carbon dioxide (CO₂) emissions from fossil fuel combustion may be reduced by using natural gas rather than coal to produce energy. Gas produces approximately half the amount of CO₂ per unit of primary energy compared with coal. Here we consider a scenario where a fraction of coal usage is replaced by natural gas (i.e., methane, CH₄) over a given time period, and where a percentage of the gas production is assumed to leak into the atmosphere. The additional CH₄ from leakage adds to the radiative forcing of the climate system, offsetting the reduction in CO₂ forcing that accompanies the transition from coal to gas. We also consider the effects of: methane leakage from coal mining; changes in radiative forcing due to changes in the emissions of sulfur dioxide and carbonaceous aerosols; and differences in the efficiency of electricity production between coal- and gas-fired power generation. On balance, these factors more than offset the reduction in warming due to reduced CO₂ emissions. When gas replaces coal there is additional warming out to 2,050 with an assumed leakage rate of 0%, and out to 2,140 if the leakage rate is as high as 10%. The overall effects on global-mean temperature over the 21st century, however, are small.

Hayhoe et al. (2002) have comprehensively assessed the coal-to-gas issue. What has changed since then is the possibility of substantial methane production by high volume hydraulic fracturing of shale beds (“fracking”) and/or exploitation of methane reservoirs in near-shore ocean sediments. Fracking, in particular, may be associated with an increase in the amount of attendant gas leakage compared with other means of gas production (Howarth et al. 2011). In Hayhoe et al., the direct effects on global-mean temperature of differential gas leakage between coal and gas production are very small (see their Fig. 4). Their estimates of gas

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leakage, however, are less than more recent estimates. Here, we extend and update the analysis of Hayhoe et al. to examine the potential effects of gas leakage on the climate, and on uncertainties arising from uncertainties in leakage percentages.

We begin with a standard “no-climate-policy” baseline emissions scenario, viz. the MiniCAM Reference scenario (MINREF below) from the CCSP2.1a report (Clarke et al. 2007). (Hayhoe et al. used the MiniCAM A1B scenario, Nakićenović and Swart 2000.) We chose MINREF partly because it is a more recent “no-policy” scenario, but also because there is an extended version of MINREF that runs beyond 2,100 out to 2,300 (Wigley et al. 2009). The longer time horizon is important because of the long timescales involved in the carbon cycle where changes to CO₂ emissions made in the 21st century can have effects extending well into the 22nd century. (A second baseline scenario, the MERGE Reference scenario from the CCSP2.1a report, is considered in the [Electronic Supplementary Material](#)).

In MINREF, coal combustion provides from 38% (in 2010) to 51% (in 2100) of the emissions of CO₂ from fossil fuels. (The corresponding percentages for gas are 19 to 21%, and for oil are 43 to 28%.) For our coal-to-gas scenario we start with their contributions to energy. It is important here to distinguish between primary energy (i.e., the energy content of the resource) and final energy (the amount of energy delivered to the user at the point of production). For a transition from coal to gas, we assume that there is no change in final energy. As electricity generation from gas is more efficient than coal-fired generation, the increase in primary energy from gas will be less than the decrease in primary energy from coal — the differential depends on the relative efficiencies with which energy is produced.

To calculate the change in fossil CO₂ emissions for any transition scenario we use the following relationship relating CO₂ emissions to primary energy (P)...

$$ECO_2 = A P_{\text{coal}} + B P_{\text{oil}} + C P_{\text{gas}} \quad (1)$$

where A, B and C are representative emissions factors (emissions per unit of primary energy) for coal, oil and gas. The emissions factors relative to coal that we use are 0.75 for oil and 0.56 for gas, based on information in EPA’s AP-42 Report (EPA 2005). Using the MINREF emissions for CO₂ and the published primary energy data give a best fit emissions factor for coal of 0.027 GtC/exajoule, well within the uncertainty range for this term.

To determine the change in CO₂ emissions in moving from coal to gas under the constraint of no change in final energy we use the equivalent of Eq. (1) expressed in terms of final energy (F). This requires knowing the efficiencies for energy production from coal, oil and gas (i.e., final energy/primary energy). If $F = P \times (\text{efficiency})$, then we have

$$ECO_2 = (A/a)F_{\text{coal}} + (B/b)F_{\text{oil}} + (C/c)F_{\text{gas}} \quad (2)$$

where a, b and c are the efficiencies for energy production from coal, oil and gas. For changes in final energy (ΔF) in the coal-to-gas case, ΔF_{oil} is necessarily zero. To keep final energy unchanged, therefore, we must have $\Delta F_{\text{gas}} = -\Delta F_{\text{coal}}$. Hence, from Eq. (2)

...

$$\Delta ECO_2 = (\Delta F_{\text{coal}})(A/a - C/c) \quad (3)$$

or ...

$$\Delta ECO_2 = A \Delta P_{\text{coal}} [1 - (C/A)/(c/a)] \quad (4)$$

As ΔP_{coal} is negative, the first term here is the reduction in CO₂ emissions from the reduction in coal use, while the second term is the partially compensating increase in CO₂

emissions from the increase in gas use. Our best-fit value for A is 0.027 GtC/exajoule, and $C/A=0.56$. To apply Eq. (4) we need to determine a reasonable value for the relative gas-to-coal efficiency ratio (c/a), which we assume does not change appreciably over time. For electricity generation, the primary sector for coal-to-gas substitution, Hayhoe et al. (2002, Table 2) give representative efficiencies of 32% for coal and 60% for gas. Using these values, Eq. (4) becomes ...

$$\Delta E_{CO_2} = 0.027 \Delta P_{coal}[1 - 0.299] \quad (5)$$

for ΔE_{CO_2} in GtC and ΔP in exajoules. Thus, for a unit reduction in coal emissions, there is an increase in emissions from gas combustion of about 0.3 units.

To complete our calculations, we need to estimate the changes in methane, sulfur dioxide and black carbon emissions that would follow the coal-to-gas conversion. Consider methane first. Methane is emitted to the atmosphere as a by-product of coal mining and gas production. Although these fugitive emissions are relatively small, they are important because methane is a far more powerful forcing agent per unit mass than CO_2 .

For coal mining we use information from Spath et al. (1999; Figs. C1 and C4). A typical US coal-fired power plant emits 1,100 g CO_2 /kWh, with an attendant release of methane of 2.18 g CH_4 /kWh, almost entirely from mining. Thus, for each GtC of CO_2 emitted from a coal-fired power plant, 7.27 Tg CH_4 are emitted from mining. Spath et al. give other information that can be used to check the above result. They give values of 1.91 g CH_4 released per ton of coal mined from surface mines, and 4.23 g CH_4 per ton from deep mines. As 65% of coal comes from deep mines, the weighted average release is 3.42 g CH_4 /ton. Since 1 ton of coal, when burned, typically produces 1.83 kg CO_2 , the amount of fugitive methane per GtC of CO_2 emissions from coal-fired power plants is 6.85 Tg CH_4 /GtC, consistent with the previous result. For our calculations we use the average of these two results, 7.06 Tg CH_4 /GtC; i.e., if CO_2 emissions from coal-fired power generation are reduced by 1 GtC, we assume a concomitant decrease in CH_4 emissions of 7.06 Tg CH_4 . We assume that this value for the USA is applicable for other countries.

For leakage associated with gas extraction and transport we note that every kg of gas burned produces 12/16 kgC of CO_2 . If the leakage rate is “p” percent, then, for any given increase in CO_2 emissions from gas combustion, the amount of fugitive methane released is $(p/100) (16/12) 1000 = 13.33 (p) TgCH_4/GtC$. For a leakage rate of 2.5%, for example (roughly the present leakage rate for conventional gas extraction), this is 33.3 Tg CH_4 /GtC. Because the CO_2 emissions change from gas combustion is much less than that for coal (about 30%; see Eq. (5)), for the 2.5% leakage case this would make the coal mining and gas leakage effects on CH_4 quite similar (but of opposite sign), in accord with Hayhoe et al. (2002, Table 1).

SO_2 emissions are important because coal combustion produces substantial SO_2 , whereas SO_2 emissions from gas combustion are negligible. Reducing energy production from coal has compensating effects — reduced CO_2 emissions leads to reduced warming in the long term, but this is offset by the effects of reduced SO_2 emissions which lead to lower aerosol loadings in the atmosphere and an attendant warming (Wigley 1991). For CO_2 and SO_2 , emissions factors for coal (from Hayhoe et al. 2002, Table 1) are 25 kgC/GJ and 0.24 kgS/GJ. For each GtC of CO_2 produced from coal combustion, therefore, there will be 19.2 TgS of SO_2 emitted. We can check this using emissions factors from Spath et al. (1999, Figs. C1 and C2). For a typical coal-fired power plant these are 7.3 g SO_2 /kWh and 1,100 g CO_2 /kWh. Hence, for each GtC of CO_2 produced from coal combustion, SO_2 emissions will be 12.17 TgS. Effective global emissions factors can also be obtained from

published emissions scenarios. For example, for changes over 2000 to 2010 in the MINREF scenario, the emissions factor for coal combustion is approximately 11.6 TgS/GtC.

From these different estimates it is clear that there is considerable uncertainty in the SO₂ emissions factor, echoing in part the widely varying sulfur contents in coal. Furthermore, for future emissions from coal combustion the SO₂ emissions factor is likely to decrease markedly due to the imposition of SO₂ pollution controls (as explained, for example, in Nakićenović and Swart 2000). It is difficult to quantify this effect, a difficulty highlighted, for example, by the fact that, in the second half of the 21st century, many published scenarios show increasing CO₂ emissions, but decreasing SO₂ emissions — with large differences between scenarios in the relative changes.

For the coal-to-gas transition, it is not at all clear how to account for the effects that SO₂ pollution controls, that will likely go on in parallel with any transition from coal to gas, will have on the SO₂ emissions factor. However, future coal-fired plants will certainly employ such controls, so emissions factors for SO₂ will decrease over time. To account for this we assume a value of 12 TgS/GtC for the present (2010) declining linearly to 2 TgS/GtC by 2,060 and remaining at this level thereafter. This limit and the attainment date are consistent with the fact that many of the SRES scenarios tend to stabilize SO₂ emissions at a finite, non-zero value at around this time.

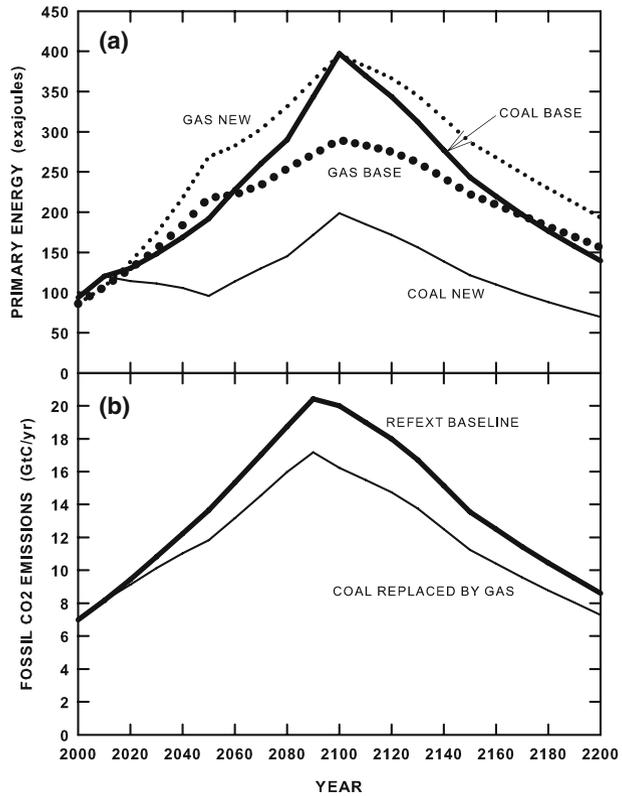
For black carbon (BC) aerosol emissions we use the relationship between BC and SO₂ emissions noted by Hayhoe et al. (2002, p. 125) and make BC forcing proportional to SO₂ emissions. Using best-estimate forcings from the IPCC Fourth Assessment Report, this means that the increase in sulfate aerosol forcing changes due to SO₂ emissions reductions are reduced by approximately 30% by the attendant changes in BC emissions. This is a larger BC effect than in Hayhoe et al. However, compared with the large overall uncertainty in aerosol forcing, the difference between what we obtain here and the results of Hayhoe et al. are relatively small.

For our coal-to-gas emissions scenario we assume that primary energy from coal is reduced linearly (in percentage terms) by 50% over 2010 to 2050 (1.25%/yr), and that the reduction in final energy is made up by extra energy from gas combustion. (A second, more extreme scenario is considered in the [Electronic Supplementary Material](#)). In this way, there are no differences in final energy between the MINREF baseline scenario and the coal-to-gas perturbation scenario. Hayhoe et al. consider scenarios where coal production reduces by 0.4, 1.0 and 2.0%/yr over 2000 to 2025. After 2050 we assume no further percentage reduction in coal-based energy (i.e., the reduction in emissions from coal relative to the baseline scenario remains at 50%). This is an idealized scenario, but it is sufficiently realistic to be able to assess the relative importance of different gas leakage rates. We consider leakage rates of zero to 10%,

Baseline and perturbed (coal to gas) primary energy scenarios for coal and gas are shown in Fig. 1, together with the corresponding fossil-fuel CO₂ emissions. The changes in primary energy breakdown are large: e.g., in 2100, primary energy from coal is 37% more than from gas in the baseline case, but 50% less than gas in the perturbed case. The corresponding reduction in emissions is less striking. In the perturbed case, 2100 emissions are reduced only by 19%. (Cases where there are larger emissions reductions are considered in the [Electronic Supplementary Material](#)).

To determine the consequences of the coal-to-gas scenario we use the MAGICC coupled gas-cycle/upwelling-diffusion climate model (Wigley et al. 2009; Meinshausen et al. 2011). These are full calculations from emissions through concentrations and radiative forcing to global-mean temperature consequences. We do not make use of Global Warming Potentials (as in Howarth et al. 2011, for example), which are a poor substitute for a full calculation

Fig. 1 **a** Primary energy scenarios. Baseline data to 2100 are from the CCSP2.1a MiniCAM Reference scenario. After 2100, baseline primary energy data have been constructed to be consistent with emissions data in the extended MiniCAM Reference scenario (Wigley et al. 2009 — REFEXT). Full lines are for coal, dotted lines are for gas. “NEW” data correspond to the coal-to-gas scenario. Under the final energy constraint that $\Delta F_{\text{gas}} = -\Delta F_{\text{coal}}$, $\Delta P_{\text{gas}} = -(a/c) \Delta P_{\text{coal}} = -0.533 \Delta P_{\text{coal}}$. **b** Corresponding fossil CO₂ emissions data



(see, e.g., Smith and Wigley 2000a, b). MAGICC considers all important radiative forcing factors, and has a carbon cycle model that includes climate feedbacks on the carbon cycle. Methane lifetime is affected by atmospheric loadings on methane, carbon monoxide, nitrogen oxides (NO_x) and volatile organic compounds. The effects of methane on tropospheric ozone and stratospheric water vapor are considered directly. For component forcing values we use central estimates as given in the IPCC Fourth Assessment Report (IPCC 2007, p.4). We also assume a central value for the climate sensitivity of 3°C equilibrium warming for a CO₂ doubling. (A second case using a higher sensitivity is considered in the [Electronic Supplementary Material](#)).

Figure 2 shows the relative and total effects of the coal-to-gas transition for a leakage rate of 5%. This is within the estimated leakage rate range (1.7–6.0%; Howarth et al. 2011) for conventional methane production (the effects of well site leakage, liquid uploading and gas processing, and transport, storage and processing). For methane from shale, Howarth et al. estimate an additional leakage of 1.9% (their Table 2) with a range of 0.6–3.2% (their Table 1). The zero to 10.0% leakage rate range considered here spans these estimates — although we note that the high estimates of Howarth et al. have been criticized (Ridley 2011, p. 30).

The top panel of Fig. 2 shows that the effects of CH₄ leakage and reduced aerosol loadings that go with the transition from coal to gas can appreciably offset the effect of reduced CO₂ concentrations, potentially (see Fig. 3) until well into the 22nd century. For the leakage rate ranges considered here, however, the overall effects of the coal to

gas transition on global-mean temperature are very small throughout the 21st century, both in absolute and relative terms (see Fig. 2a). This is primarily due to the relatively small reduction in CO₂ emissions that is effected by the transition away from coal (see Fig. 1b). Cases where the CO₂ emissions reductions are larger (due to a more extreme substitution scenario, or a different baseline) are considered in the [Electronic Supplementary Material](#). The relative contributions to temperature change are similar, but the magnitudes of temperature change scale roughly with the overall reduction in CO₂ emissions.

Figure 3 shows the sensitivity of the temperature differential to the assumed leakage rate. The CO₂ and aerosol terms are independent of the assumed leakage rate, so we only show the methane and total-effect results. These results are qualitatively similar to those of Hayhoe et al. who considered only a single leakage rate case (corresponding approximately to our 2.5% leakage case). For leakage rates of more than 2%, the methane leakage contribution is positive (i.e., replacing coal by gas produces higher methane concentrations) — see the “CH₄ COMPONENT” curves in Fig. 3. Depending on leakage rate, replacing coal by gas leads, not to cooling, but to additional warming out to between 2,050 and 2,140. Initially, this is due mainly to the influence of SO₂ emissions changes, with the effects of CH₄ leakage becoming more important over time. Even with zero leakage from gas production, however, the cooling that eventually arises from the coal-to-gas transition is only a few tenths of a degC (greater for greater climate sensitivity — see [Electronic Supplementary Material](#)). Using climate amelioration as an argument for the

Fig. 2 **a** Baseline global-mean warming (*solid bold line*) from the extended CCSP2.1a Mini-CAM reference scenario together with the individual and total contributions due to reduced CO₂ concentrations, reduced aerosol loadings and increased methane emissions for the case of 5% methane leakage. The *bold dashed line* gives the result for all three components, the *dotted line* shows the effect of CO₂ alone. The *top two thin lines* show the CH₄ and aerosol components. **b** Detail showing differences from the baseline

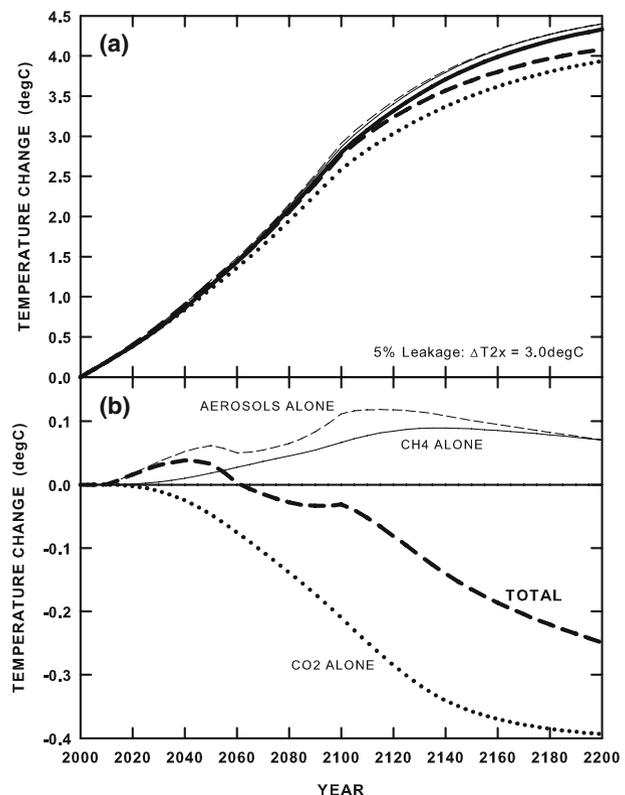
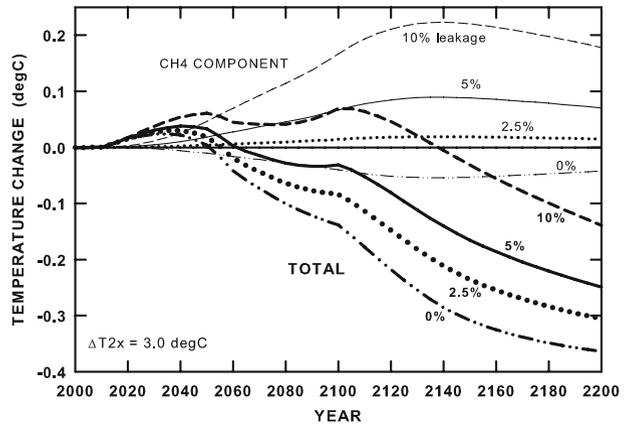


Fig. 3 The effects of different methane leakage rates on global-mean temperature. The *top four curves* (CH4 COMPONENT) show the effects of methane concentration changes, while the *bottom four curves* (TOTAL) show the total effects of methane concentration changes, aerosol changes and CO₂ concentration changes. The latter two effects are independent of the leakage rate, and are shown in Fig. 2. Results here are for a climate sensitivity of 3.0°C



transition is, at best, a very weak argument, as noted by Hayhoe et al. (2002), Howarth et al. (2011) and others.

In summary, our results show that the substitution of gas for coal as an energy source results in increased rather than decreased global warming for many decades — out to the mid 22nd century for the 10% leakage case. This is in accord with Hayhoe et al. (2002) and with the less well established claims of Howarth et al. (2011) who base their analysis on Global Warming Potentials rather than direct modeling of the climate. Our results are critically sensitive to the assumed leakage rate. In our analysis, the warming results from two effects: the reduction in SO₂ emissions that occurs due to reduced coal combustion; and the potentially greater leakage of methane that accompanies new gas production relative to coal. The first effect is in accord with Hayhoe et al. In Hayhoe et al., however, the methane effect is in the opposite direction to our result (albeit very small). This is because our analyses use more recent information on gas leakage from coal mines and gas production, with greater leakage from the latter. The effect of methane leakage from gas production in our analyses is, nevertheless, small and less than implied by Howarth et al.

Our coal-to-gas scenario assumes a linear decrease in coal use from zero in 2010 to 50% reduction in 2050, continuing at 50% after that. Hayhoe et al. consider linear decreases from zero in 2000 to 10, 25 and 50% reductions in 2025. If these authors assumed constant reduction percentages after 2025, then their high scenario is very similar to our scenario.

In our analyses, the temperature differences between the baseline and coal-to-gas scenarios are small (less than 0.1°C) out to at least 2100. The most important result, however, in accord with the above authors, is that, unless leakage rates for new methane can be kept below 2%, substituting gas for coal is not an effective means for reducing the magnitude of future climate change. This is contrary to claims such as that by Ridley (2011) who states (p. 5), with regard to the exploitation of shale gas, that it will “accelerate the decarbonisation of the world economy”. The key point here is that it is not decarbonisation *per se* that is the goal, but the attendant reduction of climate change. Indeed, the shorter-term effects are in the opposite direction. Given the small climate differences between the baseline and the coal-to-gas scenarios, decisions regarding further exploitation of gas reserves should be based on resource availability (both gas and water), the economics of extraction, and environmental impacts unrelated to climate change.

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Greenhouse gases, climate change and the transition from coal to low-carbon electricity

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Greenhouse gases, climate change and the transition from coal to low-carbon electricity

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Abstract

A transition from the global system of coal-based electricity generation to low-greenhouse-gas-emission energy technologies is required to mitigate climate change in the long term. The use of current infrastructure to build this new low-emission system necessitates additional emissions of greenhouse gases, and the coal-based infrastructure will continue to emit substantial amounts of greenhouse gases as it is phased out. Furthermore, ocean thermal inertia delays the climate benefits of emissions reductions. By constructing a quantitative model of energy system transitions that includes life-cycle emissions and the central physics of greenhouse warming, we estimate the global warming expected to occur as a result of build-outs of new energy technologies ranging from 100 GW_e to 10 TW_e in size and 1–100 yr in duration. We show that rapid deployment of low-emission energy systems can do little to diminish the climate impacts in the first half of this century. Conservation, wind, solar, nuclear power, and possibly carbon capture and storage appear to be able to achieve substantial climate benefits in the second half of this century; however, natural gas cannot.

Keywords: climate change, bulk electricity supply, central-station greenhouse gas emissions, electricity, climate

 Online supplementary data available from stacks.iop.org/ERL/7/014019/mmedia

1. Introduction

Hoffert *et al* [1] estimated that if economic growth continues as it has in the past, 10–30 TW of carbon-neutral primary power must be deployed by 2050 to meet global energy demand while stabilizing CO₂ concentrations at 450 ppmv, and that even more rapid deployment of new technologies would need to occur in the second half of this century. Pacala and Socolow [2] have suggested that a broad portfolio of existing technologies could put us on a trajectory toward stabilization in the first half of this century. No previous study, however, has predicted the climate effects of energy system transitions.

Fossil fuels, such as coal and natural gas, emit greenhouse gases when burned in conventional power plants. Concern about climate change has motivated the deployment of lower-GHG-emission (LGE) power plants, including wind, solar photovoltaics (PV), nuclear, solar thermal, hydroelectric, carbon capture and storage, natural gas and other energy technologies with low GHG emissions. Electricity generation accounts for approximately 39% of anthropogenic carbon dioxide emissions [3, 4].

Because LGE power plants have lower operating emissions, cumulative emissions over the lifetime of the plants are lower than for conventional fossil-fueled plants of equivalent capacity. LGE power plants typically require greater upfront emissions to build, however. Consequently,

rapid deployment of a fleet of LGE power plants could initially increase cumulative emissions and global mean surface temperatures over what would occur if the same net electrical output were generated by conventional coal-fired plants. Our results show that most of the climate benefit of a transition to LGE energy systems will appear only after the transition is complete. This substantial delay has implications for policy aimed at moderating climate impacts of the electricity generation sector.

2. Models of LGE energy system build-outs

To make our assumptions clear and explicit, we used simple mathematical models to investigate the transient effects of energy system transitions on GHG concentrations, radiative forcing and global mean temperature changes. We represent an electric power plant's life in two phases: construction and operation. Our model assumes that each plant produces a constant annual rate of GHG emissions as it is constructed and a different constant emission rate as it operates. Emission rates were taken from the literature (see table S1 in the supplementary online material (SOM) available at stacks.iop.org/ERL/7/014019/mmedia). IPCC-published formulas for the atmospheric lifetime of GHGs [5] are used to model increases in atmospheric GHG concentrations that result from the construction and operation of each power plant (see SOM text SE1 for details). Radiative forcing as a function of time, $\Delta F(t)$, follows directly from GHG concentration using expressions from the IPCC [5].

We estimated the change in surface temperature, ΔT by using a simple energy-balance model. The radiative forcing ΔF supplies additional energy into the system. Radiative losses to space are determined by a climate feedback parameter, λ . We used $\lambda = 1.25 \text{ W m}^2 \text{ K}^{-1}$ [6–8], which yields an equilibrium warming of 3.18 K resulting from the radiative forcing that follows a doubling of atmospheric CO_2 from 280 to 560 ppmv. The approach to equilibrium warming is delayed by the thermal inertia of the oceans. We represented the oceans as a 4 km thick, diffusive slab with a vertical thermal diffusivity $k_v = 10^{-4} \text{ m}^2 \text{ s}^{-1}$ [8]. Other parameter choices are possible, but variations within reason would not change our qualitative results, and this approach is supported by recent tests with three-dimensional models of the global climate response to periodic forcing [9]. Our simple climate model treats direct thermal heating in the same way as radiative heating; heat either mixes downward into the ocean or radiates outward to space. To isolate the effects of a transition to LGE energy systems, we consider GHG emissions from only the power plant transition studied. Initial, steady-state atmospheric GHG concentrations are set to $P_{\text{CO}_2} = 400 \text{ ppmv}$, $P_{\text{CH}_4} = 1800 \text{ ppbv}$, and $P_{\text{N}_2\text{O}} = 320 \text{ ppbv}$, at which $\Delta F = \Delta T = 0$. (Use of other background concentrations for GHGs would not alter our qualitative results (SOM text SE1.3 available at stacks.iop.org/ERL/7/014019/mmedia)).

Although life-cycle estimates of emissions from individual power plants (SOM table S1 available at stacks.iop.org/ERL/7/014019/mmedia) vary, they show a consistent pattern

at both the low and high ends of the range, as seen in figures 1(A) and (B). For renewable plants, peak emissions occur during plant construction. For fossil-fueled plants, in contrast, operating emissions dominate; typically <1% of lifetime plant emissions are attributable to construction. For nuclear plants, both construction and fueling for ongoing operation make substantial contributions to lifetime GHG emissions, although these emissions are far lower than the emissions from coal-fired power plants. The primary GHG emission from hydroelectric plants is methane (CH_4) produced by anaerobic decay of organic matter that is inundated as the reservoir fills [10–12]; the amount emitted varies with local conditions.

To provide a stable supply of electricity, a new power plant must be built as each old power plant nears the end of its useful life. As shown in figures 1(C) and (D), fossil-fueled plants produce a comparatively smooth increase in atmospheric GHG concentrations because emissions during construction are small compared to those from operations. In contrast, the larger contribution during construction of nuclear and renewable power plants produces increased emissions each time a plant of this kind is replaced, yielding a sawtooth trend in atmospheric GHG concentrations for a constant output of electricity.

Construction and operation of a new power plant of any technology modeled here will produce higher atmospheric CO_2 concentrations than would have occurred if no new generating capacity were added. Carbon dioxide poses a special concern because of its long lifetime in the atmosphere. With the exception of dams, carbon dioxide emissions dominate the GHG radiative forcing from power plants. Radiative forcing due to CH_4 and N_2O at any point in time accounts for <1% of the total GHG forcing from wind, solar and nuclear power plants; <5% for coal-fired plants; and <10% for natural gas plants. CH_4 dominates only in the case of hydroelectric power, for which it contributes ~95% of the radiative forcing in the first 20 yr, declining monotonically to ~50% at 70 yr after construction.

We contrasted LGE energy technologies with a high-GHG-emission (HGE) energy technology, namely conventional coal-based electricity production. We define 'HGE warming' to mean the increase in global mean surface temperature that would have been produced by the continued operation of the coal-based HGE energy system. This warming is additional to any temperature increases occurring as a result of past or concurrent emissions from outside the 1 TW_e energy system considered here.

To illustrate the consequences of rapid deployments of new energy systems, we considered emissions from a variety of linear energy system transitions, each of which replaces 1 TW_e of coal-based electricity by bringing new LGE power plants online at a constant rate over a 40 yr period. (1 TW_e is the order of magnitude of the global electrical output currently generated from coal [10].) Existing coal-fired generators were assumed to be new at the onset of the transition, to be replaced with equivalent plants at the end of their lifetime, and to be retired at the rate of new plant additions in order to maintain constant annual output of electricity. Lifetimes

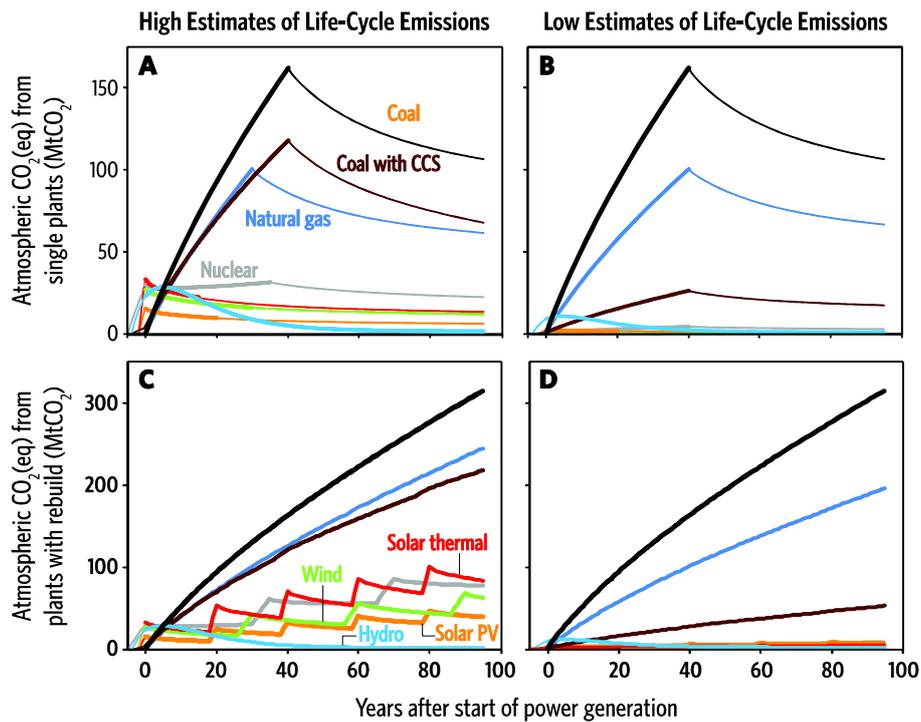


Figure 1. The time evolution of atmospheric CO₂(eq) concentrations resulting from the construction and operation of a 1 GW_e electric power plant varies widely depending on the type of plant. (A), (B) Atmospheric CO₂(eq) concentrations from single power plants of different types based on high (A) and low (B) estimates of life-cycle power plant emissions. Renewable technologies have higher emissions in the construction phase (thin lines prior to year zero); conventional fossil technologies have higher emissions while operating (thick lines); emitted gases persist in the atmosphere even after cessation of operation (thin lines after year zero). The operating life of plants varies by plant type. (C), (D) Atmospheric CO₂(eq) concentrations from the construction of series of power plants built to maintain 1 GW_e output. For high estimates of life-cycle emissions, periodic replacement of aging plants produces pulses of emissions resulting in substantial, step-like change in atmospheric concentrations. However, in all cases except hydroelectric, continued electricity production results in increasing trends of atmospheric CO₂(eq) concentrations.

and thermal efficiencies of the coal plants were taken from the life-cycle analysis (LCA) literature, as were the additional emissions associated with constructing power plants (SOM table S1 available at stacks.iop.org/ERL/7/014019/mmedia). Using GHG emission data from this literature, we calculated time series for emissions, radiative forcing, and temperature for build-outs of eight LGE energy technologies, for a range of rollout durations (SOM text SN3 available at stacks.iop.org/ERL/7/014019/mmedia) including, as a lower bound, the unrealistic case in which all plants are built simultaneously in a single year. Climate consequences of a portfolio of technologies can be approximated by a linear combination of our results for each technology taken individually. For each technology, we examine low and high emission estimates from the LCA literature, and label these ‘Low’ and ‘High’. The time evolution of emissions and temperature increases resulting from an example transition, from coal to natural gas, is illustrated in SOM table S4 (available at stacks.iop.org/ERL/7/014019/mmedia).

We investigated transitions from an HGE energy system to various LGE options for a wide range of transition rates (figure 4). Building on previous life-cycle analyses (SOM table S1 available at stacks.iop.org/ERL/7/014019/mmedia), we estimated the magnitude of most direct and indirect GHG emissions from the construction and operation of

the power plants, including GHG emissions associated with long-distance electricity transmission and thermal emissions attributable to power generation and use (SOM text SN2 available at stacks.iop.org/ERL/7/014019/mmedia). During this transition, GHG emissions attributed to the fleet include both those due to construction or operation of the new technology and those due to coal-fired generators that have not yet been replaced. Various energy system transitions could be imagined. Delaying the transition delays long-term climate benefits of LGE energy. Accelerating the transition decreases total fleet emissions from burning coal, but increases the rate of emissions produced by new construction (figure 4(C)). Qualitatively similar results hold for exponential and logistic growth trajectories (SOM text SD1 and figures S10–12 available at stacks.iop.org/ERL/7/014019/mmedia).

3. Delayed benefits from energy system transitions

By the time any new power plant begins generating electricity, it has incurred an ‘emissions debt’ equal to the GHGs released to the atmosphere during its construction. The size of this debt varies from one LGE technology to another, as does the operating time required to reach a break-even point at which emissions avoided by displacing power from an HGE plant equal the emissions debt. All transitions from coal to other energy technologies thus show higher GHG concentrations

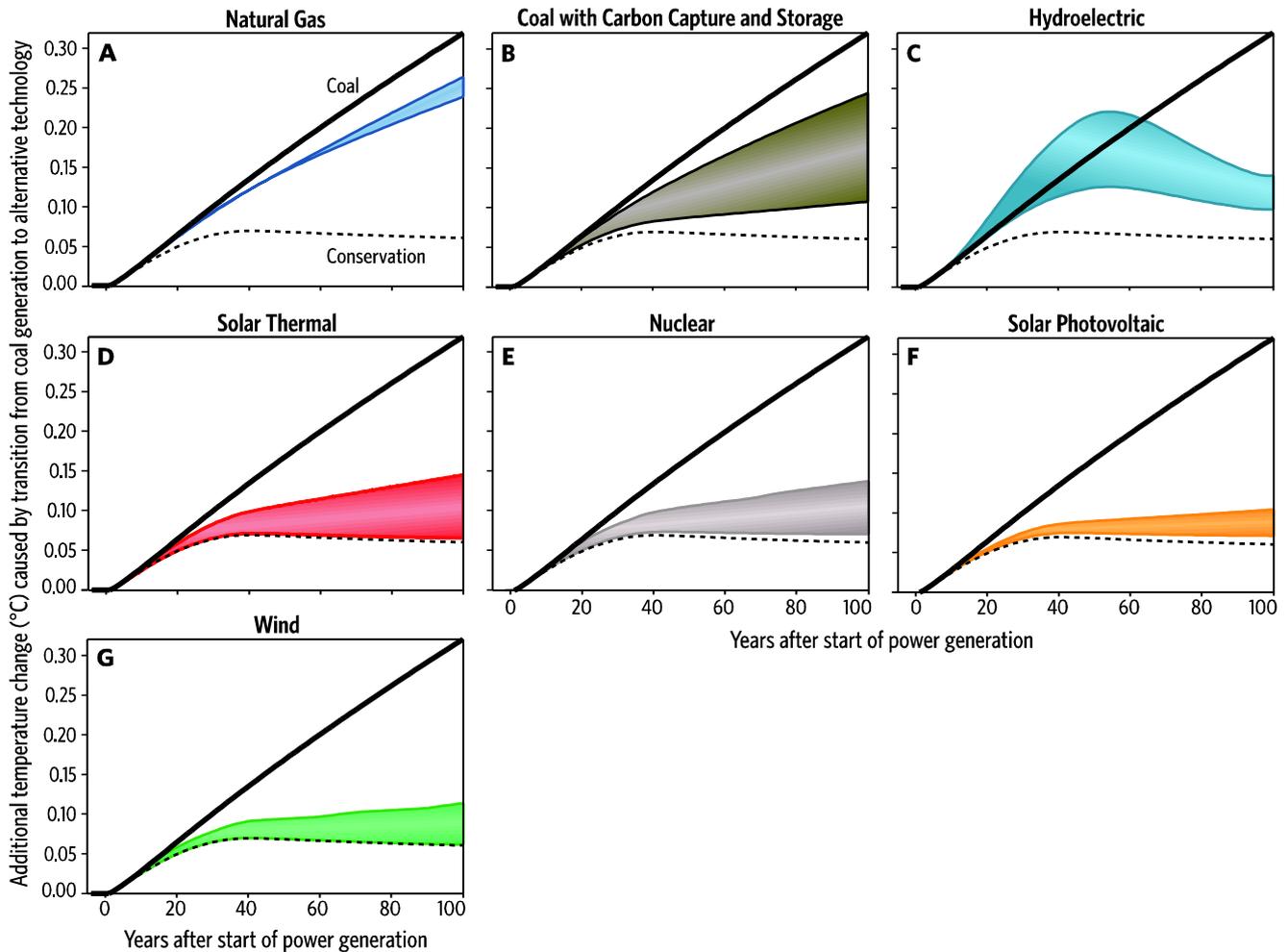


Figure 2. Many decades may pass before a transition from coal-based electricity to alternative generation technologies yields substantial temperature benefits. Panels above show the temperature increases predicted to occur during a 40 yr transition of 1 TW_e of generating capacity. Warming resulting from continued coal use with no alternative technology sets an upper bound (solid black lines), and the temperature increase predicted to occur even if coal were replaced by idealized conservation with zero CO₂ emissions (dashed lines) represents a lower bound. The colored bands represent the range of warming outcomes spanned by high and low life-cycle estimates for the energy technologies illustrated: (A) natural gas, (B) coal with carbon capture and storage, (C) hydroelectric, (D) solar thermal, (E) nuclear, (F) solar photovoltaic and (G) wind.

and temperatures at the outset than would have occurred in the absence of a transition to a new energy system. We calculated, for each technology, the number of years following the start of electricity generation until the transition starts reducing HGE warming, as well as the times at which the transition has reduced HGE warming by 25% or 50%.

Our results (figure 2 and SOM tables S3 and S4 available at stacks.iop.org/ERL/7/014019/mmedia) illustrate the general finding that emerges from our results: energy system transitions cause reductions in HGE warming only once they are well underway, and it takes much longer still for any new system to deliver substantial climate benefits over a conventional coal-based system. It is instructive to examine idealized energy conservation, considered here as a technology that produces electricity with zero GHG emissions. Conservation is thus equivalent to phasing out 1 TW_e of coal power over 40 yr without any replacement technology. Even in this case, GHGs (particularly CO₂) emitted by coal during the phaseout linger in the atmosphere

for many years; in addition, ocean thermal inertia causes temperature changes to lag radiative forcing changes. Consequently, conservation takes 20 yr to achieve a 25% reduction in HGE warming and 40 yr to achieve a 50% reduction.

This idealized rollout of conservation that displaces 1 TW_e of conventional coal power sets a lower bound to the temperature reductions attainable by any technology that does not actively withdraw GHGs from the atmosphere. This lower bound is approached most closely by wind, solar thermal, solar PV and nuclear, using the low LCA estimates; these cases yield temperature increases that exceed the idealized conservation case by only a fraction of a degree, and the time to a 50% reduction in HGE warming is delayed by only a few years. Differences among these same technologies appear, however, if high LCA estimates are used (figure 3). When using the complete range of LCA estimates, for example, our model projects that a 40 yr, linear transition from coal to solar PV would cause a 1.4–6.9 yr period with greater warming than

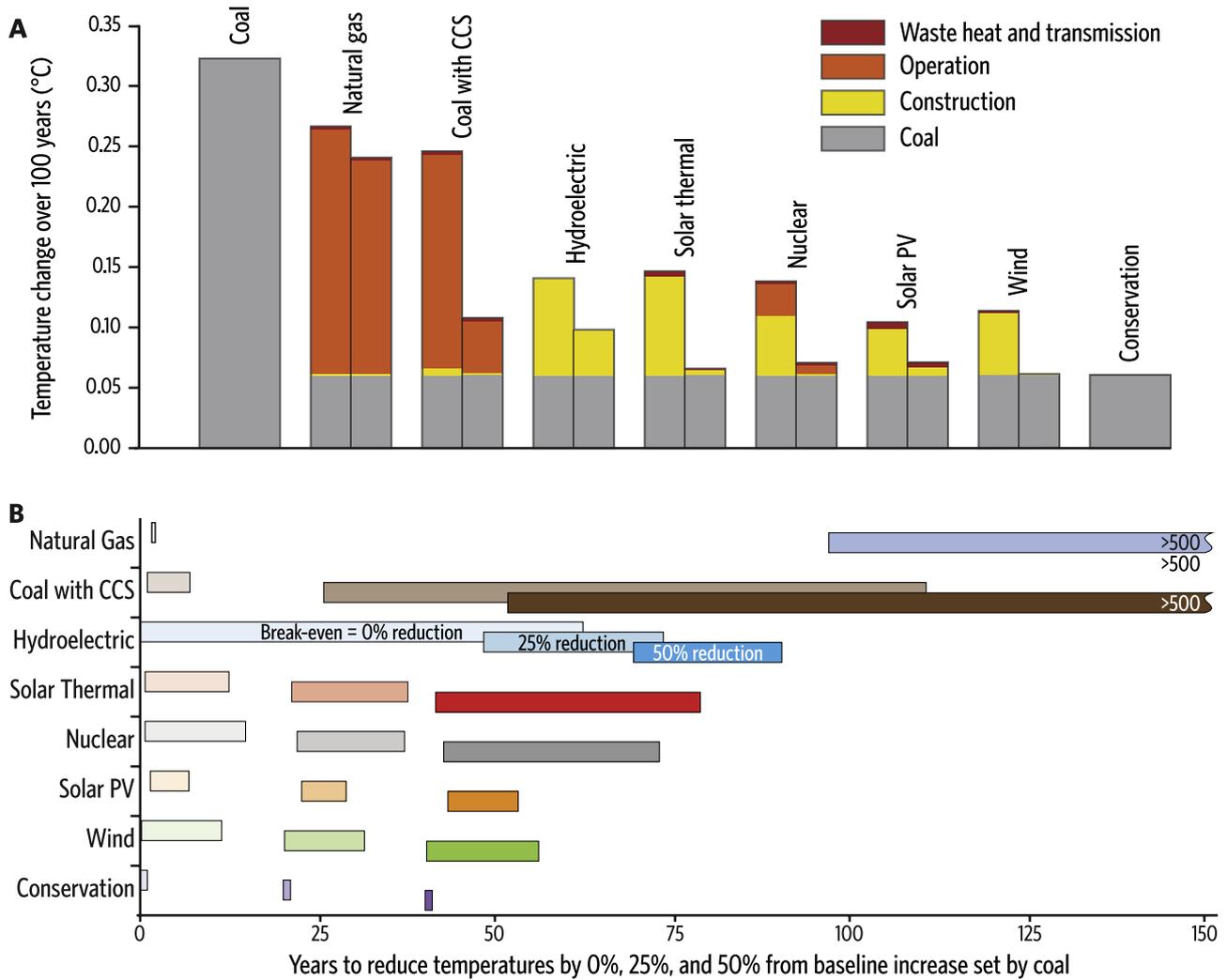


Figure 3. Transitions of 1 TW_e of coal-based electricity generation to lower-emitting energy technologies produces modest reductions in the amount of global warming from GHG emissions; if the transition takes 40 yr to complete, only the lowest-emission technologies can offset more than half of the coal-induced warming in less than a century. (A) Increases in global mean surface temperature attributable to the 1 TW_e energy system 100 yr after the start of a 40 yr transition to the alternative technology. Even if the coal-based system were phased out without being replaced by new power plants of any kind, GHGs released by the existing coal-fired plants during the phaseout would continue to add to global warming (rightmost column). Split columns reflect temperature changes calculated using both high and low emissions estimates from a range of life-cycle analyses, as described in the text and SOM text SN2 (available at stacks.iop.org/ERL/7/014019/mmedia). (B) Time required from the start of power generation by an alternative technology to achieve break-even, warming equal to what would have occurred without the transition from coal (lightest shading); a 25% reduction in warming (medium shading); and a reduction by half (darkest shading) as a result of the transition. The bars span the range between results derived using the lowest and highest LCA estimates of emissions. For numeric values, see SOM table S3 (available at stacks.iop.org/ERL/7/014019/mmedia).

had the transition not been undertaken, and that the transition would take 23–29 yr to produce a 25% reduction in HGE warming and 43–53 yr to avoid half of the HGE warming.

Natural gas plants emit about half the GHGs emitted by coal plants of the same capacity, yet a transition to natural gas would require a century or longer to attain even a 25% reduction in HGE warming (SOM table S3 available at stacks.iop.org/ERL/7/014019/mmedia). Natural gas substitution thus may not be as beneficial in the near or medium term as extrapolation from ‘raw’ annual GHG emissions might suggest.

Carbon capture and storage (CCS) also slows HGE warming only very gradually. Although CCS systems are estimated to have raw GHG emissions of ~17%–~27%

that of unmodified coal plants, replacement of a fleet of conventional coal plants by coal-fired CCS plants reduces HGE warming by 25% only after 26–110 yr. This transition delivers a 50% reduction in 52 years under optimistic assumptions and several centuries or more under pessimistic assumptions.

More generally, any electricity-generating technology that reduces GHG emissions versus coal plants by only a factor of two to five appears to require century-long times to accrue substantial temperature reductions. Comparison of 1 TW_e, 40 yr transitions from coal to a wide range of LGE energy technologies reveals little difference in warming produced by the various technologies until the transition is complete (figures 2(A)–(G)). Although it takes many decades

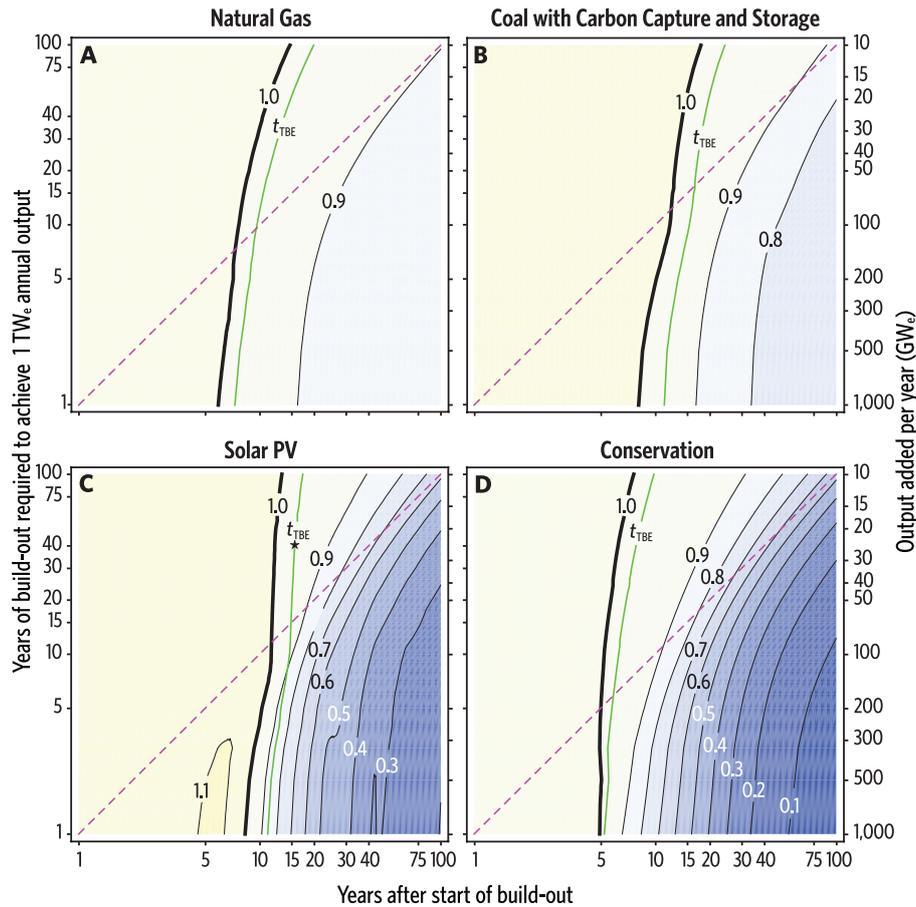


Figure 4. Analysis of a wide range of energy transition rates, scales, and technologies finds that replacement of coal-fired power plants requires many years to deliver climate benefits. For a given alternative energy technology and transition scale, the range of simulation results can be summarized by a contour plot; those above show results for 1 TW_e, linear transitions to (A) natural gas, (B) coal with CCS, (C) solar PV and (D) conservation; high emission estimates from LCA studies were used in each case. For plots of other technologies, transition scales, and build-out trajectories, see SOM figures S10 and S11 (available at stacks.iop.org/ERL/7/014019/mmedia). In these plots, the vertical axis represents the duration of the build-out; results span build-out durations from 1 to 100 yr, which corresponds to annual additions of output ranging from 10 to 1000 GW_e. Contour lines plot the ratio $\Delta T_{\text{new}}/\Delta T_{\text{coal}}$, where ΔT_{new} is the increase in global mean surface temperature projected to result from the transition to the lower-emission technology. Contour lines thus represent the time to achieve reductions in warming ranging from 10% (a ratio of 0.9) to 90% (a ratio of 0.1). Whereas the progress of the build-out (horizontal axis) is measured from the start of power generation in figure 3, here time is measured from the start of construction, which we assume lasts five years before each new plant begins generating. (For ease of comparison, conservation is treated similarly.) Dashed magenta lines indicate the completion of construction of the last plant in the build-outs. The instantaneous break-even point at which $\Delta T_{\text{new}} = \Delta T_{\text{coal}}$ is indicated by thick black curves. A better metric of the break-even time, however, is where the time-averaged integral of ΔT_{new} equals that of ΔT_{coal} (t_{TBE} , green curves). A 40 yr deployment of 1 TW_e of solar PV, for example, would not reach t_{TBE} until year 15 of the build-out (asterisked point).

to achieve substantial benefits from a phaseout of coal-based power plants, instantaneously turning coal plants off without replacing the generating capacity would yield a 50% reduction in HGE warming in 11 yr, as shown in figure 4(D), which plots the reduction in temperature increases to be expected in any given year from elimination of 1 TW_e of coal capacity by build-outs ranging in duration from 1 to 100 yr.

We selected coal-fired plants as the basis for comparison because this energy technology emits the most GHGs per unit electricity generated; replacing plants of this kind thus delivers the greatest climate benefits. If the new technology were instead to replace natural gas plants, then even less CO₂ emission would be avoided, and the times to achieve reductions in warming relative to a natural gas baseline would be even longer than projected here.

4. Effects of scale, duration, technological improvement and bootstrapping

Although we focus here on 40 yr, linear transitions of a 1 TW_e energy system, we examined a far broader range of cases; none of these cases altered our central conclusions. Figure 4, for example, illustrates the HGE warming caused by transitions to several LGE energy technologies that range in duration from 1 to 100 yr. We have simulated transitions ranging from 0.1 to 10 TW_e. In addition to the linear transition presented here, we examined exponential and logistic transitions (SOM texts SD1–SD3 and figures S8, S11–S14 available at stacks.iop.org/ERL/7/014019/mmedia). We also analyzed plausible effects of technological improvement by reducing the emission per unit energy generation over time by

various exponential rates, an approach that effectively forces each technology under study to approach the zero emission case of conservation asymptotically (SOM text SD3 and figure S14 available at stacks.iop.org/ERL/7/014019/mmedia). The analysis reveals that the long timescale required for energy system transitions to reduce temperatures substantially is not sensitive to technological improvement. High rates of technological improvement could alter, however, the relative rank of energy technologies in their abilities to mitigate future warming.

Finally, we examined ‘bootstrapping’ transitions. The exponential, linear and logistic models all assume that generated electricity is used to displace coal and thus lower emissions. A very different strategy is to use a low-GHG-emitting technology to bootstrap itself. This strategy is particularly interesting for wind and solar PV because each of them require substantial amounts of electricity in the manufacturing of key components.

A bootstrapping transition uses electricity from the first plant built to manufacture more plants of the same kind, which in turn provide energy to build new plants, and so on exponentially (SOM text SD2 and figure S13 available at stacks.iop.org/ERL/7/014019/mmedia). In this approach, however, no electricity is turned over to the grid—and thus no coal is replaced—until the build-out goal has been installed and brought online, at which point the coal is displaced all at once. The effect of bootstrapping is thus equivalent to distributing the electrons from PV systems and using coal-generated electrons to construct the PV arrays.

Emissions estimates from the LCA studies we use in our principal analysis, in contrast, assume carbon intensities lower than that of coal-based electricity and thus lower emissions than would occur with either bootstrapping or coal as the source of energy for new plant construction. For both wind and solar, bootstrapping produces higher temperatures during the first 70–100 yr than would occur if the plants were constructed using power from the existing grid. For transitions lasting longer than 100 yr, bootstrapping does yield lower GHG emissions for plant construction and, eventually, lower temperatures than grid-connected build-outs. On this extended time scale, however, emissions for grid-connected models are likely to fall substantially as well, due to changes in the mix of electricity generation.

Figure 3(A) shows that, for fossil fuel plants, emissions from plant operation are the predominant source of life-cycle emissions, and they are responsible for the majority of the global temperature increase produced. Conservation yields the largest temperature reductions. In transitions to wind, solar, and nuclear technologies, temperature increases caused by emissions during plant construction exceed those due to plant operation; the resulting temperature increases are dwarfed, however, by those caused by emissions from coal plants as they are being phased out.

Temperature increases due to transmission and waste heat are small but can amount to a substantial fraction of the total temperature increase associated with the lowest emission technologies.

5. Sources of uncertainty

Our central result is that transitions from coal to energy technologies having lower carbon emissions will not substantially influence global climate until more than half a century passes, and that even large transitions are likely to produce modest reductions in future temperatures. These fundamental qualitative conclusions are robust, but our quantitative calculations incorporate important sources of uncertainty in representations of both the energy system and the physical climate system.

We characterize uncertainty in energy system properties by presenting both high and low estimates from life-cycle analyses (e.g., figures 1–3). Our model of the physical climate system is affected by uncertainties both in the relationship between greenhouse gas emissions and atmospheric concentrations and in the relationship between atmospheric concentrations and the resulting climate change. The IPCC [5] states that equilibrium climate sensitivity to a doubling of atmospheric CO₂ content ‘is likely to lie between 2 and 4.5 °C with a most likely value of approximately 3 °C.’ Our model yields a climate sensitivity of 3.18 °C per CO₂-doubling. Physical climate system uncertainties could thus potentially halve or double our quantitative results. The impact of most of these uncertainties would apply equally to all technologies, however, so relative amounts of warming resulting from different technology choices are likely to be insensitive to uncertainties about the climate system.

6. Conclusions

Here, we have examined energy system transitions on the scale of the existing electricity sector, which generates ~1 TW_e primarily from approximately 3 TW thermal energy from fossil fuels [3]. It has been estimated, however, that 10–30 TW of carbon-neutral thermal energy must be provisioned by mid-century to meet global demand on a trajectory that stabilizes the climate with continued economic growth [1].

It appears that there is no quick fix; energy system transitions are intrinsically slow [13]. During a transition, energy is used both to create new infrastructure and to satisfy other energy demands, resulting in additional emissions. These emissions have a long legacy due to the long lifetime of CO₂ in the atmosphere and the thermal inertia of the oceans. Despite the lengthy time lags involved, delaying rollouts of low-carbon-emission energy technologies risks even greater environmental harm in the second half of this century and beyond. This underscores the urgency in developing realistic plans for the rapid deployment of the lowest-GHG-emission electricity generation technologies. Technologies that offer only modest reductions in emissions, such as natural gas and—if the highest estimates from the life-cycle analyses (SOM table S1 available at stacks.iop.org/ERL/7/014019/mmedia) are correct—carbon capture storage, cannot yield substantial temperature reductions this century. Achieving substantial reductions in temperatures relative to the coal-based system will take the better part of a century,

and will depend on rapid and massive deployment of some mix of conservation, wind, solar, and nuclear, and possibly carbon capture and storage.

Acknowledgments

The authors are grateful to W Gibbs, L Wood and A Modoran for helpful comments on the manuscript.

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MAGNOLIA LNG PROJECT

Resource Report 1

GENERAL PROJECT DESCRIPTION

Docket No: CP14-____-000
30 April 2014

Submitted by:

MAGNOLIA
LNG

Magnolia LNG, LLC
1001 McKinney, Suite 400
Houston, TX 77002

Prepared by:



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SUMMARY OF FILING INFORMATION	
INFORMATION	SECTION REFERENCE
Minimum Filing Requirements	
<input checked="" type="checkbox"/> 1. Provide a detailed description and location map of the project facilities (§380.12(c)(1)) <ul style="list-style-type: none"> • Include all pipeline and aboveground facilities. • Include support areas for construction or operation. • Identify facilities to be abandoned. 	Section 1.1 Section 1.3 Section 1.8
<input checked="" type="checkbox"/> 2. Describe any non-jurisdictional facilities that would be built in association with the project (§ 380.12(c)(2)) <ul style="list-style-type: none"> • Include auxiliary facilities (See § 2.55(a)). • Describe the relationship to the jurisdictional facilities. • Include ownership, land requirements, gas consumption, megawatt size, construction status, and an update of the latest status of federal, state, and local permits/approvals. • Include the length and diameter of any interconnecting pipeline. • Apply the four-factor test to each facility. (see § 380.12(c)(2)(ii)) 	Section 1.12
<input checked="" type="checkbox"/> 3. Provide current, original United States Geological Survey (USGS) 7.5-minute series topographic maps with mileposts showing the project facilities (§ 380.12(c)(3)) <ul style="list-style-type: none"> • Maps of equivalent details are acceptable if legible (check with staff). • Show locations of all linear project elements, and label them. • Show locations of all significant aboveground facilities, and label them. 	Appendix 1.A
<input checked="" type="checkbox"/> 4. Provide aerial images or photographs or alignment sheets based on these sources with mileposts showing the project facilities. (§ 380.12(c)(3)) <ul style="list-style-type: none"> • No more than 1-year old • Scale no smaller than 1:6,000 	Appendix 1.B

SUMMARY OF FILING INFORMATION	
INFORMATION	SECTION REFERENCE
Minimum Filing Requirements	
<input checked="" type="checkbox"/> 5. Provide plot/site plans of compressor stations showing the location of the nearest noise-sensitive areas (NSA) within 1 mile. (§ 380.12(c)(3,4)) <ul style="list-style-type: none"> • Scale no smaller than 1:3,600 • Show reference to topographic maps and aerial alignments provided above. 	There are no compressor stations included as part of the proposed Magnolia LNG Project; however, one will be required as part of the transportation of feed gas to the Project as explained in Section 1.13.
<input checked="" type="checkbox"/> 6. Describe construction and restoration methods. (§ 380.12(c)(6))	Section 1.5
<input checked="" type="checkbox"/> 7. Identify the permits required for construction across surface waters. (§ 380.12(c)(9)) <ul style="list-style-type: none"> • Include the status of all permits. • For construction in the federal offshore area be sure to include consultation with BOEM. • File with the BOEM for rights-of-way grants at the same time or before you file with the FERC. 	Section 1.10 Appendix 1.E
<input checked="" type="checkbox"/> 8. Provide the names and addresses of all affected landowners as required and certify that all affected landowners would be notified. <ul style="list-style-type: none"> • Affected landowners are defined in § 157.6(d)(2). • Provide an electronic copy directly to the environmental staff. 	Appendix 1.F <i>[Privileged]</i>
Additional Information Often Missing and Resulting in Data Requests	
<input checked="" type="checkbox"/> Describe all authorizations required to complete the proposed action and the status of applications for such authorizations.	Section 1.10 Appendix 1.E
<input checked="" type="checkbox"/> Provide plot/site plans of all other aboveground facilities that are not completely within the right-of-way	Section 1.3, Figures 1.3-1 through 1.3-3
<input type="checkbox"/> Provide detailed typical construction right-of-way cross-section diagrams showing information such as widths and relative locations of existing rights-of-way, new permanent rights-of-way, and temporary construction rights-of-way. See Resource Report 8 – Land Use, Recreation, and Aesthetics.	Not applicable
<input checked="" type="checkbox"/> Summarize the total acreage of land affected by construction and operation of the project.	Section 1.3

SUMMARY OF FILING INFORMATION	
INFORMATION	SECTION REFERENCE
Minimum Filing Requirements	
<input checked="" type="checkbox"/> If Resource Report 5 - Socioeconomics is not provided, provide the start and end dates of construction, the number of pipeline spreads that would be used, and the workforce per spread.	RR 5 is included in this filing; <i>also see</i> Section 1.5 and Appendix 1.D
<input checked="" type="checkbox"/> Send two (2) additional copies of topographic maps and aerial images/photographs directly to the environmental staff of the Office of Energy Projects	Included with this submittal

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APPENDICES

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Appendix 1.C: Real Estate Lease Option Agreements

1.C.1 Port District Option Agreement

1.C.2 BG LNG Option Agreement

1.C.3 Amendment to the Port District Option Agreement

Appendix 1.D: Project Schedule

Appendix 1.E: Permits and Approvals for the Project

Appendix 1.F: List of Landowners for the Project *[PRIVILEGED]*

Appendix 1.G: Federal, State, Local, Business, and Other Stakeholders

ACRONYMS AND ABBREVIATIONS

9% Ni	9-percent nickel
°C	degrees Celsius
°F	degrees Fahrenheit
AEO	Annual Energy Outlook
ANR	ANR Pipeline Company
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
Bcf	billion cubic feet
BMP	best management practice
BOG	boil-off gas
Bscf/d	billion standard cubic feet per day
BTEX	benzene, toluene, ethylbenzene and xylenes
Btu/ft ² -hr	British thermal units per square foot per hour
CCTV	closed circuit television
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulations
CGT	Columbia Gulf Transmission
CHP	combined heat and power
CIK	core in kettle
CO ₂	carbon dioxide
DII	Dynamic Industries, Inc.
DOE	(United States) Department of Energy
Dth/d	dekatherms per day
ECA	Emissions Control Area
EIA	Energy Information Administration
EPC	engineering, procurement, and construction
ERC	emergency release coupler
ESD	emergency shutdown
KMLP's Eunice C/S	Kinder Morgan Louisiana Pipeline's new compressor station to be located near Eunice, Louisiana

FEED	Front-End Engineering Design
FERC	Federal Energy Regulatory Commission or Commission
FTA	Free Trade Agreement
GE	General Electric
GTL	gas-to-liquid
H ₂ O	water
HP	high pressure
HV	high voltage
IMO	International Maritime Organization
KMLP	Kinder Morgan Louisiana Pipeline
kV	kilovolt(s)
LA	Louisiana
LAC	Louisiana Administrative Code
LCZ	Louisiana Coastal Zone
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LDWF	Louisiana Department of Wildlife and Fisheries
LED	Louisiana Economic Development
LLC	Limited Liability Corporation
LNG	liquefied natural gas
LP	low pressure
LPDES	Louisiana Pollutant Discharge Elimination System
m ³	cubic meters
m ³ /hr	cubic meters per hour
Magnolia	Magnolia LNG, LLC
MARPOL 73/78	International Maritime Organization (IMO) Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978
MLG	mean low gulf
MR	mixed refrigerant
MSU	Marine Safety Unit

mtpa	million (metric) tonnes per annum
MW	megawatt(s)
N ₂	nitrogen
NAVD88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NGA	Natural Gas Act
NPDES	National Pollutant Discharge Elimination System
O&M	operation and maintenance
OEP	Operations Execution Plan
OSMR [®]	Optimized Single Mixed Refrigerant
OSV	offshore supply vessel
OTSG	once-through steam generator
OWI	oily water interceptor
PF	Pre-Filing
PHMSA	Pipeline and Hazardous Materials Safety Administration
Plan	Project-specific Upland Erosion Control, Revegetation, and Maintenance Plan
Port District	Lake Charles Harbor & Terminal District
ppm	parts per million
Procedures	Project-specific Wetland and Waterbody Construction and Mitigation Procedures
psia	pounds per square inch (absolute)
psig	pounds per square inch (gauge)
ROW	right-of-way
RR	Resource Report
SHPO	State Historic Preservation Officer
SMR	single mixed refrigerant
SPMT	self-propelled modular transporter
SWPPP	stormwater pollution prevention plan
Tcf	trillion cubic feet

TGT	Texas Gas Transmission
TMDL	total maximum daily load
Trunkline LNG project	Trunkline LNG, LLC, Lake Charles Export Terminal
U.S.	United States
UPS	uninterruptible power supply; <i>also</i> United Parcel Service
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USDOT	(United States) Department of Transportation
USEPA	United States Environmental Protection Agency
VHF	very high frequency
WQC	Water Quality Certification
WSA	Waterway Suitability Assessment

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1 GENERAL PROJECT DESCRIPTION

Magnolia LNG, LLC (Magnolia) has prepared this Resource Report (RR) 1 in compliance with the requirements of the Federal Energy Regulatory Commission (FERC or the Commission) regulations for authorization under Section 3(a) of the Natural Gas Act (NGA) to site, construct and operate facilities necessary to liquefy natural gas at a proposed site in Lake Charles, Louisiana. On March 12, 2013, Magnolia requested approval to participate in the FERC Pre-Filing Process to assist in the identification and proper assessment of issues and to provide input into the development of the environmental resource reports. The FERC granted this request on March 20, 2013, and assigned Pre-Filing (PF) Docket Number PF13-9-000.

This RR 1 provides a description of the proposed Magnolia LNG Project (referred to herein as the Project) and its purpose and need, both from a regional and a national perspective, as well as a specific description of the Project facilities and certain non-jurisdictional facilities. The proposed construction schedule, land requirements, operation, maintenance, and safety procedures for the Project are also addressed in this RR.

Additionally, this RR 1 provides a discussion about cumulative impacts. Cumulative impacts are the collective result of the incremental impacts of an action that, when added to the impacts of other past, present, and reasonably foreseeable future actions, would affect the same resources, regardless of what agency or person undertakes those actions (40 Code of Federal Regulations [CFR] 1508.7). These include (but are not limited to) actions under analysis by a regulatory agency, proposals being considered by state or local planners, plans that have begun implementation, or future actions that have been funded.

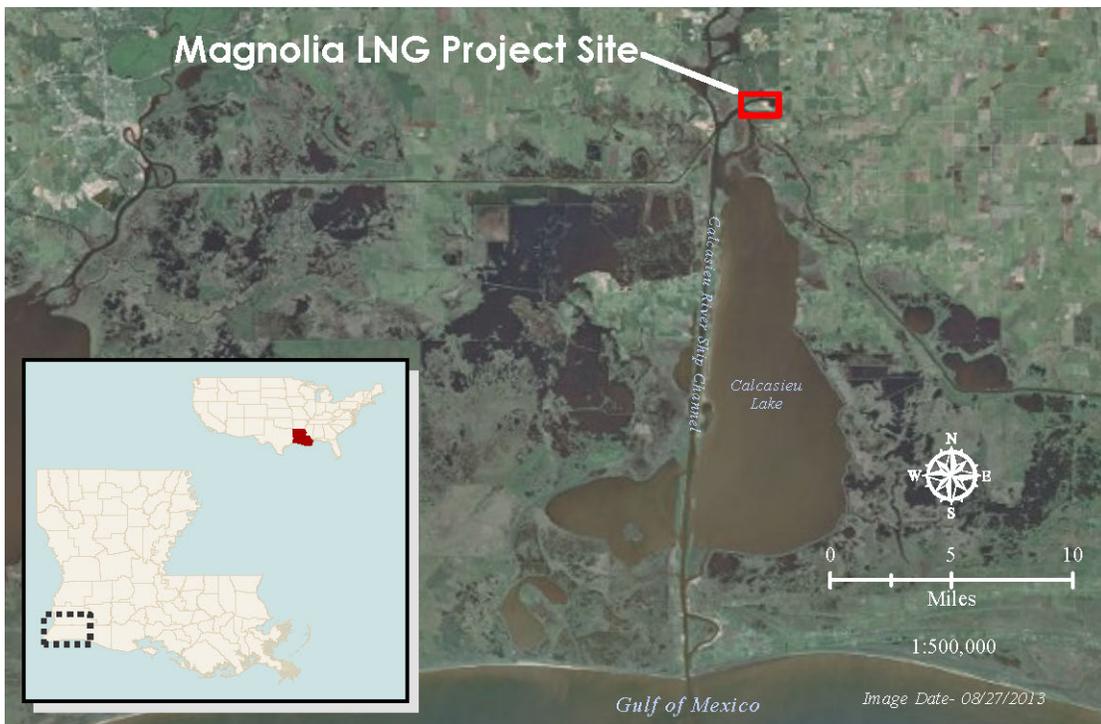
Lastly, RR 1 provides an update of the applicable regulatory approvals and coordination with the respective federal, state, and local agencies.

1.1 PROPOSED FACILITIES

Magnolia is proposing to develop a liquefied natural gas (LNG) facility capable of producing a nominal capacity of approximately 8.0 million (metric) tonnes per annum (mtpa) of LNG using its highly efficient and patented Optimized Single Mixed Refrigerant (OSMR[®]) technology. The Project would receive natural gas via a tie-in to an existing interstate pipeline that traverses the proposed Project site. The natural gas would be treated, liquefied, and stored on-site in two full containment LNG storage tanks with a net pumpable capacity of approximately 160,000 cubic meters (m³) of LNG each. At full plant capacity, the Project would consist of four LNG trains each with a nominal capacity of 2.0 mtpa of LNG (total nominal capacity of approximately 8.0 mtpa). The LNG would be loaded onto LNG carriers for export overseas; LNG carriers and barges for domestic marine distribution and the possibility of LNG bunkering; and LNG trucks for road distribution to LNG refueling stations in Louisiana and the

surrounding states. The Project site is well-positioned to provide access for loading of LNG carriers and also for potential LNG barges and LNG trucks.¹

The Project would be located on the south shore of the Industrial Canal on the Port of Lake Charles Tract 475, an approximately 115-acre parcel of land in Calcasieu Parish, south of Lake Charles, Louisiana. The Industrial Canal is located off the main Calcasieu River Ship Channel. The Project would be located in an area zoned for heavy industrial use and would be consistent with other industrial facilities along the shoreline. The coordinates of the proposed Project site are as follows: Latitude: 30° 06' 20.30" N; Longitude: 93° 17'54.00" W. Figure 1.1-1 is a general location map of the Project (also see Appendices 1.A and 1.B).



¹ LNG highway transportation refueling stations generally receive their LNG supply from a liquefaction plant via LNG trucks specially designed to distribute cryogenic fuels. At the refueling site, LNG is offloaded into the facility's storage system. To support long-haul, heavy-duty trucks moving goods throughout the United States, LNG truck fueling stations along major interstate corridors are required.

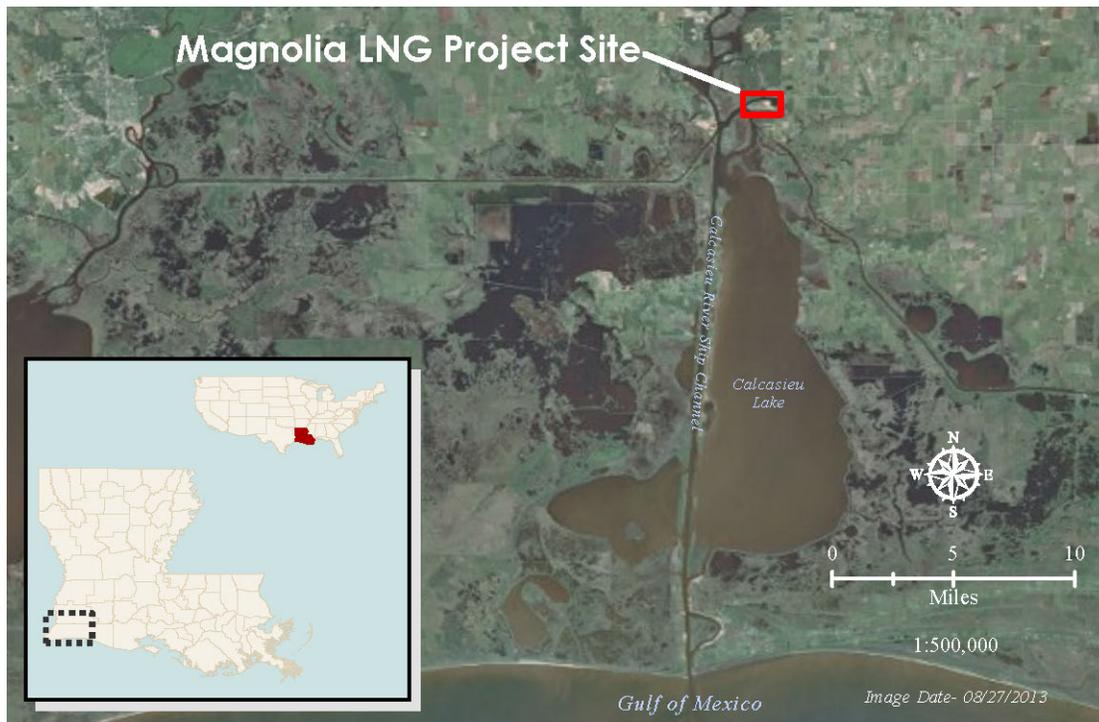


Figure 1.1-1 General Location Map of the Magnolia LNG Project

On March 6, 2013, Magnolia signed an exclusive and binding four-year Real Estate Lease Option Agreement with the Lake Charles Harbor & Terminal District (Port District) for approximately 107.59 acres of the approximately 115-acre Project site (see Port District Option Agreement, in Appendix 1.C.1). The Port District Option Agreement includes a clause for a 30-year-term ground lease option with the right to extend the lease term for four periods of 10 years each for a total of 70 years. Subject to compliance with the terms of the Port District Option Agreement, Magnolia may exercise the option and enter into the ground lease with the Port District at any time.

On September 26, 2013, Magnolia signed an exclusive and binding four-year Real Estate Lease Option Agreement with BG LNG Services, LLC, for approximately 5.74 acres of the approximately 115-acre Project site (see Appendix 1.C.2). On October 21, 2013, Magnolia signed the First Amendment to the Port District Option Agreement (see Appendix 1.C.3) for an additional area of approximately 1.99 acres. These two agreements are on similar terms and conditions as the initial Port District Option Agreement.

Through the combination of the Port District Option Agreement, the BG LNG Option Agreement, and the First Amendment to the Port District Option Agreement, Magnolia will have control of the entire area comprising the approximately 115-acre Project site for at least the minimum expected operational life of the Project, which is 30 years, with the right to extend the lease term. Figure 1.1-2 shows the boundary of the total leased area.



Figure 1.1-2 Project Site Boundary Map

Figure 1.1-3 is a more detailed map of the proposed Magnolia LNG Project site and the waterway system along the Calcasieu River Ship Channel, in the vicinity of Choupique Island, and the Intracoastal Waterway area to the Devil's Elbow section of the Calcasieu River. The figure also shows the locations of Trunkline LNG, Cameron LNG, and the proposed G2X Energy plant relative to the Project site. Additionally, the Calcasieu Point Landing public boat ramp and facilities (see inset on Figure 1.1-3) are located west of the Project site at the end of Henry Pugh Boulevard (3955 Henry Pugh Boulevard, Lake Charles, Louisiana). Park amenities include: (1) a three-lane public boat ramp that allows access to the Industrial Canal and Gulf Intracoastal Waterway, (2) a fishing pier on the Industrial Canal, (3) a full-service store within the park offering snacks and beverages, and (4) public restrooms.

The proposed Louisiana Marine Fisheries Enhancement, Research, and Science Center is planned immediately southeast of the Project site (see Figure 1.1-4). The main function of this center will be for the research and enhancement of marine fisheries and for the long-term monitoring of the fishery resource. This facility will include a laboratory, a library, a visitor complex to provide education on fisheries and restoration programs, and a recreational fishing pond. A meeting complex/dormitory for staff and visiting researchers also is planned. The hatchery facility will be focused on the production of spotted seatrout, red drum, and southern flounder. There will be three 0.5-acre ponds for propagation and research, a water reservoir with

pipeline and water intake station, and an effluent pump station² (see Figure 1.1-4). Refer to Section 1.9, “Cumulative Impacts,” for an illustration of other existing and proposed facilities in the Project vicinity.

² Email from Duet, J., Biologist Director, Louisiana Department of Wildlife and Fisheries, Fisheries Extension, to W. Daughdrill, Ecology and Environment, Inc. (July 24, 2013).

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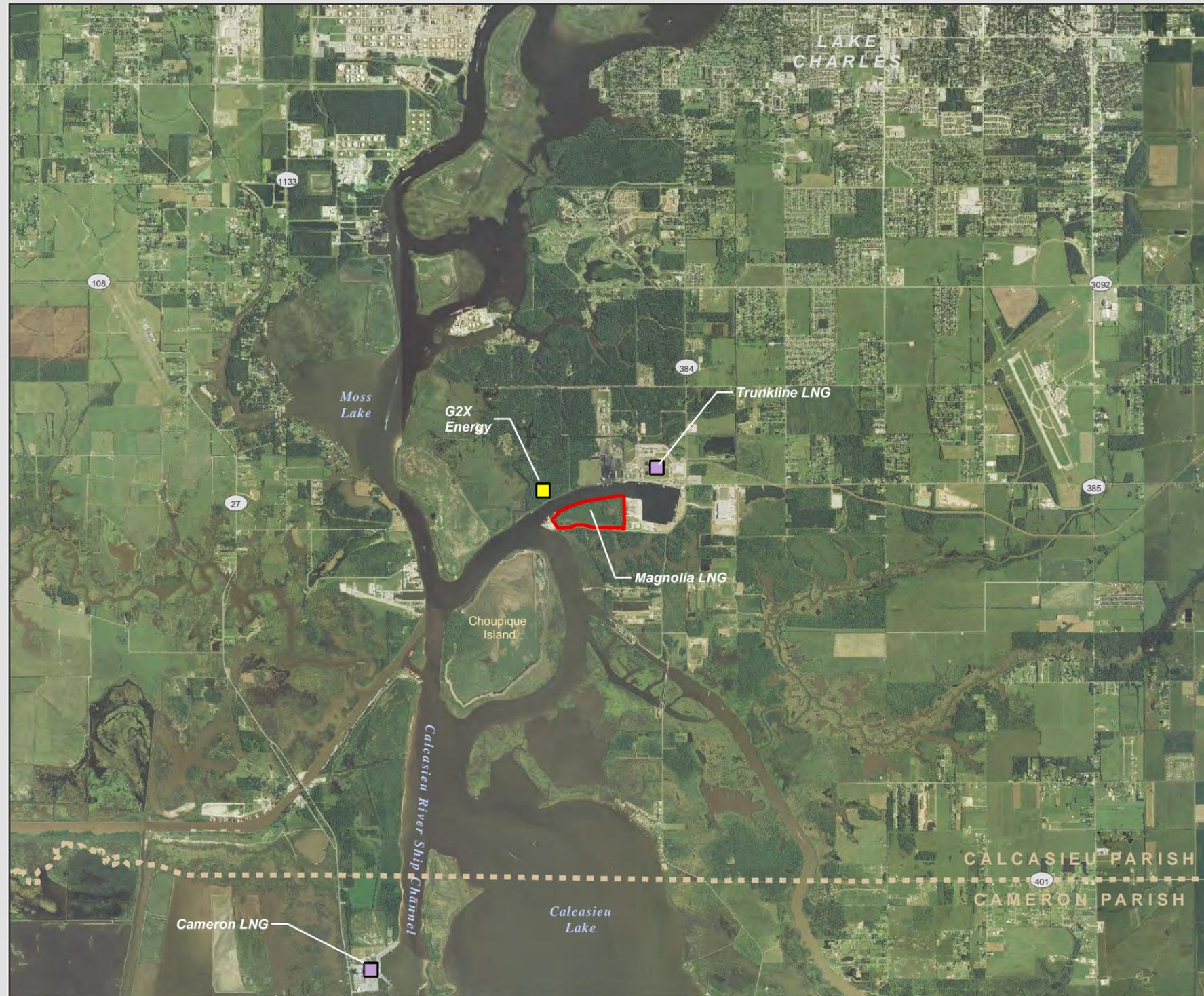
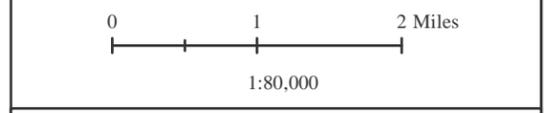


Figure 1.1-3
Waterway System in the Vicinity of
Choupique Island and Along the
Calcasieu River Ship Channel Facilities
 Magnolia LNG
 Calcasieu Parish, Louisiana

Legend

- Proposed LNG Facility Boundary
- Parish Boundary
- Existing LNG with Proposed Expansion
- Major Highway
- G2X Energy



Source- ESRI 2011-2012
 Image Date- 08/27/2013
 Date: 4/28/2014

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For the purposes of this RR 1, the FERC jurisdictional facilities for the Magnolia LNG Project site can be broken down into the following Project facilities:

- Gas Gate Station and Interconnect Pipeline
- LNG Trains
- LNG Storage
- LNG Vessel Loading
- LNG Truck Loading
- Flare Stacks
- Demineralized Water Treatment Plant
- Facility Drainage and Containment
- Control, Administration, and Workshop Buildings
- Power, Water, and Communications (Note that power and water also include off-site non-jurisdictional facilities leading to the Project site.)

RR 13, “Engineering and Design Material,” contains additional information on each Project component.

1.1.1 Gas Gate Station and Kinder Morgan Louisiana Pipeline Interconnect Pipeline

Feed gas would be transported to the site boundary via an existing 42-inch interstate gas pipeline owned and operated by Kinder Morgan Louisiana Pipeline (KMLP) that passes beneath the Project site near the southern boundary. The KMLP pipeline would be accessed within the Project site boundary. A short interconnect pipeline of approximately 75 feet to be located entirely within the Project site would tie-in the existing underground pipeline to the Gas Gate Station. The Gas Gate Station would include an incoming interconnect pipeline, a filter/separator, custody transfer meter(s), a pressure regulator, an emergency shutdown (ESD) valve, and a gas analyzer. The short interconnect pipeline, the Gas Gate Station, the modification of certain existing KMLP delivery meter facilities to make them bidirectional, and the installation of new compression facilities near Eunice, Louisiana, will be built, owned, and operated by KMLP and, as such, will require a separate filing by KMLP with the FERC under Section 7(c) of the NGA as explained in Section 1.13, “Transportation of Feed Gas to the Magnolia LNG Project.” A binding precedent agreement related to these facilities and up to 1.4 billion standard cubic feet per day (Bscf/d) of firm transportation on KMLP’s pipeline was executed on January 28, 2014, between KMLP and Magnolia.

1.1.2 LNG Trains

At full plant capacity, the Project would consist of four LNG trains each with a nominal capacity of 2.0 mtpa of LNG (totaling approximately 8.0 mtpa nominal capacity). At full plant capacity, approximately 1.4 Bscf/d of natural gas would be contracted for transportation to the Project site via the interstate pipeline to support Project operations. Each LNG train has a guaranteed capacity of 1.7 mtpa of LNG and a nominal capacity of 2.0 mtpa of LNG. The core of each LNG train would be a single mixed refrigerant (SMR) process. This simple SMR process is then optimized by the use of three proven technologies: aero-derivative gas turbines,

combined heat and power (CHP) technology, and ammonia auxiliary refrigeration. The integration of these proven technologies to enhance the SMR process resulted in the patented OSMR[®] process technology.

Each OSMR[®] LNG train would include the following essential facilities: an amine gas-sweetening unit (carbon dioxide [CO₂] and hydrogen sulfide removal), a dehydration and mercury removal system, a heavy hydrocarbon removal system, a fuel gas system, two mixed refrigerant (MR) circuits (each circuit comprised of an aero-derivative gas turbine, MR compressor, cold box, MR coolers, and suction scrubber), a CHP plant (comprised of a once-through-steam-generator [OTSG] located on the gas turbine exhaust, an auxiliary boiler, steam turbines, air-cooled condensers, and demineralized water treatment plant), an ammonia refrigeration plant, and plant utilities. These technologies are discussed in greater detail in Section 1.4, “Process Description.”

Each of the LNG trains’ essential facilities would include the following components:

- Gas Sweetening Unit (CO₂ and hydrogen sulfide removal)
 - amine contactor column
 - amine reboiler and regenerator
 - amine charge pump, amine reflux pump, and booster pump
 - amine reflux condenser and reflux accumulator
 - amine economizer and lean/rich amine exchanger
 - wet gas cooler
 - thermal oxidizer (for BTEX removal)
- Dehydration Unit (water [H₂O] removal):
 - molecular sieve vessels (three per LNG train)
 - regeneration gas cooler
 - regeneration gas scrubber
 - regeneration gas heater
- Dust Filter
- Mercury Guard Bed
- Fuel Gas System:
 - high pressure (HP) fuel gas knock-out drum
 - low pressure (LP) fuel gas knock-out drum
 - HP fuel gas heater
 - LP fuel gas heater
- Two MR Circuits. Each MR circuit would contain:
 - cold box (brazed aluminum heat exchanger)
 - MR pre-cooler (core in kettle [CIK] exchanger)
 - MR compressor

- gas turbine
- inlet air chiller
- MR suction scrubber
- MR cooler
- heavy hydrocarbon removal system

- Ammonia Refrigeration Plant:
 - steam turbine-driven ammonia compressors (two per LNG train)
 - ammonia suction scrubber (two per LNG train)
 - ammonia condensers
 - ammonia liquid receiver
 - HP ammonia receiver

- CHP Plant:
 - OTSG connected to each gas turbine exhaust
 - two condensing steam turbines, each driving an ammonia compressor
 - steam desuperheater (two per LNG train)
 - air-cooled condensers (two per LNG train)
 - deareator
 - condensate drums and condensate pumps for the ammonia compressor drives
 - boiler feed water pumps (two per LNG train)
 - auxiliary boiler

- Plant Utilities:
 - instrument air package
 - instrument air receiver
 - nitrogen (N₂) package
 - N₂ receiver
 - fresh water tank and pumps
 - demineralized water treatment plant
 - demineralized water storage tank
 - demineralized water pumps
 - treated water storage tanks
 - treated water pumps
 - chemical injection system
 - analyzers

- Fire and Gas Detection and Protection System (see Section 1.7, “Safety”)

For information regarding atmospheric emissions of hydrogen sulfide and CO₂ from the amine gas-sweetening unit and heavy hydrocarbons from the heavy hydrocarbon removal system, please refer to RR 9, “Air Quality and Noise,” Section 9.2.6.1 “Emission Estimates.” Permitting of atmospheric emissions is delegated to the Louisiana Department of Environmental Quality (LDEQ) through the federal Title V operating permit program.

Regarding the volumes of mercury generated from the mercury removal unit, it is anticipated that, on average, less than 2 kilograms per train would be generated every 15 years. The mercury generated would be removed from the Magnolia LNG facility by a third-party licensed contractor and disposed off-site at a licensed hazardous waste facility. To remove the mercury, non-regenerative mercury guard beds would be used (please refer to RR 13, “Engineering and Design Material,” Section 13.1.6.1). Approximately 26,000 pounds of adsorbent material per train would be used and replenished every 15 years. A specialized third-party contractor approved by the adsorbent vendor would be used for loading and unloading services. Mercury to be generated by Magnolia LNG would meet the United States Environmental Protection Agency (USEPA) waste Code U151, CAS 7439-97-6 specifications, and the Magnolia LNG facility would be a conditionally exempt small quantity generator as defined in the Louisiana Administrative Code, Title 33 Part V (LAC 33:V), Chapter 1 (§108. Special Requirements for Hazardous Waste Generated by Conditionally Exempt Small Quantity Generators, page 19).

1.1.3 LNG Storage

Two full containment LNG storage tanks each with a net pumpable capacity of approximately 160,000 m³ would store the LNG product from LNG trains 1 through 4. The LNG storage tanks would be full-containment type, consisting of double-wall construction, with an inner wall being of low-temperature 9-percent nickel (9% Ni) steel and the outer wall of reinforced post-tensioned concrete. The LNG storage tanks would be designed to meet the requirements of National Fire Protection Association (NFPA) Standard 59A, regulations of the United States Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) at 49 CFR Part 193, and other applicable standards.

Each LNG storage tank would have the following features:

- inner wall (primary containment): 9% Ni steel
- outer wall (secondary containment): Reinforced post-tensioned concrete with a steel liner
- reinforced concrete domed roof, supporting insulated deck, LNG pumps and tank top LNG and vapor pipework
- an insulated aluminum deck over the inner containment suspended from the outer containment roof
- submerged motor pumps located in vertical pump caissons and supported by a structure attached to the roof and walls
- base heating system
- pressure, level and temperature instrumentation, including monitoring of tank cool-down
- pressure and vacuum relief systems
- nozzles and internal pipework including two-phase inlet, top cool-down spray
- all nozzle penetrations through the roof
- N₂ purge and gas detection system for wall and floor insulation space
- roof platforms, walkways, and pipe supports

- external stairways, ladder, and pipe supports

The LNG storage tanks are designed and would be constructed so that the self-supporting 9 percent Ni steel primary containment and the concrete secondary containment would be capable of independently containing the LNG. The 9 percent Ni steel primary containment would contain the LNG under normal operating conditions. The concrete secondary containment is designed to be capable of containing 110 percent of the capacity of the inner tank. Furthermore, an earthen berm would be constructed around both of the LNG storage tanks and would have a minimum containment capacity equal to the gross volume of one LNG tank, which is 167,600 m³. A proposed site plan showing the location of the proposed LNG storage tanks in relation to other Project facilities is shown on Figure 1.1-5.

1.1.4 LNG Vessel Loading

To accommodate LNG vessels and to minimize interference with existing canal traffic, the LNG vessel loading facility is planned to be recessed into the northern boundary of the site (see Figure 1.1-6). The following components are included as part of the LNG vessel loading facility.

- A single LNG vessel loading facility complete with:
 - LNG cryogenic loading line of nominal 30-inch size (outside diameter of 32 inches; pipe schedule 10S, with a wall thickness of 0.31 inches) from the LNG storage tank
 - three 16-inch LNG loading arms
 - one 16-inch vapor return arm
 - one 8-inch loading arm with piggy back 6-inch vapor return line for LNG barges
 - electro-hydraulic control system
- Each arm is equipped with:
 - a hydraulic quick connect/disconnect coupler
 - a hydraulic double ball valve emergency release coupler
 - swivel joints with N₂ purge;
 - mechanical locking device for arm stowing
 - N₂ purge and drain connections
 - Breasting dolphins and mooring dolphins
 - Standby tug and security/support vessels mooring area

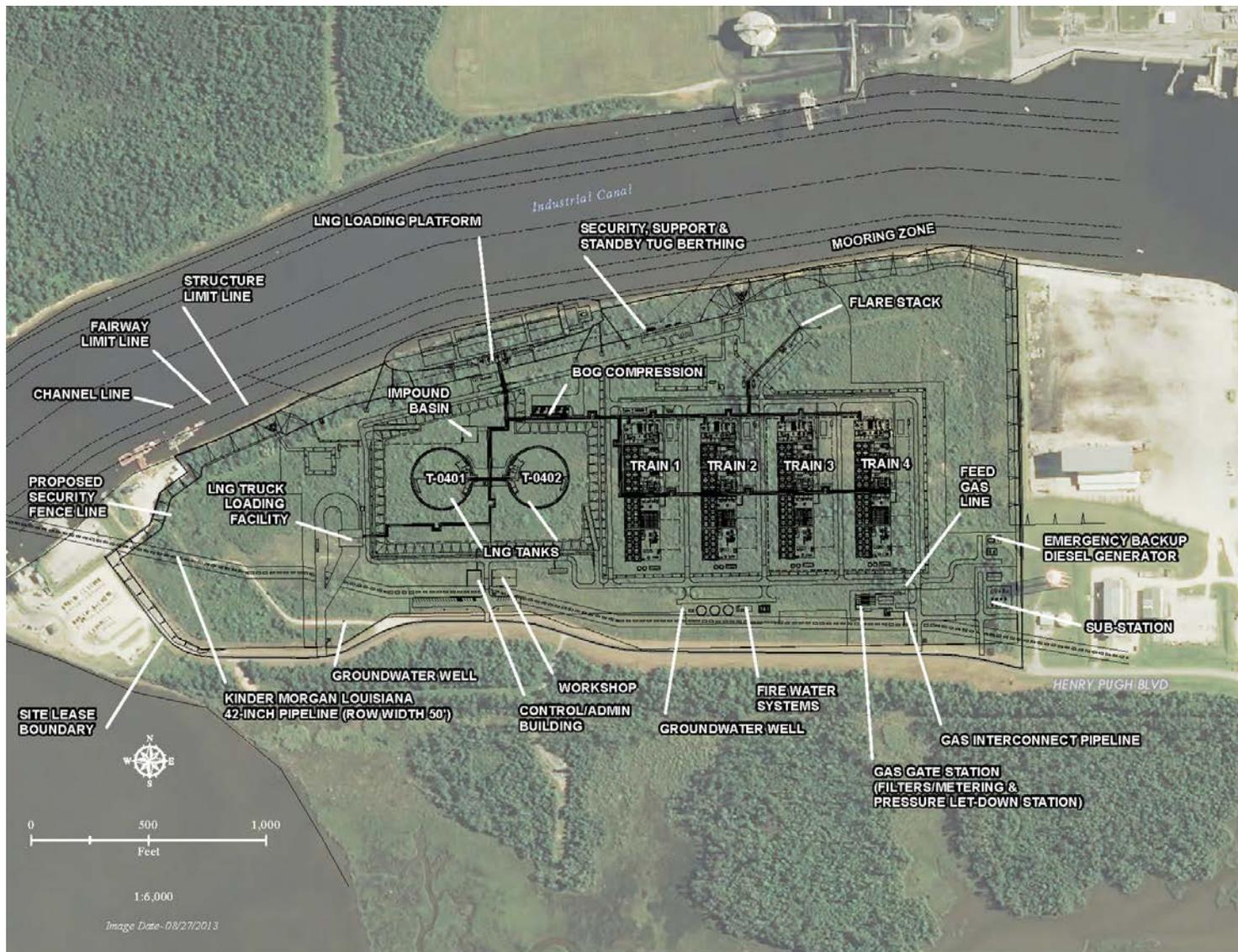


Figure 1.1-5 Proposed Site Plan

The berth size, location, and orientation is designed to optimize a number of criteria, primarily to ensure safe navigable approach and departure conditions, a safe mooring environment, proximity to the channel, and safe distance from the influence of passing vessels. Other influences include water depth and optimization of the cryogenic piping arrangement. To achieve the maximum 10,000 cubic meters per hour (m³/hr) loading rate for LNG vessels, the main cryogenic LNG line from the LNG storage tanks to the loading platform would be nominally sized at 30 inches. The LNG loading platform would support three 16-inch LNG loading arms, and one 16-inch vapor return arm for loading the LNG carriers, and one 8-inch LNG loading arm with a piggyback mounted 6-inch vapor return arm for loading LNG barges.

The total volume of material to be excavated and dredged (from a 16.20-acre proposed LNG basin area) to construct the recessed berthing area and waterway access is approximately 993,750 cubic yards. The final calculated dredging volume and the dredging plan will be developed in accordance with the relevant guidelines and in coordination with the Port of Lake Charles and in compliance with the requirements of the United States Army Corps of Engineers (USACE).

According to the Lake Charles Pilots Association,³ approximately 1,000 vessels call on the Port of Lake Charles annually (as of 2012), equating to 1,000 inbound transits, 1,000 outbound transits, and numerous intra-port vessel shifts. The Project is being designed with new berthing and mooring configurations to accommodate LNG carriers and LNG barges. Current layout for the Project provides an additional breasting dolphin to cover the smaller capacity LNG vessels and barges; this breasting dolphin would be located in front of the LNG loading platform to ensure contact on the flat panel of the smaller vessels when spotted across from the dedicated combination LNG liquid arm and vapor line. Magnolia intends to use a dedicated all-metal articulated LNG liquid arm with a vapor return line mounted piggyback on the liquid arm for this service. Both the LNG arm and vapor line would be equipped with a double-ball valve-powered emergency release system to provide near dry break disconnection of the arm and vapor line from the LNG barge in the event of over travel or another emergency. Other operating and control equipment would be the same as that installed on the 16-inch-diameter LNG arms for the larger capacity LNG carriers. Please refer to RR 13, "Engineering and Design Materials," for detailed marine design drawings and information. The marine facilities basis of design is contained in RR13 in Appendix C.5 and the marine design drawings are contained in Appendix K (Critical Energy Infrastructure Information [CEII]) of that resource report.

³ In person communication, Captain Brett Palmer, Vice President, Lake Charles Pilots (Jan. 23, 2013).

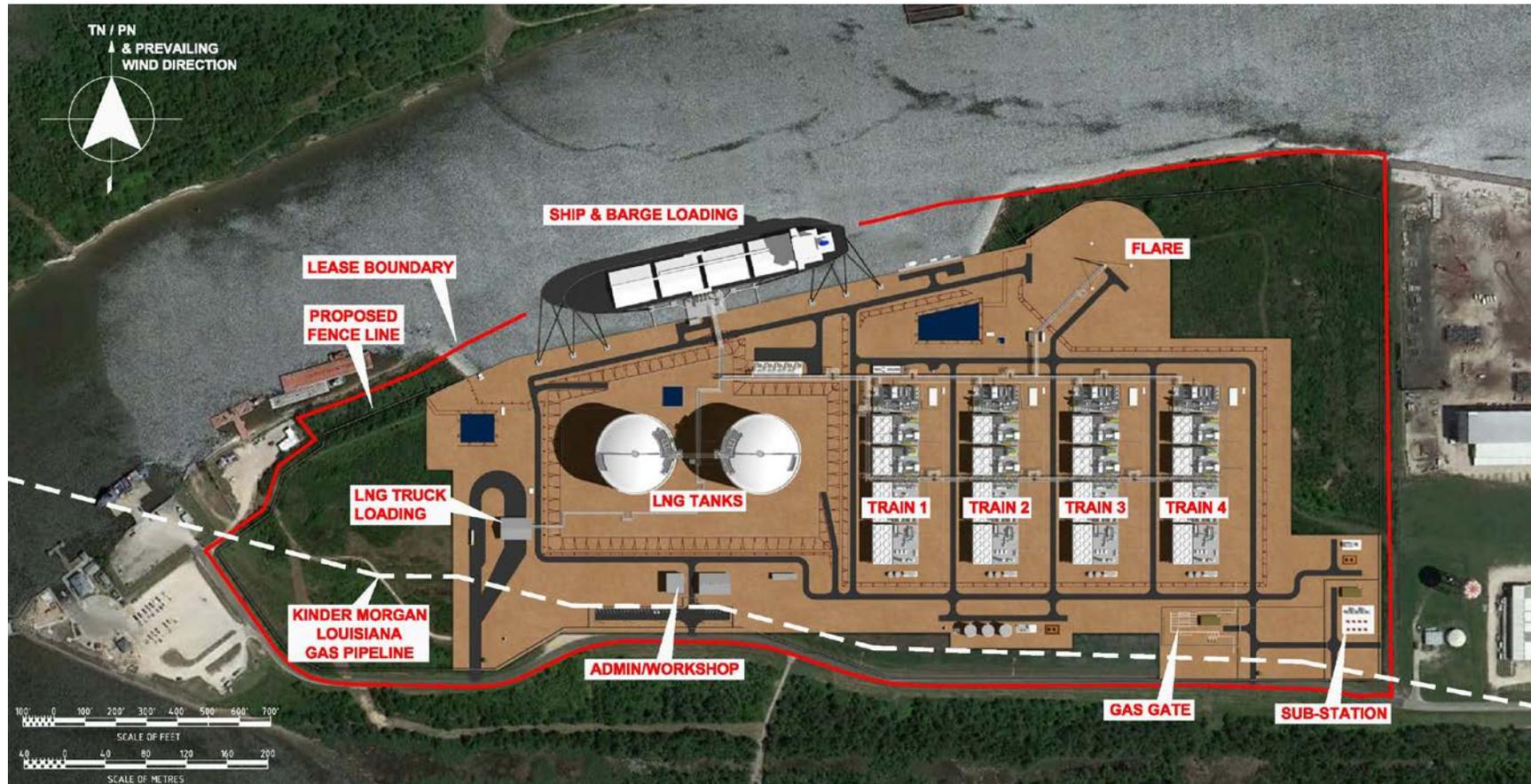


Figure 1.1-6 Artist's Rendering of Proposed Facility Layout

Initially, the Project is expected to utilize LNG carrier capacities of up to 180,000 m³; however, berthing and mooring configurations would be able to accommodate LNG carriers with capacities between 125,000 and 218,000 m³ (LNG-Flex), as well as the LNG barges with capacities of approximately 15,000 m³. It is currently projected that, on average, one to two LNG carriers per week and an additional one to two LNG barges per week would make port calls at the Project terminal when operating at full plant capacity. Current projections of port call frequency are based on the maximum nominal LNG output of 8 mtpa and typical carrier and barge sizes. The actual number of port calls per week will be determined by contracts that are subsequently executed and the capacity of the specific LNG carriers and LNG barges used.

The maximum number of LNG carrier and LNG barge transits per year will be determined by the United States Coast Guard (USCG) as part of the Waterway Suitability Assessment (WSA) process. At this time, Magnolia projects that LNG barge port calls would not begin until after Train 2 is commissioned. This projected number of port calls is based on potential LNG output alone at full plant capacity and does not reflect specific knowledge of anticipated customer requirements.

1.1.5 LNG Vessel Routes

LNG carriers calling at the Magnolia LNG terminal would transit into the Gulf of Mexico via the Straits of Florida (between the Florida Keys and Cuba) or the Yucatan Channel (between the western end of Cuba and Mexico). Figure 1.1-7 depicts potential routes of LNG carriers transiting to or from the Magnolia LNG terminal from the U.S. Outer Continental Shelf (OCS). These vessels would likely transit the OCS as shown on Figure 1.1-7 en route to the southern terminus of the Sabine Pass Safety Fairway (see 33 CFR 166.200(d)(12)). Safety fairways are designated by the USCG to control the erection of structures to provide safe approaches through oil fields in the Gulf of Mexico to entrances to the major ports along the Gulf Coast. Within these safety fairways, no artificial islands or fixed structures (such as oil or natural gas platforms or wells) are permitted to be erected, minimizing the risk of accidents and pollution from ship collision or platform allision.

After transiting north-northwest within the Sabine Pass Safety Fairway, inbound LNG carriers would enter the southern entrance to the Calcasieu Pass Safety Fairway (see 33 CFR 166.200(d)(15)). Inbound LNG carriers would continue north within the limits of the Calcasieu Pass Safety Fairway to the entrance of the Calcasieu Ship Channel located approximately 26 nautical miles offshore from Calcasieu Pass in the Gulf of Mexico. Magnolia's tolling parties and shipping off-takers would likely utilize these designated safety fairways both inbound and outbound from the Magnolia LNG terminal. *U.S. Coast Pilot*, Volume 5, Chapter 9, recommends that ships approach Calcasieu Pass through the prescribed safety fairways (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, and National Ocean Service 2014).

In the northern portion of the Calcasieu Pass Safety Fairway, inbound LNG carriers would embark a Lake Charles Pilot and enter the Calcasieu Ship Channel at buoy CC (29° 20' 01" N, 93° 13' 18" W). From this point, deep-draft LNG carriers are confined to the Calcasieu Ship Channel because of surrounding shallow water depths. Inbound ships would proceed into

the entrance of the Calcasieu Jetties (29° 44.7' N, 93° 20.5 W) and continue northbound in the Calcasieu River Ship Channel to the channel's intersection with the Gulf Intracoastal Waterway at "Devil's Elbow" (30° 05.5' N., 93° 19.5 W.) At this intersection, inbound LNG carriers would make a turn to the northeast and proceed into the Industrial Canal where the ships would moor at the Magnolia LNG terminal. The entire inbound route is depicted on Figure 1.1-7. Inbound LNG carriers would be either empty, partially loaded, or in heel (a small amount of residual LNG on board to maintain cryogenic temperatures within the cargo tanks).

Loaded LNG carriers would transit outbound along the reverse route described for inbound ships. LNG carriers serving the Magnolia LNG terminal are anticipated to arrive from numerous worldwide locations and, similarly, will serve natural gas markets in Europe, Asia, South America, and the Caribbean. It should be noted that Magnolia would not own or charter the LNG carriers calling at the terminal and would not control the inbound or outbound routing of these vessels. Vessel routes in offshore waters may vary from that described above due to owner/charterer routing instructions or voyage-specific safety considerations. LNG barges with a capacity up to 15,000 m³ would also transit inbound and outbound from the Magnolia LNG terminal using these same channels and safety fairways. These well-established routes are described in *U.S. Coast Pilot 5*, Chapter 9, including recommended routes between U.S. Gulf Coast ports (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, and National Ocean Service 2014).

1.1.6 LNG Vessel and Facility Security

LNG vessels transiting the Calcasieu River and Ship Channel are typically designated to have a moving security zone during transit per USCG regulations at 33 CFR 165.805(a)(2). While in transit, LNG vessels are accompanied by a moving security zone that extends 2 miles ahead, 1 mile astern, and from shoreline to shoreline on the Calcasieu River (and from channel edge to channel edge in the offshore waters of the Calcasieu Ship Channel). As a safety and security precaution, no vessels are allowed to meet, cross, or overtake LNG ships in transit or otherwise enter the security zone without the express permission of the USCG. At its discretion, the USCG may elect to provide escort boats during LNG carrier transits to enforce the moving security zone.

Magnolia plans to request that the USCG establish a fixed security zone immediately surrounding the Magnolia LNG terminal. The security zone would serve to keep unauthorized vessels from approaching close to the Magnolia LNG terminal or to LNG carriers moored at the facility. The security zone would serve a similar function to the existing security zones established at 33 CFR 165.805(a)(1) for the nearby Trunkline LNG, LLC and Cameron LNG, LLC, terminals. The size and orientation of this security zone would be coordinated with the USCG to ensure that it would not interfere with passing vessel traffic within the Industrial Canal. Additional discussion of the Magnolia LNG security zone and the moving security zone typically established around LNG carriers transiting the Calcasieu River and Ship Channel is provided in RR 8.

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Magnolia has coordinated with the USCG Captain of the Port, Port Arthur and Marine Safety Unit (MSU) Lake Charles, Louisiana, to prepare and submit the required Follow-On to the preliminary WSA for the Project. The USCG participated in the port stakeholder waterway risk assessment workshop held July 8 to 10, 2013, as part of the Follow-On WSA process. Among other things, the USCG will evaluate the suitability of the proposed vessel route for the expected size and number of LNG carrier and LNG barge transits. Waterway safety and security considerations are included in the USCG's evaluation. The Follow-On WSA, dated November 25, 2013, was submitted to the USCG on December 6, 2013. This document is currently under review. Magnolia will continue to work with the USCG on issues related to the Follow-On WSA and related port safety and security matters.

1.1.7 LNG Truck Loading

The Project would include facilities that allow a portion of the LNG to be loaded onto trucks for road distribution to LNG refueling stations in Louisiana and surrounding states. The LNG truck-loading area would include the following main facilities:

- cryogenic pipework (loading and vapor return) from the LNG storage tank(s) to the LNG truck-loading area
- flexible cryogenic hoses (loading and vapor return) for filling
- control panel within a shelter
- a turning circle for LNG trucks

The capacity of the LNG trucks would be approximately 12,500 gallons (47 m³) with a loading flow rate of approximately 265 gallons per minute (60 m³/hr). The anticipated volume of LNG to be delivered by truck once the Project is fully operational is about 2,461 m³ per year (650,000 gallons per year). It is currently projected that, on average, one truck would be loaded per week at the proposed facility when operating at full capacity and more LNG fueling stations become operational in Louisiana and neighboring states. The U.S. Energy Information Administration's (EIA's) Alternative Fuel Data from 2011, the most recent EIA analysis data available on point, shows an approximate total of 3,436 LNG-fueled vehicles in the United States in 2011, a strong increase from the approximately 2,640 LNG-fueled vehicles reported for 2003. An estimated 881 of the total 2,640 LNG-fueled vehicles in 2003 were trucks. That number more than doubled to approximately 1,791 LNG-fueled trucks in 2011. (U.S. EIA 2013c)

The numbers of LNG-fueled trucks in the United States continue to increase. In fact, the Department of Energy's Office of Efficiency and Renewable Energy reports that through the efforts of its Clean Cities coalitions,⁴ approximately 3,400 LNG-fueled vehicles were on the

⁴ The Clean Cities program is a national network now comprised of nearly 100 Clean Cities coalitions focused on getting alternative and renewable fuels, idle-reduction measures, fuel economy improvements, and new transportation technologies into the market. The program was established in 1993 pursuant to the Energy Policy Act

roads in the United States in 2012 (U.S. Department of Energy 2014).⁵ In addition, industry analyst Zeus Intelligence⁶ reported earlier this year that of 5,994 LNG-fueled vehicles in the United States, there are 4,522 LNG-fueled trucks (Zeus Development Corporation 2014). This number is expected to continue to grow as companies with large-scale, long-haul trucking needs announce plans to make significant investments in LNG-fueled fleets. For example, international shipping company United Parcel Service (UPS), the largest shipment and logistics company in the world, recently announced that it will purchase 700 LNG tractors, used in tractor trailers, by the end of 2014 (UPS 2014).

Following the commissioning of the first two trains, Magnolia is initially projecting that their market share would allow for approximately 26 trucked cargos annually (12,500 gallons average per cargo) based on the existing LNG fueling stations currently in operation and projected to be constructed in Louisiana and Texas. As the market develops and more LNG refueling stations become operational, Magnolia will seek to add additional market share, doubling the trucked cargos annually from the Magnolia LNG facility.

A transportation study has been conducted and its findings will be coordinated with the Louisiana Department of Transportation and Development and local community representatives to determine the best route to be used for future LNG distribution by trucks to provide access to domestic markets via U.S. Interstate Highway 10. LNG truck routing from the Project site to the U.S. Interstate highway system is discussed in detail in RR 5, "Socioeconomics."

1.1.8 Flare Stacks

The purpose of the pressure relief and flare system is to safely and reliably protect the plant systems from overpressure during start-up, shutdown, plant upsets and emergency conditions. Upset events that require flaring or depressurizing are not planned, and the control system design is designed to prevent such events. Planned flaring is usually associated with system cool down and for planned maintenance shutdown scenarios.

Two separate flares would be provided: 1) cold flare to handle cold relief fluids, and 2) warm flare to handle wet/warm relief fluids. The flares would be adjacent to one another and therefore would share a common flare-stack structure that would be supported by a common guyed wire system. The stack supporting the two flares would be approximately 100 feet in height. During normal operation, no flaring would take place as boil-off gas (BOG) is recovered and utilized as fuel in the CHP plant's auxiliary boiler.

The cold flare would be connected to the vapor return line from ship-loading. This line would feed the LNG tank to maintain tank pressure during ship-loading. The flare would be ignited only when the over-pressure valve opens and when a flammable gas mixture is present at

of 1992 and is part of the U.S. Department of Energy's Vehicle Technologies Office. (National Renewable Energy Laboratory 2013)

⁵ These are self-reported numbers and the information does not distinguish between LNG long-haul trucks and other LNG-fueled vehicles.

⁶ On April 22, 2014, Zeus Intelligence was acquired by Hart Energy.

the flare tip. This is a safety overpressure system and is not designed for use during normal operations. The composition of the flared gas will be per the LNG specification (95.7 percent methane, 0.3 percent propane, 3 percent ethane, 1 percent nitrogen).

The warm flare would be connected to the liquefaction trains and would only flare during plant start-up or process upset conditions. The flared gas would be either the feed gas composition (95.7 percent methane, 0.3 percent propane, 3 percent ethane, 1 percent nitrogen) or LNG composition (similar to above) or MR composition (16 percent nitrogen, 33 percent methane, 39 percent ethane, 12 percent n-butane) or LP fuel gas composition (68 percent nitrogen, 32 percent methane).

1.1.9 Demineralized Water Treatment Plant

Demineralized water would be required for the steam plant and amine plant as makeup water. Groundwater would be used as feed water for the demineralized water treatment plant, along with condensed water produced by the gas turbine inlet air cooling system. Prior to condensing, this air would be finely filtered by the gas turbine inlet air filters. The volume and sources of required demineralized water required is covered in Section 1.1.10.2 and also in RR 2, “Water Use and Quality.” The water treatment system would be designed, supplied, installed, and monitored by a specialist from a water treatment company. The water treatment may include pre-filtering, reverse osmosis, electro-de-ionization, mixed resin bed, and chemical treatment prior to storage. Details about water treatment options would be determined during Front End Engineering Design (FEED).

Reject water from the demineralized water treatment plant would be drained to a holding basin and diluted with stormwater runoff prior to discharge to the Industrial Canal in accordance with LDEQ requirements.

1.1.10 Facility Drainage and Containment

Drainage, containment, and effluent treatment systems would be provided to ensure the proper disposal of effluents from process, service, and surface water streams, as well as domestic effluent from the LNG plant site, in accordance with LDEQ’s requirements.⁷ Magnolia has

⁷ The Louisiana Pollutant Discharge Elimination System (LPDES) is authorized under the USEPA’s delegated National Pollutant Discharge Elimination System (NPDES) program (which is authorized under the Clean Water Act) and promulgated through Louisiana Administrative Code (LAC) Title 33:XI.2503. A water quality certification is required for all projects that obtain a coastal use permit or a Section 404/10 permit.

The LPDES Permit Program is administered through LDEQ under LAC 33:IX.2511.B. For construction activities that disturb five acres of land or more, for applicable activities (clearing, grading, and excavation for construction activities) a Notice of Intent (Form NOI CSW-G) for LPDES Stormwater General Permit LAR100000 must be submitted to LDEQ detailing activities and discharges. The activities and discharges must be protective of T/E species, cultural resources, and total maximum daily load (TMDL) limits on receiving waterbodies, and the requirements of the Stormwater Pollution Prevention Plan (SWPPP) must be met. Coordination with LDWF and the Louisiana State Historic Preservation Officer (SHPO) will be required to discharge stormwater from the proposed Project site. This coordination is typically conducted in coordination with the Section 404/10 permit and the Water Quality Certification (WQC) required under Section 401 of the Clean Water Act.

prepared a draft site-specific operational stormwater pollution prevention plan (SWPPP; see Appendix 2.F in RR 2).

Importantly, no operational process waters would be discharged directly to surface waterbodies. All stormwater would be directed into holding basins for dilution and temperature adjustment to ambient before discharging back into the Industrial Canal.

The following drainage systems would be provided:

- Storm/rainwater runoff from open ground areas outside the plant perimeter road would flow either into the site's perimeter road ditches or with the natural ground contours directed off-site. High point grade lines would be established outside the plant perimeter road to direct the flows as described. Perimeter road ditches would be directed to the East or West holding basins, then overflow into the Industrial Canal. Runoff from rooftops of buildings and shelters would be directed primarily to the natural ground contour flows.
- Storm/rainwater runoff from open ground areas inside the plant perimeter road would flow into the site perimeter road ditches and be directed to the east or west holding basins, then overflow into the Industrial Canal.
- Storm/rainwater runoff in the open ground areas of the plant process area would be directed to the perimeter road ditches around each train. The storm/rainwater runoff would be channeled to the east holding basin, and then allowed to overflow into the Industrial Canal.
- Storm/rainwater collected in process areas requiring non-LNG spill containment would utilize curbing, closed drain systems, troughs and swales to direct the storm/rainwater to either an oily water interceptor or the LNG spill containment system, where it would be directed to the east holding basin, then overflow into the Industrial Canal.
- All LNG equipment and piping systems holding LNG in the process area would be provided with a spill containment system utilizing curbed areas, troughs, open drains, and an impoundment basin to hold LNG spills (refer to RR 11, "Reliability and Safety," for a detailed description and routing of the LNG spill containment system).
- Storm/rainwater runoff in the LNG Tank area would be channeled to the LNG spill impoundment basin where it would be pumped to the west holding basin, and then overflow into the Industrial Canal.

The operational LPDES permit requirements will be determined during FEED, but will likely involve a Notice of Intent under the LPDES Multi-Sector General Permit for stormwater discharges associated with industrial activity. An Operational SWPPP and Spill Plan will be developed dependent on FEED.

- Storm/rainwater for the off-site areas would have curbed areas as required per the equipment and as the system process dictates. These flows would be directed to either an oily water interceptor or an LNG spill containment system, where it would be directed to the east or west holding basin, and then overflow into the Industrial Canal.
- Portable air-driven pumps would be used to pump out the oily water separators to vacuum trucks for disposal off-site in accordance with LDEQ requirements.

1.1.11 Control, Administration, and Workshop Buildings

The following building facilities would be required for the Project:

- **Control Room:** The control room would be located above the administration level to provide a view of the facility. It would include an open area with control and monitoring stations suitable for two operators. Separate rooms would be provided for instrument and electrical equipment and an uninterruptible power supply (UPS)/battery.
- **Administration:** This building would include offices for the plant personnel, spare offices, meeting room, open office area for work stations, kitchen, and bathrooms.
- **Workshop:** The layout, space, and facilities required for the workshop would take into account the specific requirements of the plant equipment to be maintained.
- **Shelters/Houses:** Smaller shelters and buildings to house various equipment may be required as per the relevant standards and guidelines.

1.1.12 Power, Water, and Communications

1.1.12.1 Power Supply Requirements

The total power requirement for each LNG train is 72.5 megawatts (MW), of which 66 MW would be generated from the gas turbines (driving the MR compressors) and approximately 6.5 MW would be imported from the Entergy Gulf States Louisiana, LLC (Entergy) grid.

Within each LNG train, the 66 MW of power required to drive the two General Electric (GE) Nuovo Pignone model BCL805 single-stage centrifugal MR compressors for the separate MR circuits, are generated by two 33MW GE PGT25+G4 gas turbines.

A CHP plant would recover the waste heat from the above-mentioned gas turbines to produce HP steam. This steam would be utilized by steam turbines that would drive the ammonia refrigeration plant within each LNG train, therefore increasing performance of the liquefaction process.

Power from the local Entergy electrical grid would be required to run motors for LNG loading pumps and boil-off gas (BOG) compressors, amine pumps, air coolers, lighting, instrument air package, N₂ generation package, and other minor items. At full plant capacity of 8 mtpa, the Project is expected to import a base load of approximately 26 MW during normal operating hours (24/7). An additional requirement of 5 MW of power (totaling approximately 31 MW) is expected to be imported from the electrical grid when loading LNG carriers, which would take approximately 18 hours each.

When in service, the loading of the smaller LNG barges would require less power and less time (approximately three to four hours to load). The frequency of LNG loading would be on average, one to two LNG carriers per week and an additional one to two LNG barges per week when operating at full plant capacity. Moored LNG carriers and LNG barges and tugs are self-sufficient and supply their own utilities, including their own power supplies.

Entergy, the local power provider, has an existing 230-kilovolt (kV) high voltage (HV) transmission line approximately 1.3 miles to the east-northeast of the Project site, which would be accessed by the Project. Refer to Section 1.12 for additional information on non-jurisdictional facilities. An analysis of potential environmental impacts to expand the service to the Project is provided in the applicable RRs.

Back-up power would be available for the Project. A packaged diesel engine/generator combination, typically referred to as a “genset,” would be used. A genset back-up is a fully standalone power supply that includes a base, enclosure, sound attenuation, control systems, circuit breakers, jacket water heaters, cooling system, starting system, fuel supply day tank, and spill containment system. The genset’s function is to auto-start during a loss of power event to supply back-up power to the plant’s process and safety systems to allow for a safe and controlled shutdown of the facilities. During engineering, procurement, and construction (EPC) design, an emergency load list will be finalized to size the genset back-up power requirements.

1.1.12.2 Water Supply and Sewage Handling

Water Supply and Sewage Handling During Operations

The Project site has access to potable water from the Calcasieu Parish (Ward 3) District 12 Water Works located immediately adjacent to the southeast corner of the Project site. An existing 12-inch water pipeline runs along the entire length of the property just north of Henry Pugh Boulevard. It is expected that this existing 12-inch water pipeline would be sufficient for the Project’s operational potable water needs of approximately 2,000 gallons per day, on average. Discussions with the Calcasieu Parish Engineer, Terry Frelot, confirmed this proposed plan. It is anticipated that no upgrades or improvements would be required. The potable water from Calcasieu Parish District 12 Water Works, sourced from groundwater wells, would be used for plant personnel in buildings, safety showers, and eyewash stations.

Magnolia intends to construct and develop two on-site groundwater wells. During operation, groundwater from these wells would be used for process, service, and plant fire water systems (see RR 2, Section 2.2.4, “Water Use,” and Section 2.2.6, “Operation Impacts and

Mitigation). The depths of these wells would be between 500 and 700 feet. Although two wells are planned, only one well would be used for plant water requirements. The second well would be available for use only if the primary well is out of service during operations. For information regarding water wells present within 0.25 mile of the Project site, please refer to RR 2, Section 2.4.6, "Water Supply Wells."

Each LNG train would produce condensed water during operations when the gas turbine inlet air is cooled by the air inlet chillers, and this would be used to feed the demineralized water treatment plant within each LNG train. It is estimated that 31,700 gallons per day (average) would be produced from the turbine inlet air coolers within each LNG train. In total, all four trains are expected to produce an average of 126,802 gallons per day of condensed water. The water produced from the turbine inlet air coolers would be reused as feed water for the demineralized water treatment plant (refer to Section 1.1.7). Groundwater would be used to supply the balance of water required to feed the demineralized water treatment plant. Current water balance projections for the operational phase of the Project are included in Table 1.1-1.

Table 1.1-1 Estimated Facility Water Requirements at Full Plant Operational Capacity

Water Demand Requirements	Min Total Water Demand	Norm Total Water Demand	Max Total Water Demand
	(gallons per day)		
Demineralized Water Treatment Plant	167,378	210,000	278,964
Service Water	0	90	127
Plant Personnel (General Ablutions, Emergency Showers and Washdown)	740	1,820	3,329
Total	168,118	211,910	282,420

Water Supply Source	Min Total Water Supply	Norm Total Water Supply	Max Total Water Supply
	(gallons per day)		
Proposed Groundwater Wells	167,378	130,090	152,289
Water Generated from the Gas Turbine Inlet Air Coolers	0	80,000	126,802
Calcasieu Parish District 12 Water Works	740	1,820	3,329
Total	168,118	211,910	282,420

The sewage system would be developed to handle all wastewater generated during operation of the planned facility. It is currently anticipated that Magnolia would install a self-contained, aboveground treatment plant and employ a third-party contractor to operate and maintain as an individual system, per title 51 of the Louisiana Public Health-Sanitary Code (http://www.doa.louisiana.gov/osr/lac/Part%20XIII_July2005.pdf).

Water Supply and Sewage Handling During Construction

Water needs for the Project at peak manpower are currently estimated to be about 6,000 gallons a day, with an average of 1,800 gallons per day. Construction wastewater would be collected from construction facilities into holding tanks. The contents of the holding tanks would be removed by licensed vendors via vacuum trucks for proper off-site disposal. The work force, in general, will be serviced by a certified portable toilet vendor with wastewater periodically removed via vacuum trucks for proper off-site disposal.

Dust control would be implemented during construction; however, it is anticipated that dust control would be minimal during the summer months as the site is relatively small and construction would correspond with the rainy season. A standard 2,000-gallon water truck would be used during construction for dust suppression. An estimated 60,000 gallons of water would be used for dust suppression during the first year of site preparation. After site preparation is completed, permanent access roads within the site would be sealed to protect the sub-base.

Magnolia would use an off-site concrete batch plant for all concrete pours required to build the proposed Magnolia LNG plant facility, for additional information please refer to Section 1.5.4.9, “Materials and Equipment Delivery and Off-site Concrete Batch Plant.”

1.1.12.3 Temporary Tie-In Connections for Power and Water Supply During Construction

Magnolia’s proposed construction utility tie-in connections include power and water supply. Power would be connected through an existing 34.5 kV power line that parallels the south side of Henry Pugh Boulevard as depicted on Figure 1.1-8. An overhead power line would be extended over Henry Pugh Boulevard from a pole on the south side of Henry Pugh Boulevard to a pole on the Magnolia site which would drop down to a switch at the base of the pole located within the site. From that location, the electrical contractor would make the proper connections and distributions in accordance with the construction specifications for the Project. Water tie-in connection during the construction phase would be supplied through a fire hydrant fed by the 12-inch water main that parallels Henry Pugh Boulevard on its north side. Figure 1.1-8 shows temporary tie-in connection points for power and water supply during construction.

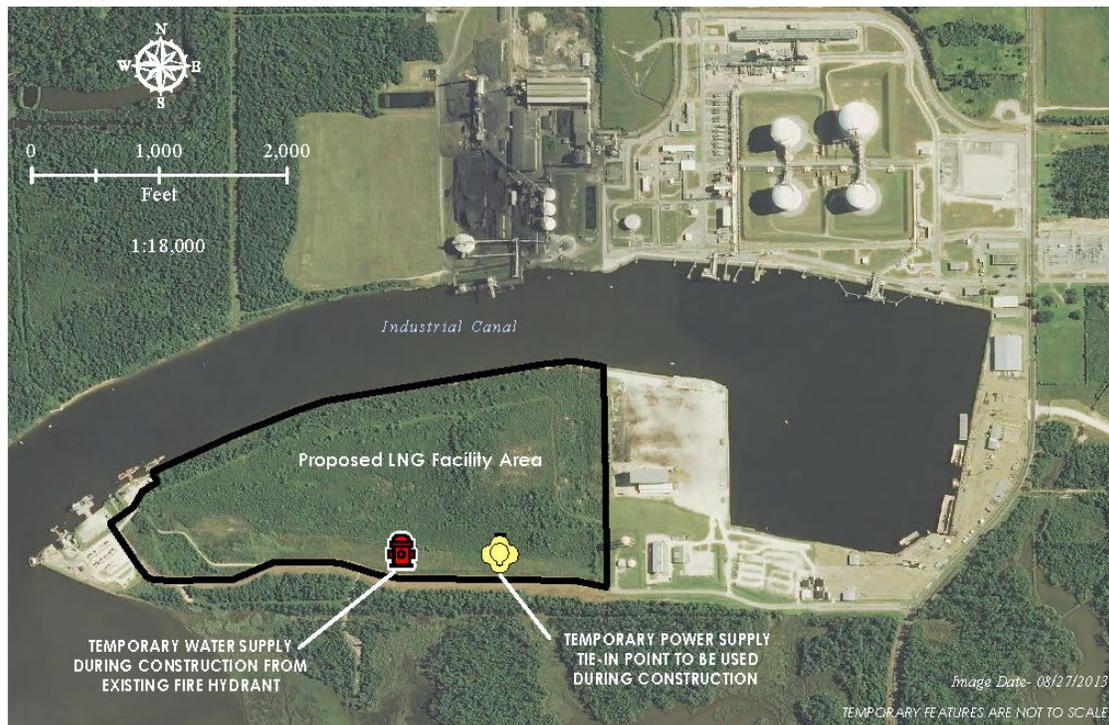


Figure 1.1-8 Temporary Tie-In Connection Points for Power and Water Supply During Construction

1.1.12.4 Communication

The telecommunication system for the Project would comprise the following:

- telephone exchange
- radio system
- computer network
- plant telecommunications network
- electronic mail system for communication
- closed-circuit television (CCTV) system

Communication with the following locations would be required:

- LNG carrier or LNG tug/barge
- local Programmable Logic Controller
- natural gas provider
- local power provider Entergy
- local emergency services
- company head office

The telecommunication systems shall comply with the governmental rules and regulations. Marine band very high frequency (VHF) radios would be provided for communication with the LNG vessels. Access to the control system would be provided to allow remote monitoring of the plant operation by approved parties.

1.2 PURPOSE AND NEED

The purpose of the Magnolia LNG Project is to construct a terminal to serve the domestic and export markets for LNG. The Project would:

- Provide an efficient and cost-effective outlet for the abundant new supplies of U.S. domestic natural gas available in the marketplace.
- Support export of LNG via large LNG carriers between 125,000 and 218,000 m³ capacity.
- Support domestic waterway transportation of LNG in barges of up to 15,000 m³ capacity for use as vessel fuel in shipping and the offshore oil and gas industry.
- Support domestic highway distribution of LNG in trucks of approximately 12,500 gallons (47 m³) capacity to serve the emerging business of providing LNG as fuel for long-haul trucking and other emerging domestic uses of LNG.

Related Project objectives include:

- Minimizing Project environmental impacts by selecting a site near the existing U.S. natural gas pipeline distribution network and minimizing the length of necessary natural gas supply pipeline interconnections.
- Minimizing Project environmental impacts by selecting a site located on an existing deep-draft channel suitable for use by LNG carriers and that minimizes the amount of dredging needed to develop the Project.
- Minimizing Project environmental impacts by selecting a site that can be developed with limited impacts to wetlands or other sensitive habitats.
- Minimizing Project environmental impacts by selecting an LNG liquefaction technology that maximizes thermal efficiency and reduces the amount of Project air emissions per unit of LNG produced by approximately 30%.

1.2.1 U.S. Natural Gas Supply

Magnolia anticipates that the sources of natural gas will include conventional and unconventional supplies from various producing regions, including recent shale gas discoveries in the Haynesville, Eagle Ford, Barnett, Floyd-Neal/Conasauga, and Marcellus shale plays. These shale plays represent a vast supply of natural gas, with a combined area of approximately

100,000 square miles and contain an estimated 553 trillion cubic feet (Tcf) of recoverable gas (U.S. EIA 2011). The size of traditional and emerging natural gas supply sources in proximity to the Magnolia LNG terminal would provide Magnolia's potential customers with diverse and reliable alternative gas supply options.

On August 1, 2013, the EIA released updated information on U.S. dry natural gas reserves showing that proved reserves as of December 31, 2011, reached 334.07 Tcf, while production increased to 23.56 Tcf (U.S. EIA 2013a). Most recently, the EIA estimated that proved U.S. natural gas reserves declined in 2012 due to low prices, but it anticipates the reserves for 2013 will be positively affected by the price recovery from 2012 to 2013 (U.S. EIA 2014). This updated information supports the conclusion that domestic natural gas supply as measured by proved natural gas reserves has been increasing and that a growing supply of natural gas is available under existing economic and operating conditions (U.S. Department of Energy 2013a). The Magnolia LNG Project seeks to use the increasing supply of U.S. natural gas to serve the U.S. domestic and export markets for LNG.

1.2.2 LNG as Vessel Fuel

LNG is increasingly being considered as a fuel for large and small marine vessels, both in the United States and around the world. The Project is being designed to meet that need. Several factors are motivating vessel owners and operators to consider using LNG as vessel fuel including reduced cost of fuel compared to diesel and the need to reduce air emissions to comply with international environmental requirements for ships. The marine industry has employed natural gas fuel in the LNG carrier fleet for many years; however few other large ships have been outfitted for natural gas due the historic lower cost of heavy fuel oil.

Annex VI of the International Maritime Organization (IMO) Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78), outlines international requirements for vessel air emissions and shipboard air pollution prevention measures. MARPOL 73/78 Annex VI entered into force for the United States on January 8, 2009. Starting on that date, U.S. ships operating anywhere and foreign-flag ships operating in U.S. waters must comply with the requirements set out in MARPOL Annex VI (USCG 2012a).

On March 26, 2010, IMO adopted amendments to MARPOL Annex VI, by resolution MEPC.190(60) to designate the new North American Emissions Control Area (ECA) and in July 2011 by resolution MEPC.202(62) to designate the U.S. Caribbean Sea ECA (USCG 2012a). The North American ECA entered into force on August 1, 2011, and took effect on August 1, 2012. The U.S. Caribbean Sea ECA entered into force on January 1, 2013, and took effect on January 1, 2014. The boundaries of the North American ECA are shown on Figure 1.2-1.

Ships subject to MARPOL Annex VI operating within the U.S. and Caribbean ECAs will be subject to stricter air emissions guidelines than those operating outside the ECAs, especially regarding the amount of sulfur allowable in the ship's fuel oil. Ship fuel sulfur levels within ECAs are significantly reduced in comparison to non-ECA areas. Current and future ship fuel sulfur requirements are shown in Table 1.2-1.



Source: U.S. Environmental Protection Agency 2010.

Figure 1.2-1 Map of the North American Emission Control Area (ECA)

Table 1.2-1 MARPOL Annex VI Fuel Sulfur Requirements

Fuel Sulfur Standard (max percent by Weight)			
Global Sulfur Cap		Emissions Control Area Sulfur Cap	
On and after Jan. 1, 2012	3.50%	On and after Aug 1, 2012	1.00%
On and after Jan. 1, 2020	0.50%	On and after Jan. 1, 2015	0.10%

Source USCG 2012a.

A recent report observed that low natural gas prices in the United States and LNG prices below the Brent crude oil price in Europe provide incentives to move to LNG-fueled vessels as a means of meeting the 0.1 percent sulfur limit that will become effective in 2015 (Adamchak and Adede 2013). LNG is a potential solution for meeting these ship fuel oil sulfur limits since it has virtually no sulfur content and its combustion produces low levels of nitrogen oxide (NO_x) compared to marine fuel oil and marine diesel oil. Not only is LNG cleaner-burning, but it may have economic advantages on a heating value basis when compared to global bunker fuel prices (Adamchak and Adede 2013).

The advantage of potentially lower fuel cost combined with reduced air emissions means that LNG is increasingly being considered as a potential marine fuel source in many areas. Currently, six LNG-fueled offshore supply vessels (OSVs) are under construction by Harvey Gulf Marine to serve the offshore oil and gas industry along the U.S. Gulf Coast (Tita 2013). In anticipation of new build and vessel conversions using LNG fuel systems, the USCG recently issued a policy letter providing interim guidelines for the design and approval of shipboard LNG fuel systems since current regulations do not fully address these requirements (USCG 2012b).

On November 7, 2013, the U.S. Maritime Administration announced a \$1.4 million grant to support the increased use of LNG as a marine transportation fuel, including \$900,000 to Horizon Lines, Inc. for conversion of a specific vessel, and \$500,000 to Det Norske Veritas for a study to analyze the issues and challenges associated with LNG bunkering, which is the process of supplying fuel for ships, and the landside infrastructure needed to store and distribute LNG (U.S. Department of Transportation, Maritime Administration 2013).

The Magnolia LNG Project would have the ability to load LNG barges that could further distribute the LNG to ship and OSV fueling facilities in the region. Ships and OSVs would not be directly fueled/bunkered at the Project site. LNG barges loaded at the Project site would make bulk deliveries to the ship fueling facilities and OSV shore bases in the region. Magnolia has not yet established contracts with shipping companies or OSV operators to supply LNG as vessel fuel. However, this is an emerging business area that will be stimulated by recent establishment of the North American ECA. Major deep-draft port facilities along the central Gulf Coast that could be supplied by the Magnolia LNG Project include:

- Port of Lake Charles, Louisiana
- Port of New Orleans; Louisiana
- Port of South Louisiana, Louisiana
- Port of Baton Rouge, Louisiana
- Port of Port Arthur, Texas
- Ports of Houston/Galveston, Texas

LNG barges would also be capable of delivering LNG to OSV shore bases along the central Gulf Coast including:

- Port Fourchon, Louisiana
- Port of Iberia, Louisiana

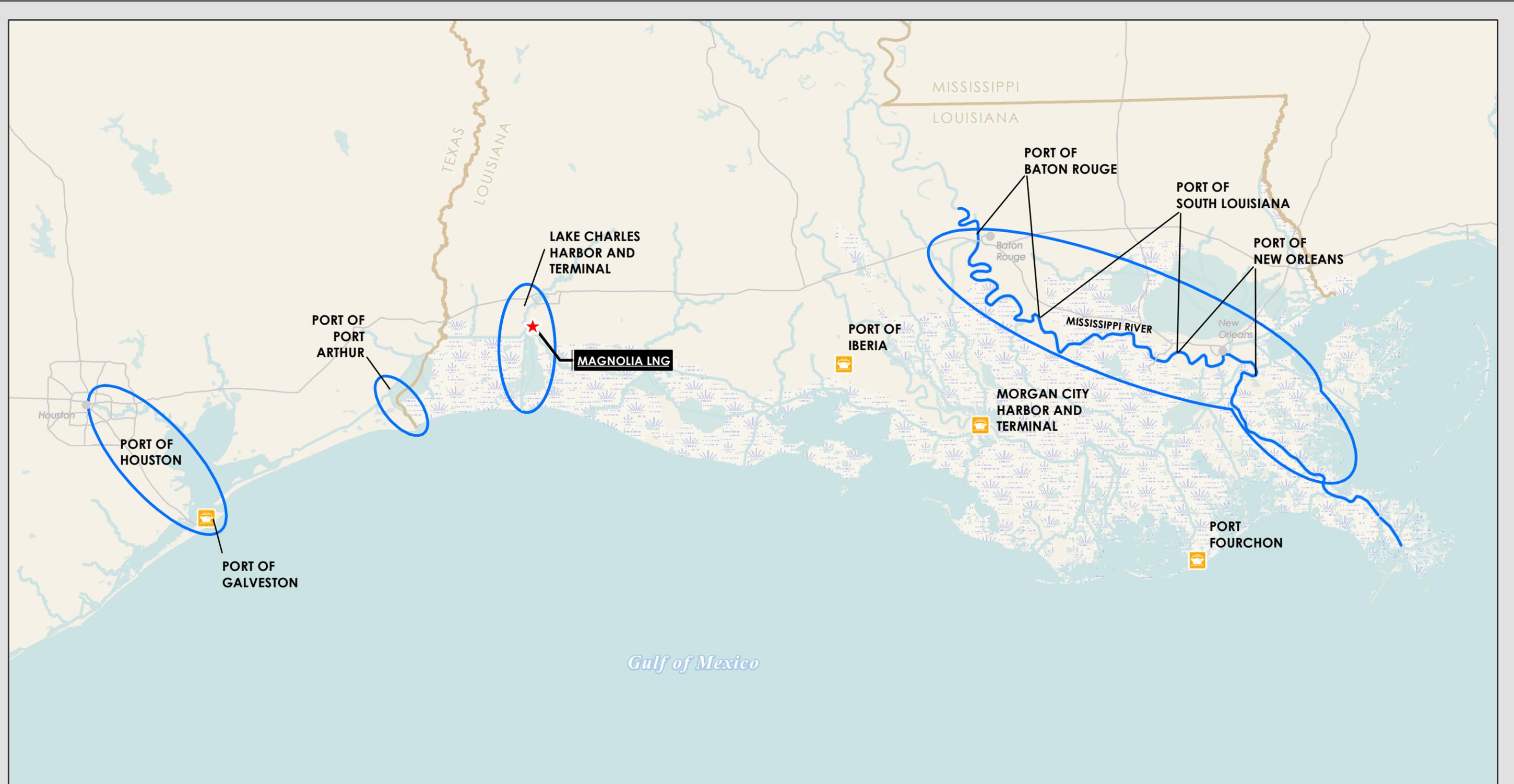
- Port of Morgan City, Louisiana
- Port of Galveston, Texas

Figure 1.2-2 shows the locations of deep-draft port areas and major OSV supply bases that could represent future delivery points for LNG produced by the Magnolia LNG Project. Since no contracts have been established between Magnolia and shipping companies to supply LNG as vessel fuel, it is not currently possible to describe actual shipping routes to be utilized or the frequency of deliveries. The USCG will be in charge of determining the suitability of waterways to support LNG vessel transportation and Magnolia will continue to engage the USCG to assess the safety and security of LNG vessel transportation as this market continues to develop. The USCG's full WSA process for LNG transportation is described in USCG Navigation and Vessel Inspection Circular No. 01-2011, "Guidance Related to Waterfront Liquefied Natural Gas (LNG) Facilities" (USCG 2011).

LNG would be transferred from the LNG barge to the port or OSV fueling facility in generally the same way that it is currently transferred between LNG ships and approved LNG waterfront facilities. All waterfront facilities that transfer LNG must be designed, constructed, and operated to comply with the USCG's LNG facility regulations in 33 CFR Part 127. These regulations include requirements to develop an LNG Operations Manual and an Emergency Manual. Each LNG transfer would require a preliminary transfer inspection (33 CFR 127.315), completion of a Declaration of Inspection (33 CFR 127.317) to ensure that all systems and procedures are satisfactory to start the transfer, and compliance with the LNG transfer regulations in 33 CFR 127.319. These same requirements will apply to the specialized barges transferring LNG to port facilities and OSV supply bases. Any transfer of LNG as a marine fuel between vessels is also required to meet the requirements of 33 CFR 155 and 33 CFR 156.

Magnolia is aware that the USCG is developing detailed policy guidance to clarify the applicability of existing regulations to the transfer of LNG for use as vessel fuel. USCG (CG-OES) Policy Letter No. 01-14, "Guidelines for Liquefied Natural Gas Fuel Transfer Operations and Training of Personnel on Vessels Using Natural Gas as Fuel" (USCG 2014a), as well as Policy Letter No. 02-14 "Guidance Related to Vessels and Waterfront Facilities Conducting Liquefied Natural Gas (LNG) Marine Fuel Transfer (Bunkering) Operations" (USCG 2014b), are currently in draft form and were recently circulated to the public and marine industry for comments. Magnolia filed comments with the USCG on these policy letters on March 6, 2014. Once finalized, these draft policy letters will provide additional guidance to vessel and waterfront facility owner/operators on the safety, security, and training requirements for vessels and facilities transferring LNG for use as vessel fuel. Magnolia will adhere to the applicable USCG regulations and the guidelines established by these two documents, as well as any other guidance that should be promulgated by the USCG prior to Magnolia LNG's commissioning date.

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**Figure Figure 1.2-2
Possible Ports to Receive
LNG from Magnolia LNG**
Magnolia LNG
Calcasieu Parish, Louisiana

Legend

- ★ Magnolia LNG Site
- 🚚 Major Offshore Support Port Area
- Deep Draft Port Area



0 10 20 Miles

1:1,700,000



Source- ESRI 2012, USACE 2006

Date: 3/28/2014

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1.2.3 LNG as Domestic Highway Fuel

Magnolia would have a truck loading facility to serve the regional needs for LNG highway fuel for long-haul trucks. It is also possible that the LNG trucks could supply local/regional marine fueling facilities as that marketplace emerges.

LNG highway transportation refueling stations generally receive their LNG supply from a liquefaction plant via LNG trucks specially designed to distribute cryogenic fuels. At the refueling site, LNG is offloaded into the facility's storage system. To support long-haul, heavy-duty trucks moving goods throughout the United States, LNG truck fueling stations along major interstate corridors are required. Numerous recent announcements by Clean Energy Fuels and Royal Dutch Shell have described plans for opening a series of LNG highway refueling stations (Environmental Leader 2012; FuelFix 2013). In 2012, Clean Energy Fuels met its goal of completing 70 LNG truck fueling stations (Environmental Leader 2012). The company, one of the largest providers of natural gas fuel for transportation in the United States, plans to build another 70 to 80 LNG fueling stations adjacent to long-haul trucking routes and around major warehouse distribution centers in 2013. Figure 1.2-3 shows the first phase of the Clean Energy Fuels LNG trucking corridor.

Operating LNG refueling stations in Louisiana and Texas are depicted on Figure 1.2-3 and include the following (U.S. Department of Energy 2013b):

- Interstate 49 in Freirson, Louisiana
- Interstate 10 in Baytown, Texas
- Highway 290/Interstate 610 intersection in Houston, Texas
- Richey Road and Interstate 45 intersection in Houston, Texas
- Bonnie View Road and Interstate 20 intersection in Dallas, Texas
- 4600 Irving Boulevard (Highway 386) in Dallas, Texas

Information on the weekly LNG long-haul truck visits to the LNG refueling stations closest to the Magnolia LNG terminal is not publicly available. Magnolia currently is exploring whether it may be able to purchase this information and will update FERC accordingly. Magnolia engaged in extensive research in an effort to obtain this information from a variety of sources, including the EIA, the USDOT's Federal Motor Carrier Safety Administration, the USDOT's Bureau of Transportation Statistics, the USDOT's Federal Highway Administration's Texas Division, the Texas Department of Transportation, the Texas Commission on Environmental Quality's Air Permits Division, the LDEQ's Air Permits Division, the Transportation Research Board, the Texas Railroad Commission, the Texas Department of Motor Vehicles, the Texas Department of Public Safety, a number of trade associations, the LNG refueling stations, and industry news and trade press.

1.2.4 Anticipated Growth of the LNG Trucking Industry

Regarding the anticipated growth of the LNG trucking industry, including LNG refueling trucks and LNG long-haul trucks, projections and market information demonstrate significant

anticipated growth over the next 5 to 10 years. The EIA stated in its Annual Energy Outlook (AEO) 2013 Reference Case, “fuel switching to natural gas in the form of compressed natural gas (CNG) and LNG already is projected to achieve significant penetration of natural gas as a fuel for heavy-duty trucks. In the Reference [C]ase, natural gas use in heavy-duty vehicles increases to 1 trillion cubic feet per year in 2040, displacing 0.5 million barrels per day of diesel use” (U.S. EIA 2013b). This growth will be driven by a number of factors, including the lower price of natural gas compared to diesel, as well as government-driven initiatives including emissions standards for heavy-duty trucks, anticipated fuel efficiency standards for heavy-duty trucks, and potential tax incentives.

1.2.4.1 Projections and Market Information

The number of LNG fueling stations, key to increasing the viability of LNG-fueled truck fleets, is projected to rise. In AEO2010, the EIA reported 38 then-existing LNG fueling stations in the United States (U.S. EIA 2013b). The Department of Energy’s Fueling Station Locator now lists 50 LNG refueling stations in the United States (U.S. Department of Energy 2013b). However, that number may under-report the number of stations. In a January 30, 2014, report, Zeus Intelligence states that there are 74 LNG fueling stations operating in the United States (Zeus Development Corporation 2014) and the number is expected to grow significantly over the next 5 to 10 years.

UPS (2014) has announced plans to open four new LNG refueling stations in 2014. Zeus Intelligence’s LNG Fuel Stations Database lists approximately 47 LNG fueling stations as “planned/under construction” (Zeus Development Corporation n.d.) and Clean Energy Fuels Corporation lists nearly 95 LNG fueling stations as “coming soon” (Clean Energy Fuels 2014). In addition, Shell and TravelCenters of America, LLC (TA) have announced an agreement to make a substantial investment in LNG fueling infrastructure with the goal of providing “the potential for the first-ever coast-to-coast LNG-fueled commercial transport network” (Shell 2013a). Their phased plan includes the construction of “at least two LNG fueling lanes and a storage facility at up to 100 existing TA and Petro Stopping Centers branded full service travel centers along the U.S. Interstate highway system” (Shell 2013a). Early last year, Shell also announced its final investment decision on two small-scale liquefaction units that it envisions “will form the basis of two new LNG transport corridors in the Great Lakes and Gulf Coast regions” to serve marine vessels and heavy-duty vehicles (Shell 2013b).

As the number of LNG fueling stations is expected to increase, so are the number of LNG-fueled trucks. In its AEO2014 Early Release, the EIA projects that in 2024, a total of 20,462 heavy-duty LNG-fueled trucks and an additional 16,527 medium-duty natural gas-fueled trucks will be in stock in the United States, the majority of which will be LNG-fueled (U.S. EIA 2013d). The EIA data show those numbers continuing to rise exponentially through 2040, when the heavy-duty LNG truck stock reaches 396,669 trucks and the medium-duty natural gas-fueled trucks reach 22,618 (U.S. EIA 2013d).

Announcements from major market participants also support the anticipated growth of LNG-fueled trucks in the United States. In addition to UPS’s announcement that it will purchase 700 LNG tractors, used in tractor trailers, by the end of 2014 (UPS 2014), Lowe’s last year

announced its goal to replace its entire diesel-powered dedicated fleet to natural gas trucks by the end of 2017 (Lowe's 2013). As part of a \$38.7 million initiative aimed at improving air quality and reducing greenhouse gases, commercial transportation and logistics provider Ryder System, Inc. (2014) has announced plans to deploy 202 heavy-duty, natural gas-powered trucks.

1.2.4.2 Lower Cost Fuel

As previously noted, one factor driving increased demand for heavy-duty LNG trucks is the low cost of LNG as compared to diesel in the United States. As the EIA notes in AEO2013, “[t]he fuel cost advantage is expected to be large enough in the view of a significant number of operators to offset the considerably higher acquisition costs of vehicles equipped to use [CNG and LNG]. . .” (U.S. EIA 2013b). Even with the number of natural gas vehicles worldwide forecasted to reach 1.9 million by 2022 (Navigant Consulting, Inc. 2014), the EIA’s AEO2014 Early Release projects that natural gas prices will remain low through 2040 relative to other global markets (U.S. EIA 2013b). The projected longevity of comparatively low natural gas prices supports continued growth in LNG-fueled trucks.

1.2.4.3 White House Initiatives

A number of initiatives from the White House could further fuel this projected development. Following President Barack Obama’s February 18, 2014, speech detailing a crucial piece of his Climate Action Plan (The White House 2014a), the President directed USEPA Administrator Gina McCarthy and Transportation Secretary Anthony Foxx to issue a Notice of Proposed Rulemaking on fuel efficiency and greenhouse gas emissions for heavy-duty trucks by March 2015, with final issuance a year later (The White House 2014b). At 20 to 30 percent lower average greenhouse gas emissions (Natural Gas Vehicles for America 2013), LNG-fueled vehicles are likely to be a significant element of the industry’s response to these new regulations.

The President also outlined a series of tax incentives for LNG-fueled vehicles and fueling stations as a supplemental element of his plan to reduce greenhouse gas emissions in heavy-duty trucks (Natural Gas Vehicles for America 2013). President Obama proposed that the federal government issue “new tax credits to companies that manufacture heavy-duty alternative-fuel vehicles and those that build fuel infrastructure so that trucks running on biodiesel or natural gas have more places to fill up” (The White House 2014a). The President’s Fiscal Year 2015 budget request also includes an investment of \$2 billion over the next decade from “Federal oil and gas development revenue, which would be placed in a new Energy Security Trust and help to provide a reliable stream of mandatory funding for research and development for alternative fuels such as domestically-produced natural gas” (The White House 2014c). These items, all part of the President’s Fiscal Year 2015 budget request, point to this Administration’s continued support of natural gas as a transportation fuel and support the likely continued growth in LNG-fueled trucks.

1.2.5 Environmental Objectives

The Project has a number of environmental objectives that were important in the site selection, pipeline strategy, and LNG liquefaction process selection. These objectives included:

- Selecting a site located near the existing U.S. natural gas pipeline distribution network and minimizing the length of necessary natural gas supply pipeline interconnections.
- Selecting a site located on an existing deep-draft channel suitable for use by LNG carriers and that minimizes the amount of dredging needed to develop the Project.
- Selecting a site that can be developed with limited impacts to wetlands or other sensitive habitats.
- Selecting an LNG liquefaction technology that maximizes thermal efficiency and reduces the amount of Project air emissions per unit of LNG produced.

The proposed Project has been designed to meet these Project objectives.

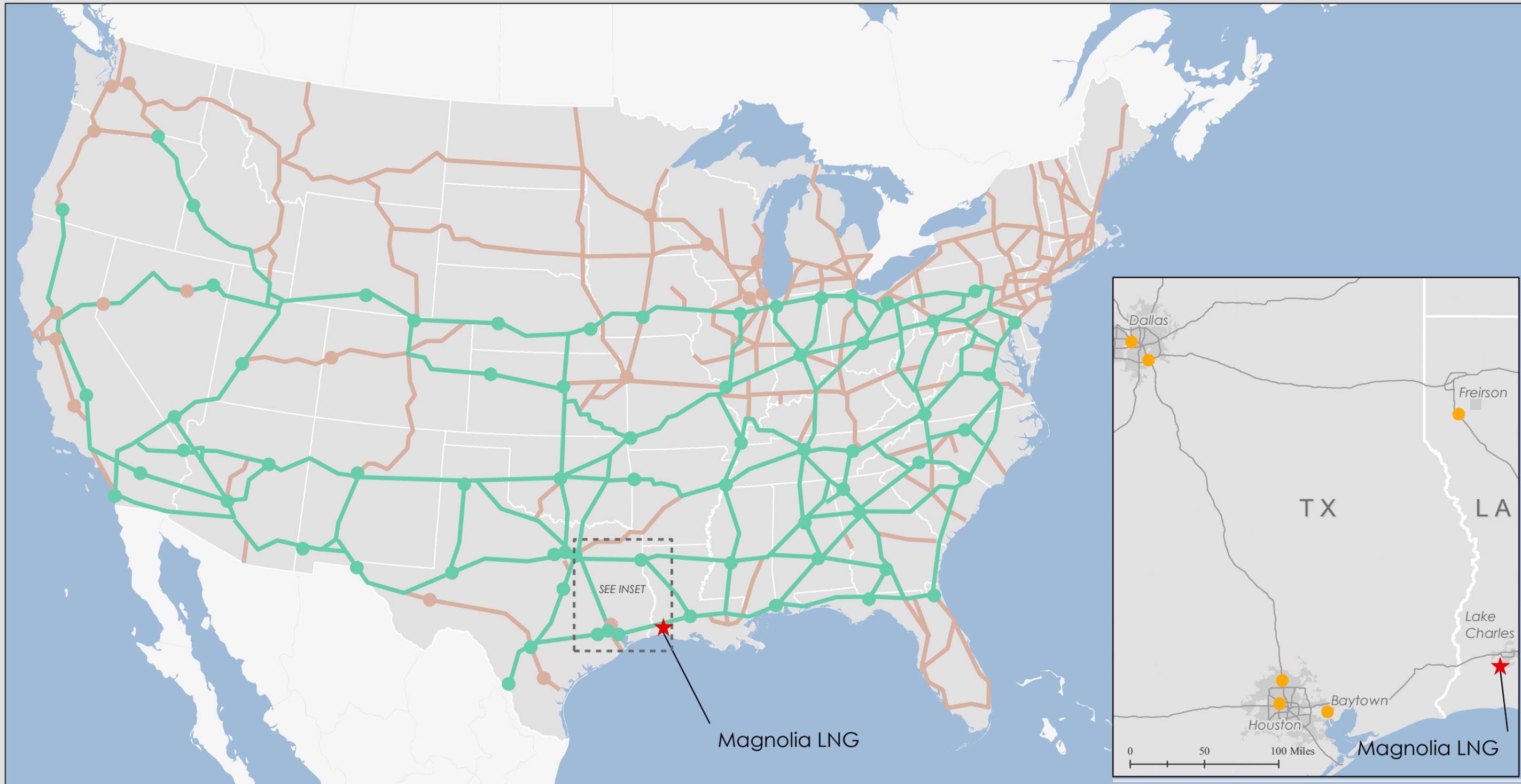


Figure 1.2-3
LNG Trucking Corridors Coast to Coast/LNG Truck Fueling Stations

Magnolia LNG
Calcasieu Parish, Louisiana

Legend

- 2012 Stations
- 2013 Stations
- Operational LNG Refueling Stations Closest to Magnolia Site (inset)
- 2012 Corridors
- 2013 Corridors
- Interstate Highway (inset)



0 100 200 Miles
1:15,600,000

Source- ESRI 2011, Clean Energy Fuels 2013, US DOE 2013
Date: 4/23/2014

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1.3 LAND REQUIREMENTS

The Project would require approximately 115 acres of land along the south shore of the Industrial Canal on Port of Lake Charles Tract 475. The Industrial Canal is located off the main Calcasieu River Ship Channel, as shown on Figure 1.1-3. Magnolia has executed an exclusive option agreement with the Port District that allows Magnolia the exclusive right to lease the site for an initial 30-year term, with four ten-year optional extensions.

Two 160,000 m³ LNG storage tanks would be constructed on the Project site. The LNG liquefaction modules and associated gas turbines and gas processing equipment would be constructed off-site in existing construction/fabrication yards located in southwest Louisiana or elsewhere depending on vendor selection. This would reduce the land requirements necessary for equipment storage or laydown areas on the Project site. The Magnolia team has completed site visits to several existing fabrication yards in the Gulf Coast region. Fabrication yards are large, open work areas that can accommodate a multitude of different fabrication requests. Upon award of a fabrication order, the fabrication company prepares its yard to meet the requirements and specifications of the fabrication order, which includes laying out a work plan to meet the requirements of the fabrication order. Due to the ongoing negotiations with the fabrication vendors, it is not prudent for Magnolia to name the intended fabrication yard owners and location until awarded.

Magnolia plans to use an existing construction yard owned by Dynamic Industries, Inc. (DII) and located immediately to the east of the Project site for marine deliveries⁸ (see Figure 1.3-1). The DII Lake Charles facility is located 12 miles south of the city of Lake Charles at the intersection of the Calcasieu Ship Channel and the Gulf Intracoastal Waterway. The facility is 22.4 miles north of the Gulf of Mexico. The DII facility performs structural steel fabrication and welding process piping fabrication assembly and hydrotesting, coating, electrical and instrumentation installation. There are two main fabrication shops on the DII site. The structural fabrication shop is 100 feet wide, 300 feet long, and 90 feet tall. The shop has three 20-ton overhead cranes with a maximum hook height of 75 feet. This shop is used for structural modular sections and is used to assemble large components indoors, which prevents weather delays on fast-track projects. The piping fabrication shop is 200 feet wide by 200 feet long. It contains two 20-ton overhead cranes with a maximum hook height of 22 feet. This fabrication shop is versatile and can be used either as a pipe fabrication shop or a secondary steel fabrication shop. An additional shop contains two separate warehouse areas and a mechanic shop. The warehouse is used to store weather-sensitive products.

The DII facility is capable of fabricating and shipping structures up to 12,000 tons. Structures can be loaded onto trucks and barges using cherry-pickers or crawling cranes. This facility has 1,100 feet of bulkhead and can accommodate a barge up to 175 feet wide, 400 feet long, and 25 feet in depth. For large structures that are loaded onto barges or ships, DII uses self-propelled modular transporters (SPMTs) to load the structures.

⁸ Discussions with Dynamic Industries Inc. (DII) on the use of facilities at their adjacent Lake Charles construction yard are ongoing. As such, the areas within the DII facility described for use in conjunction with the Magnolia LNG Project are preliminary and subject to change (see Appendix 1.D).

The LNG liquefaction process modules to be constructed off-site would be offloaded at the existing DII dock and transported across land via a heavy-haul road to the erection point at the Project site. Likewise, any other large equipment or material that requires delivery by vessel would use the existing DII dock. Barge unloading would be done in the location of the “crane pad” that is indicated within the area shown on Figure 1.3-1. No in-water activities are required as modules would be transferred from the barge and into final position using SPMTs. The SPMTs would wheel each process module sequentially into position and then lower each module onto piled supports. Smaller modules would be lifted using crane(s), as necessary. Equipment may, at times, be lifted over the water as the crane swings the load around. The relationship of the DII facility and dock to the Project site is shown on Figure 1.3-1. As a result, a construction and/or supply dock or berth would not be built specifically for the Project.

In addition, Magnolia plans to establish a contract agreement for the use of the DII facilities for temporary parking by construction workers (first two to three months after mobilization to the site to perform site preparation, clearing, and grubbing activities) and for an additional staging area during construction of the proposed facility. Additional construction activities would include a heavy-haul road between the Project site and the DII facility. The requirement for laydown areas during construction is included within the approximately 115-acre Project site; the existing DII facility would be used for staging purposes only.

Table 1.3-1 and Figure 1.3-2 identify the construction workspace areas and total acreage of land that would be affected on the Project site.

Table 1.3-1 Land Acreage Affected by Construction Workspace Areas on the Magnolia LNG Project Site

Facility Component	Area (acres)
Heavy-Haul Access Road	7.5
Heavy-Haul Road Laydown Area	1.6
Internal Roads	3.3
LNG Tank Laydown Area	19.0
Marine Laydown Area	2.3
Meter Station Laydown Area	1.3
Miscellaneous Laydown Area	17.5
Other Site Preparation and Grading	56.9
Construction Parking	3.2
Temporary Office Area	1.4
TOTAL	114.0

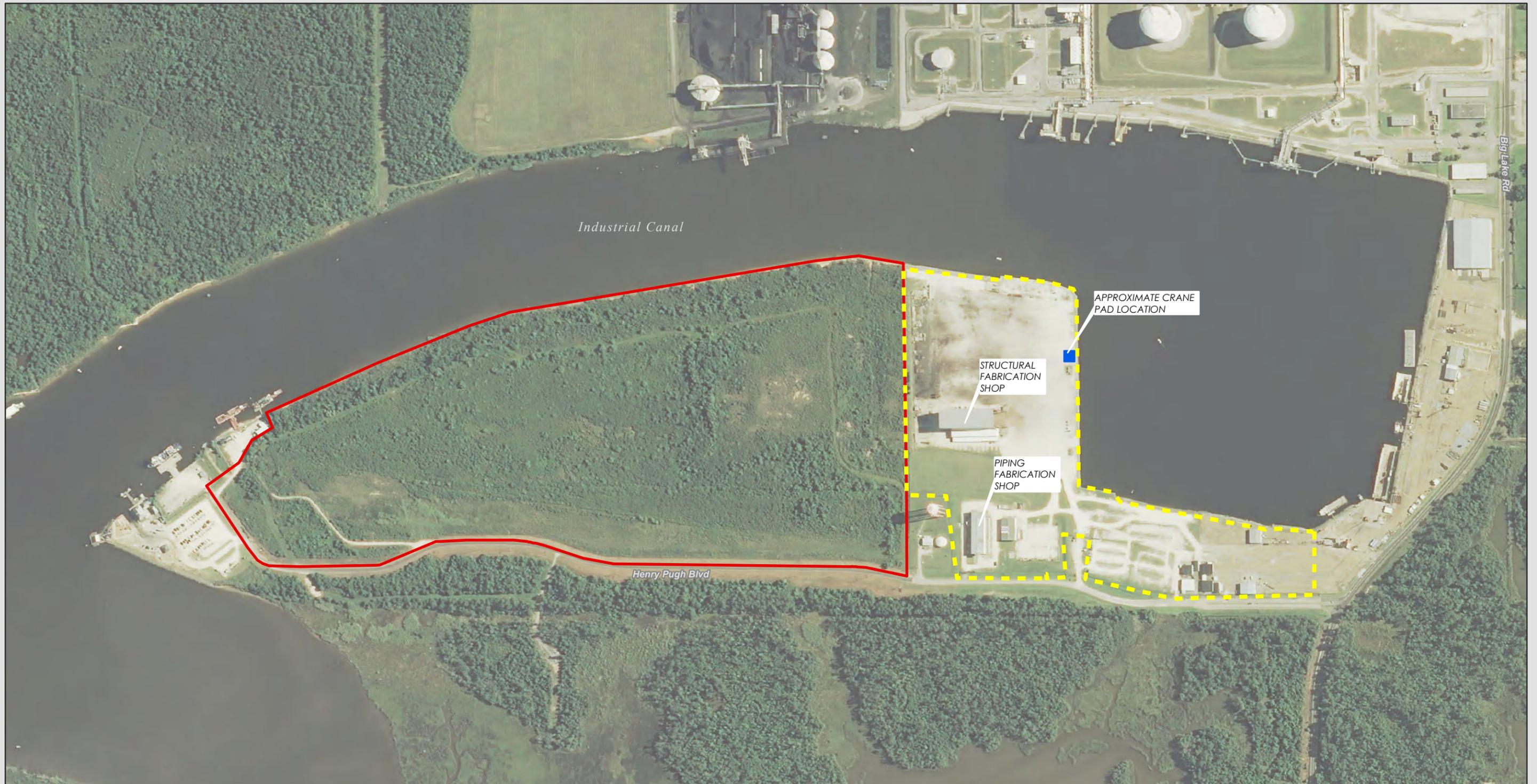


Figure 1.3-1
Magnolia LNG Project Site Boundary
Map in Relation to Existing Yard
Owned by Dynamic Industries, Inc

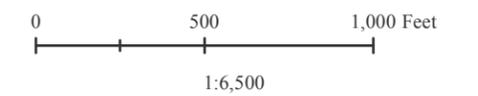
Magnolia LNG
Calcasieu Parish, Louisiana

Legend

-  Proposed LNG Facility Boundary  Dynamic Industries Facility  Approximate Crane Pad Location

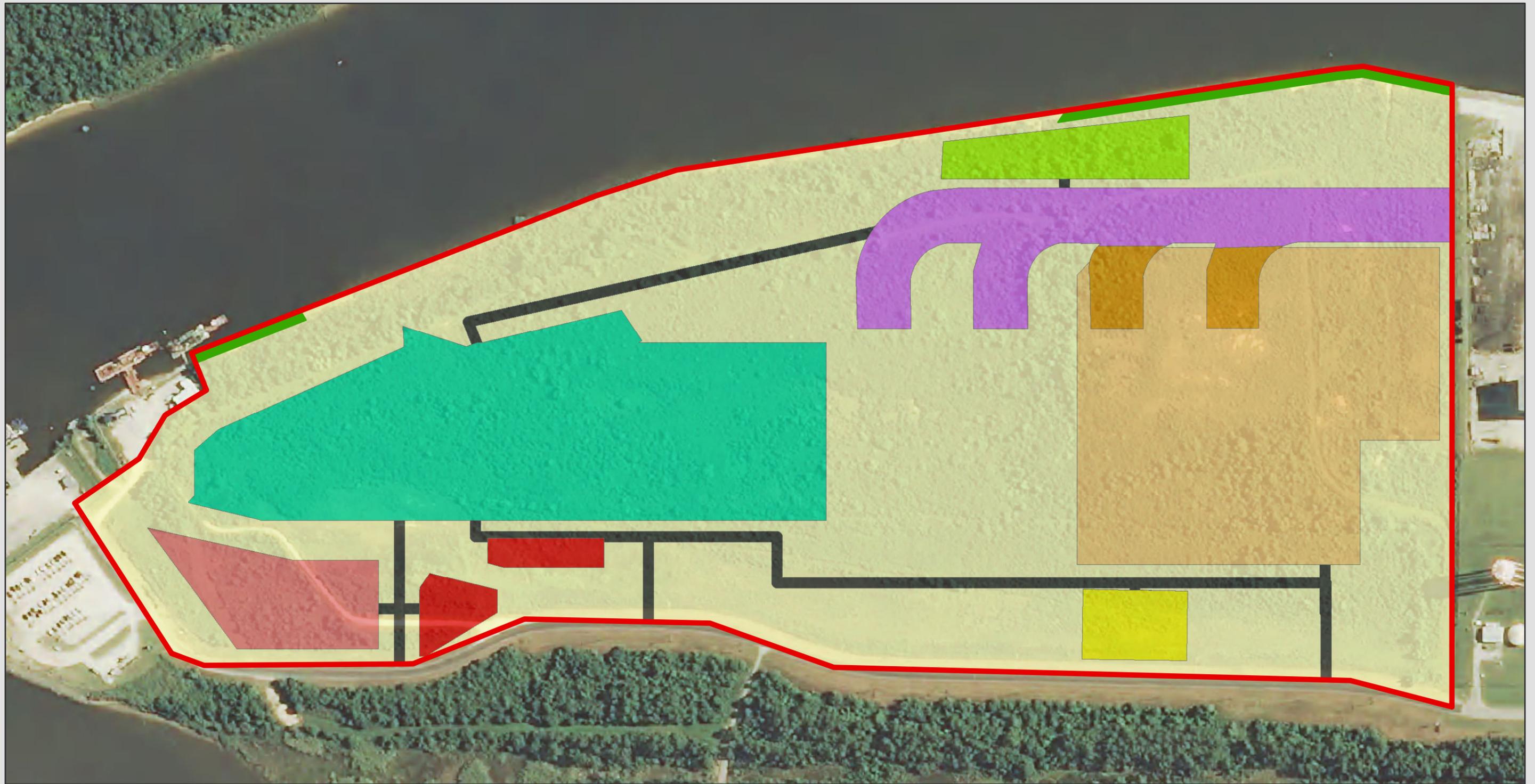


MAGNOLIA
LNG



Source- ESRI 2011-2012, NAIP 2013
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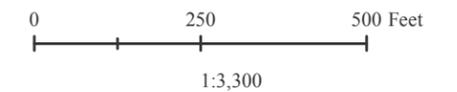


**Figure 1.3-2
Construction Laydown Areas on
the Magnolia LNG Project Site**

Magnolia LNG
Calcasieu Parish, Louisiana

Legend

- | | | |
|--------------------------------|------------------------------|------------------------------------|
| Proposed LNG Facility Boundary | Marine Laydown Area | Other Site Preparation and Grading |
| Heavy Haul Access Road | Meter Station Laydown Area | Construction Parking |
| Internal Roads | Miscellaneous Laydown Area | Temporary Office Area |
| LNG Tank Laydown Area | Heavy Haul Road Laydown Area | Undisturbed Area |



Source- ESRI 2011, NAIP 2013
Image Date- 08/27/2013
Date: 4/14/2014

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Table 1.3-2 and Figure 1.3-3 identify the temporary workspace areas and total acreage of land that would be affected at the DII construction yard. Magnolia would use existing local roadways to access the Project site during construction and operation. Currently, there are no existing roads on the Magnolia LNG plant site. Magnolia would construct a new heavy-haul road to transport the equipment from the existing DII construction yard and dock area to the Project site. Magnolia does not anticipate that any improvements to existing off-site roadways would be needed for construction and operation of the facility (refer to RR 8 “Land Use, Recreation and Aesthetics;” Section 8.2.1 “Land Use Requirements”).

Table 1.3-2 Land Acreage Affected by Construction Workspace Areas on Dynamic Industries, Inc. Yard Facilities^(a)

Facility Component	Area (acres)
Mobilization Parking Area	0.4
Temporary Module and Miscellaneous Materials Staging Area	4.8
TOTAL	5.2

Notes:

(a) Discussions with DII on the use of facilities at their adjacent Lake Charles construction yard are ongoing. As such, the areas within the DII facility described for use in conjunction with the Magnolia LNG Project are preliminary and subject to change.

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**Figure 1.3-3
Construction Areas
at the DII Construction Yard**

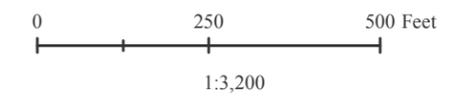
Magnolia LNG
Calcasieu Parish, Louisiana

Legend

- | | |
|--|---|
|  Proposed LNG Facility Boundary |  Mobilization Parking Area |
|  Dynamic Industries Facility |  Temporary Module and Miscellaneous Materials Staging Area |



**MAGNOLIA
LNG**



Source- ESRI 2011, NAIP 2013
Image Date- 08/27/2013
Date: 4/14/2014

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Table 1.3-3 and Figure 1.3-4 identify the total acreage of land that would be affected by the operation of all Project components. Approximately 59 acres, or 54 percent of the site, would be impervious (i.e., pavement, buildings); 16 acres, or 14 percent, would be semi-pervious (i.e., compacted aggregate or packed soils); and the remaining 35 acres, or 32 percent, would consist of grassy surfaces, such as a upland meadow where vegetation is maintained in a graminaceous or weedy state due to mowing activities (if impacted by construction activities), or remaining existing habitat with no facility infrastructure or potential drainage from facility infrastructure.

Magnolia would use existing local roadways to access the Project site during operation. Currently, there are no existing roads on the Magnolia LNG plant site. Magnolia would construct internal roads and parking as shown on Figure 1.3-4. For dimensions of internal roads, please refer to Figure 1.3-4. Magnolia does not anticipate any improvements to existing off-site roadways that would be needed for construction and operation of the facility (refer to RR 8 “Land Use, Recreation and Aesthetics;” see Section 8.2.1 “Land Use Requirements”).

Table 1.3-3 Land Acreage Affected by Operation of the Project

Facility Component	Operational Area (acres)		
	Impervious Areas	Semi- pervious Areas	Pervious Areas
Control, Administration and Workshop Buildings	0.3		
Demineralized Water Treatment Plant	0.1		
Facility Drainage and Containment	1.2		
Flare Stack	0.4	0.7	
Gas Gate Station and Interconnect Pipeline	0.2	0.5	
LNG Storage	15.5		
LNG Trains	22.9		
LNG Truck Loading	0.2		
LNG Vessel Loading	2.4		5.7 ^(a)
Power, Water and Communications	0.7	0.8	
Security, Support and Standby Tug Berthing	0.1		
Internal Roads and Parking	9.3	1.3	
Other Site Preparation and Grading (Miscellaneous Disturbed Area)	5.7	13.0	33.0
Subtotals	59.0	16.3	38.7
	TOTAL	114 acres	

Note:

(a) Includes approximately 5 acres of open water.

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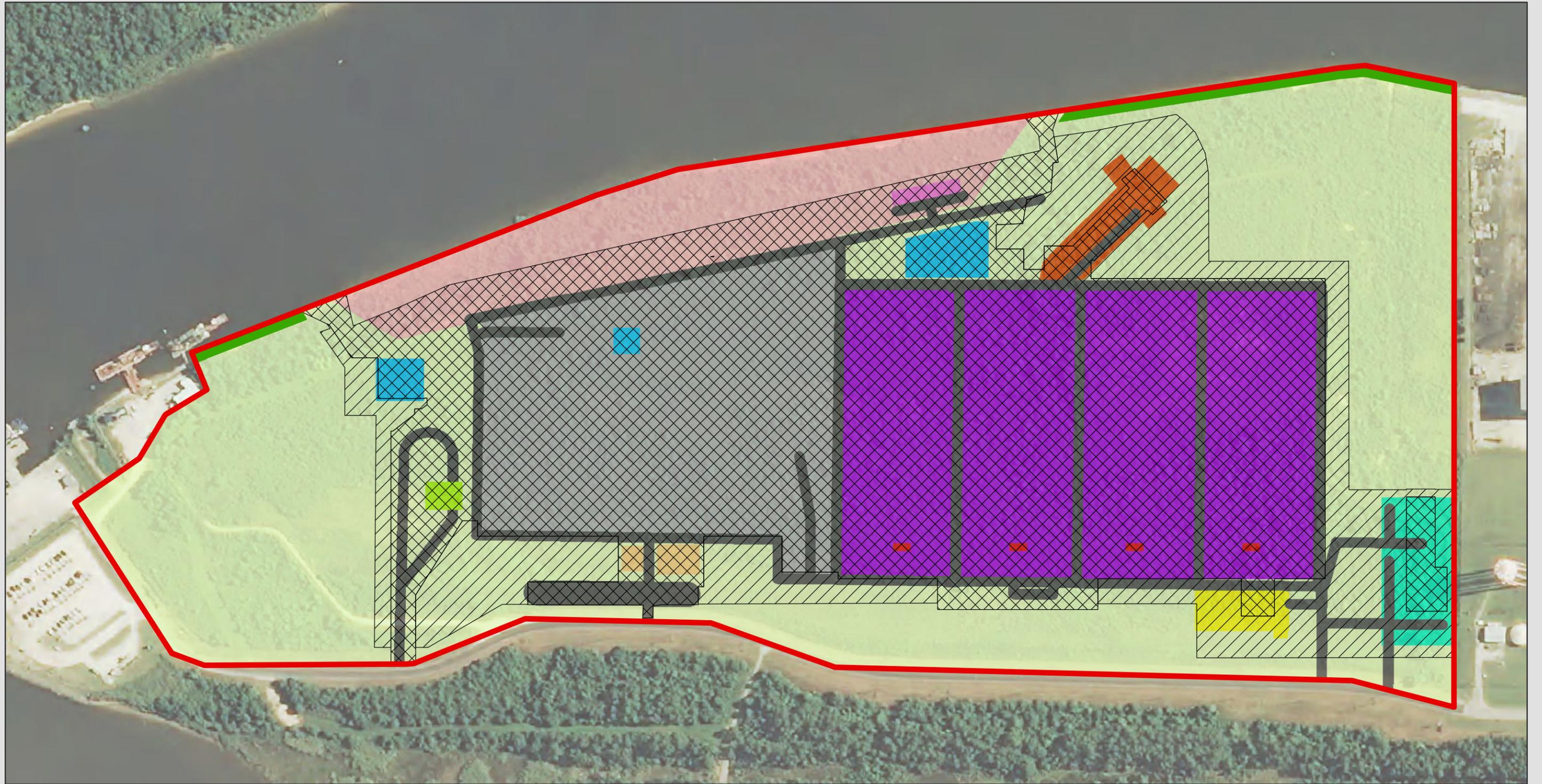
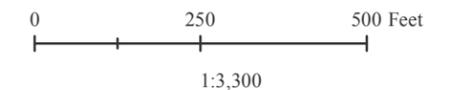


Figure 1.3-4
Land Requirements for Operation
of the Magnolia LNG Project

Magnolia LNG
 Calcasieu Parish, Louisiana

Legend

- | | | |
|--|--|--|
| Proposed LNG Facility Boundary | Gas Gate Station and Interconnect Pipeline | Miscellaneous Disturbed Area |
| Control, Administration and Workshop Buildings | LNG Storage Tank | Power, Water and Communications |
| Demineralized Water Treatment Plant | LNG Trains | Security, Support and Standby Tug Berthing |
| Facility Drainage and Containment | LNG Truck Loading | Internal Roads and Parking |
| Flare Stack | LNG Vessel Loading | Undisturbed Area |
| Impervious | Undisturbed Area | Semi-pervious |



Source- ESRI 2011, NAIP 2013
 Image Date- 08/27/2013
 Date: 4/23/2014

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1.4 PROCESS DESCRIPTION

For the process of liquefaction, Magnolia is proposing to use its highly efficient and patented OSMR[®] technology. The process is based on a simple single MR cycle, but the performance is significantly enhanced by the addition of conventional combined heat and power technology and conventional industrial ammonia refrigeration. These enhancements result in an efficiency improvement of at least 30 percent resulting in 30 percent less emissions.

As with all liquefaction technologies, the process of liquefaction involves removal of certain components, such as dust, acid gases, water, and heavy hydrocarbons, which could cause difficulty downstream at cryogenic temperatures. The natural gas is then condensed into a liquid at close to atmospheric pressure by cooling it to -260°F in a heat exchanger. Essentially, the liquefying of the treated feed gas is achieved by circulating a separate refrigeration circuit through the same heat exchanger. With the OSMR[®] liquefaction process, existing and proven technologies are used more innovatively to achieve better performance, and this section contains a more detailed description of the OSMR[®] LNG trains.

Magnolia proposes to use four OSMR[®] LNG trains each with a nominal capacity of 2.0 mtpa. Each LNG train would contain two independent parallel SMR circuits, each containing a 33-MW GE PGT25+G4 gas turbine driving a GE Nuovo Pignone model BCL805 single-stage centrifugal compressor.

Full and stable gas turbine power for these main refrigerant compressor drives would be achieved by using ammonia refrigeration to cool the inlet air into each turbine, thus increasing the output of the gas turbine. In addition to this, ammonia would be used to pre-cool the feed gas and the MR prior to entering the cold box. These features would combine to achieve an increase in plant capacity of 30 percent. This would enable the LP outlet MR stream from the cold box to return to the main compressor at a lower temperature, thereby significantly improving the compressor performance.

The effect of ammonia cooling on plant capacity and the fact that it would consume no additional fuel is substantial. Ammonia cooling would cause an increase in LNG plant capacity of around 30 percent without increasing the size of the major components of the liquefaction plant, namely the cold box, gas turbine, and MR compressor. These two simple enhancements of cooling gas turbine air and pre-cooling the MR would be major contributors towards the reduction in air emissions per unit of LNG produced. Minimizing air emissions was a key criterion in the design of the Project.

1.4.1 Gas Pre-Treatment Plant

The pre-treatment plant would comprise a gas sweetening plant and a dehydration plant which would remove components (principally CO₂, water, and any small amounts of BTEX) in the gas pipeline that would otherwise freeze solid or block the cold box exchangers at cryogenic temperatures.

Feed gas would enter at the Gas Gate Station at a controlled pressure and would pass via an inlet filter coalescer to separate any liquids prior to entering the Amine Unit. CO₂ in the gas would be removed using a proprietary amine solution in an absorber column. CO₂ would be removed to approximately 50 parts per million (ppm) in the contactor and the separated CO₂ would be vented to atmosphere. The water saturated gas then would be cooled to about 59°F (hydrate point is approximately 48°F) using the auxiliary refrigeration system and passed via a knock-out separator to remove bulk water from the gas and then routed through the molecular sieve bed dryers to remove most of the remaining water. Condensed water, along with trace amounts of amine, removed from the cooled gas stream would be recycled to the amine system as makeup water.

Gas with a water content of about 20 pounds per million standard cubic feet would enter the dehydration plant which would remove water down to less than 1 ppm. The dehydration plant would include three molecular sieve vessels. Two vessels would be in adsorption mode while the third vessel is being regenerated at full system pressure using a side stream of dry gas. Heating of regeneration gas would be provided by HP steam.

Wet regeneration gas exiting the dryer would be cooled to condense the water. The stream would be regulated to meet the required fuel gas pressure and the condensed water would be separated in a filter separator. This water would be returned to the amine sump as makeup water. The saturated gas stream would be heated to meet the required dew point before entering the gas turbines as HP fuel gas. No recycle compressor or fuel gas booster compressor would be required for regeneration gas since it would all be consumed as HP fuel gas. Any shortfall in fuel gas would be made up from the dry gas stream.

A mercury removal unit would be provided after the molecular sieve dust filters to ensure any mercury in the gas is removed prior to entering the liquefaction unit.

1.4.2 Liquefaction and Boil-Off Gas

The treated gas would be liquefied using an OSMR[®] plant comprised of a simple vapor compression cycle process. The MR would be comprised of nitrogen, methane, ethane, and n-butane.

Two separate independent parallel refrigeration circuits would be provided, each comprising a MR compressor, MR air cooler, CIK exchanger, and a main plate fin heat exchanger (cold box) and suction scrubber. The treated gas would split into two feed lines and enter each at a pressure of 100 pounds per square inch gauge (psig) at about -260 degrees Fahrenheit (°F) and would flow to the LNG storage tank. The refrigerant compressor would be driven by highly fuel-efficient low-emissions aero-derivative gas turbines. Fuel for the gas turbines would be provided by molecular sieve regeneration gas and by a small quantity of makeup feed gas. Prior to entering the cold box, the MR would be cooled in the CIK Exchanger using ammonia at a pressure of 44 psig and temperature of 30°F.

The MR for each cold box would be compressed to 600 psig by a single-stage centrifugal compressor directly driven by a gas turbine. The heat of compression would be removed by fin-

fan air coolers. The HP MR would then be partially condensed in the CIK using ammonia refrigerant. The HP MR would then be fully liquefied in the cold box and expanded (partially flashed), using Joule-Thomson effect, thus providing the refrigeration for the system. The LP MR would provide the refrigeration in the cold box and cool MR vapor would return to the compressor via the suction scrubber. The flashed vapor and BOG would be recovered from the LNG tank by two identical high-efficiency two-stage integrally geared BOG compressors. Only one compressor would operate during normal operation while the second unit would be started during LNG vessel loading. LNG would be sprayed into the vapor return line from the LNG vessel during loading to maintain constant vapor temperature entering the LNG storage tank and therefore constant suction (-238°F) and constant discharge (-76°F) temperature on the BOG compressors.

The BOG and flash vapor would be compressed to 100 pounds per square inch absolute (psia) and would return to the cold box where it would be substantially re-liquefied. The re-liquefied BOG would be separated and liquid methane would return to the LNG tank. A schematic of the OSMR[®] process is shown on Figure 1.4-1.

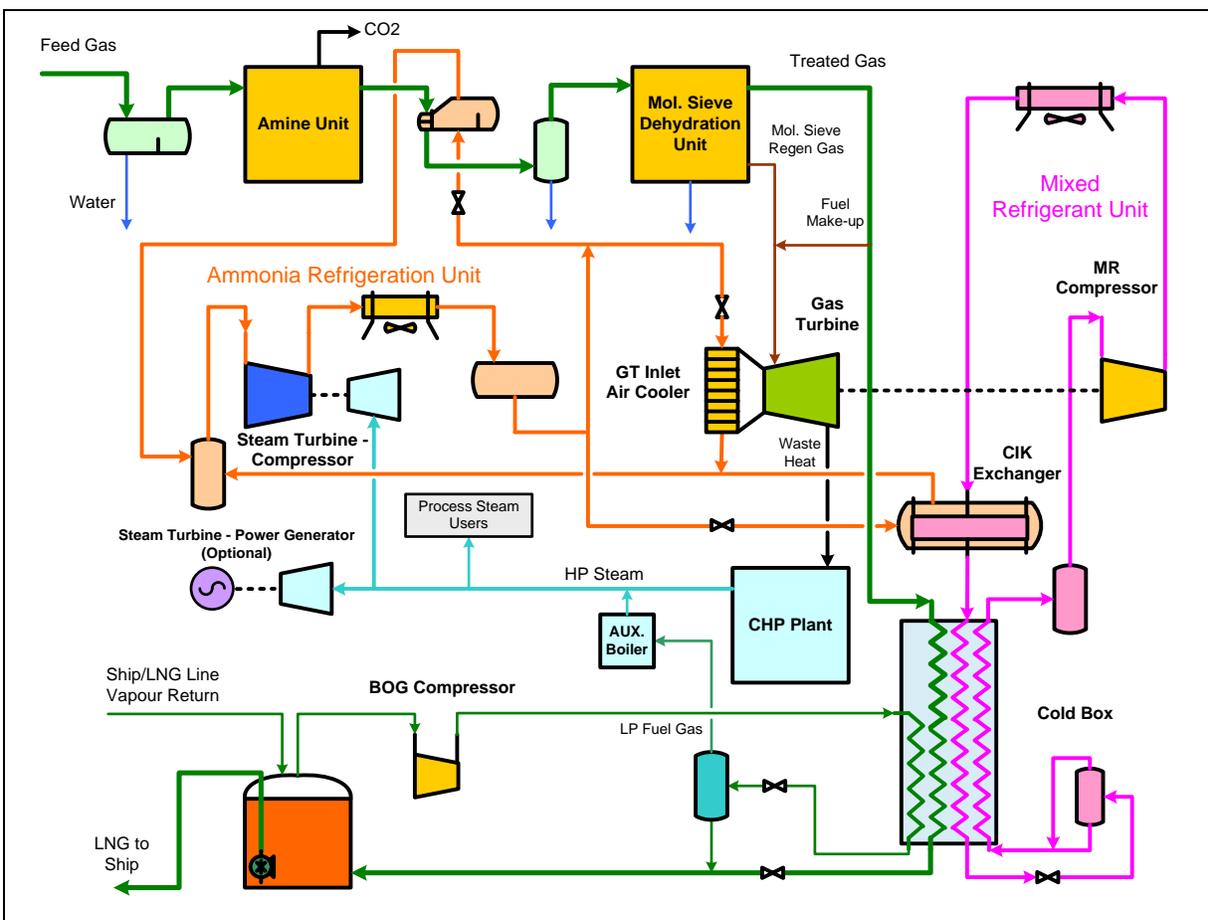


Figure 1.4-1 Process Schematic of OSMR[®] Process (1 MR Circuit Shown)

1.4.3 Refrigeration Circuits

Refrigeration to liquefy the feed gas would be provided principally by the SMR supplemented by ammonia refrigeration at the warm end of the cycle. The ammonia refrigeration plant would be powered by “free waste energy” generated by the CHP plant. The sizing of the ammonia refrigeration plant would be based on the spare power available from the CHP plant after all other heat users in the plant have been met. This ensures optimum use and balance of all available energy. The ammonia refrigerant would first be applied to cooling wet gas from the amine contactor then applied to cooling inlet air to the gas turbines to increase power, and the remainder would be used in pre-cooling the MR.

The ammonia refrigeration would use a conventional industrial refrigeration process comprised of steam turbine-driven centrifugal compressor, condensers, separator vessels, pumps, pipework, instrumentation, and control system (see RR 13, “Engineering and Design Material” for additional information).

1.4.4 Cold Box and Ammonia Pre-cooler

Each LNG train would comprise two parallel cold box/ammonia pre-cooler assemblies. Each assembly would comprise a conventional CIK exchanger mounted on a cold box, which encloses six parallel cores manifolded together with a common MR separator vessel. Only four streams are required within each cold box core so the configuration is very simple when compared to alternative LNG processes and typical ethylene processes. The differential temperatures between streams and resulting thermal stresses inside the cores would be within the limits required by the Aluminum Plate-Fin Heat Exchanger Manufacturers Association standards and would comply with the heat exchanger manufacturer’s requirements under all operating conditions. Start-up (including cool-down) and shutdown procedures and control systems would ensure that thermal stresses are kept within limits during steady-state and transient operating conditions including process upsets. The ammonia would cool the HP MR stream before it enters the cold box, thereby ensuring that low-temperature MR would return to the compressor suction, resulting in improved compressor performance.

1.4.5 Combined Heat and Power System

Proven CHP technology would be employed to recover the waste heat from the gas turbine so that all the process heat and steam power requirements for the plant are met, including all steam power for the ammonia refrigeration system. Steam would be generated via OTSGs which would generate HP steam to power a single pressure steam turbine generator, as well as supply the required quality of steam to various process heat users. OTSGs would be used to simplify the steam system design, again reducing the number of equipment items. No bypass stack or diverter damper would be required, so gas turbine(s) could continue to run and produce LNG even if the OTSG(s) were not operating.

Waste heat from the two gas turbines used in the MR refrigeration plants would be recovered to produce steam, which would be used in the CHP plant to provide plant heating and power. An auxiliary boiler fueled by lean flash gas produced from the BOG system also would

be used to supplement the steam production (refer to RR 13, “Engineering and Design Material” for complete details).

1.4.6 Reliability

Although the process would be highly integrated, which is necessary to achieve high efficiency, the overall plant availability would exceed 96 percent. This is mainly due to the fact that, if one gas turbine is down for maintenance, the plant would still run at half capacity. Also, if an ammonia compressor fails, the plant capacity would simply reduce slightly.

1.5 CONSTRUCTION SCHEDULE AND PROCEDURES

1.5.1 Schedule

Construction is projected to begin in mid-2015 (July 1, 2015) with proposed facilities placed into service by June 2018 as shown on the Project schedule in Appendix 1.D. If approved by the Commission, the construction timeline is expected to take approximately 36 months to the start-up of Train 1 of the proposed LNG facility (July 1, 2015 through June 30, 2018). It is estimated that there would be a three-month period between the commissioning of each successive train thereafter (June 1, 2018, through March 30, 2019). Thus, Train 4 would be commissioned nine months (March 30, 2019) following commissioning of Train 1. To summarize, the construction timeline is expected to take approximately 36 months to the start-up of Train 1 and an additional nine months for commissioning of the final trains.

1.5.2 Construction Laydown and Staging Areas

The requirement for laydown areas during construction is included within the approximately 115-acre Project site; the staging area within the DII facility would be located immediately to the east of the Project site. These areas are identified in Section 1.3, “Land Requirements.” Refer to Figures 1.3-1 through 1.3-3 for additional details.

1.5.3 Construction Employment

The construction of the Project would provide a stable source of income to the Louisiana and Gulf Coast communities. Louisiana in particular would benefit from the on-site construction, as the majority of the construction workforce would be sourced from the Project state. Furthermore, the state and local economies would benefit from the Project once the LNG facility is commissioned and fully operational. The expected operational life of the Project is 30 years minimum.

A summary of the on-site manpower projection during construction of the Project is presented below:

- **Direct Subcontractor Labor**
 - Peak Manpower = 443 Men @ peak months of Project
 - Average Manpower = 291 Men over lifespan of construction
 - Man hours = 1,546,100

- **Indirect Subcontractor Labor**
 - Peak = 68 Men @ peak months of Project
 - Average Manpower = 44 Men over lifespan of construction
 - Man hours = 309,220

- **Construction Management Labor**
 - Peak Manpower = 31 Men @ peak months of Project
 - Average Manpower = 20 Men over lifespan of construction
 - Man hours = 142,377

- **Total Project Labor**
 - Peak Manpower = 542 Men @ peak months of Project
 - Average Manpower = 355 Men over lifespan of construction
 - Man hours = 1,997,697

1.5.4 Construction Procedures

1.5.4.1 Site and Foundation Preparations

Onshore Site Preparation

Onshore Site preparation activities would include the following steps:

- Contractor would mobilize onto site from existing gravel road at the southwest corner of the property, from Henry Pugh Boulevard as shown on Figure 1.5-1.
- Contractor would conduct initial surveying of property lines, pipelines, and other property features, as deemed appropriate.
- Contractor would install appropriate erosion control measures along the property line and at existing primary property outfalls in accordance with site specifications for the Project.
- Starting from the southwestern property line (see area 1 on Figure 1.5-1), Contractor would begin site clearing in accordance with site specifications for the Project. The clearing stripping path is in the west-to-east direction in a north-south pattern as

shown by the arrows on Figure 1.5-1. Debris would be collected and disposed of off-site in compliance with local requirements.

- After the clearing operations, Contractor would begin stripping/grubbing of topsoil. Topsoil would be stockpiled on the west end of the property for reuse on-site, as needed. Grubbed material would be placed and disposed of with the clearing material.
- As the stripping/grubbing operations move in an easterly direction, survey crews would come in to set up the cut-and-fill grids on the property.
- Contractor would begin cut-and-fill operations after all stripping and survey work is complete.
- Contractor would begin cut, fill, and rough grading operations in the east-central (see area 2 on Figure 1.5-1) location of the property at the highest elevation, moving fill as directed by the cut-and-fill plan to lower areas, the most significant located in the northeast and southwest portions of the Project site, installing drainage swales, and establishing any additional erosion control measures that are deemed necessary, including their maintenance.
- In parallel with the cut-and-fill operations, Contractor would begin work on the property's westernmost road, truck-load out road, with the installation of the sub-base.
- In conjunction with the cut, fill, and site grading activities, Contractor would begin work on the heavy-haul road work.
- As cut, fill, and rough grading operations are complete, Contractor would continue with remaining plant roads, drainage system, parking lots, and temporary facilities planned.

Foundations Preparation

The tract of land where the Project is proposed to be located was previously used to deposit dredge material from excavation of the Industrial Canal and the turning basin.

A geotechnical investigation was undertaken and field work was completed during the month of September 2013 to determine the properties of the underlying soils at the proposed Project site (Fugro Consultants Inc. 2013). The outcome of this geotechnical investigation allowed evaluation of:

- suitable ground improvement techniques for the areas of the LNG storage tank and the LNG trains, if necessary;
- piling design options; and

- the best approach for excavating, dredging and constructing the LNG vessel loading facility.

The existing dredged spoil would ultimately need to be deposited off-site (refer to Section 1.5.4.2, “LNG Vessel Loading Facility Construction,” for additional information).

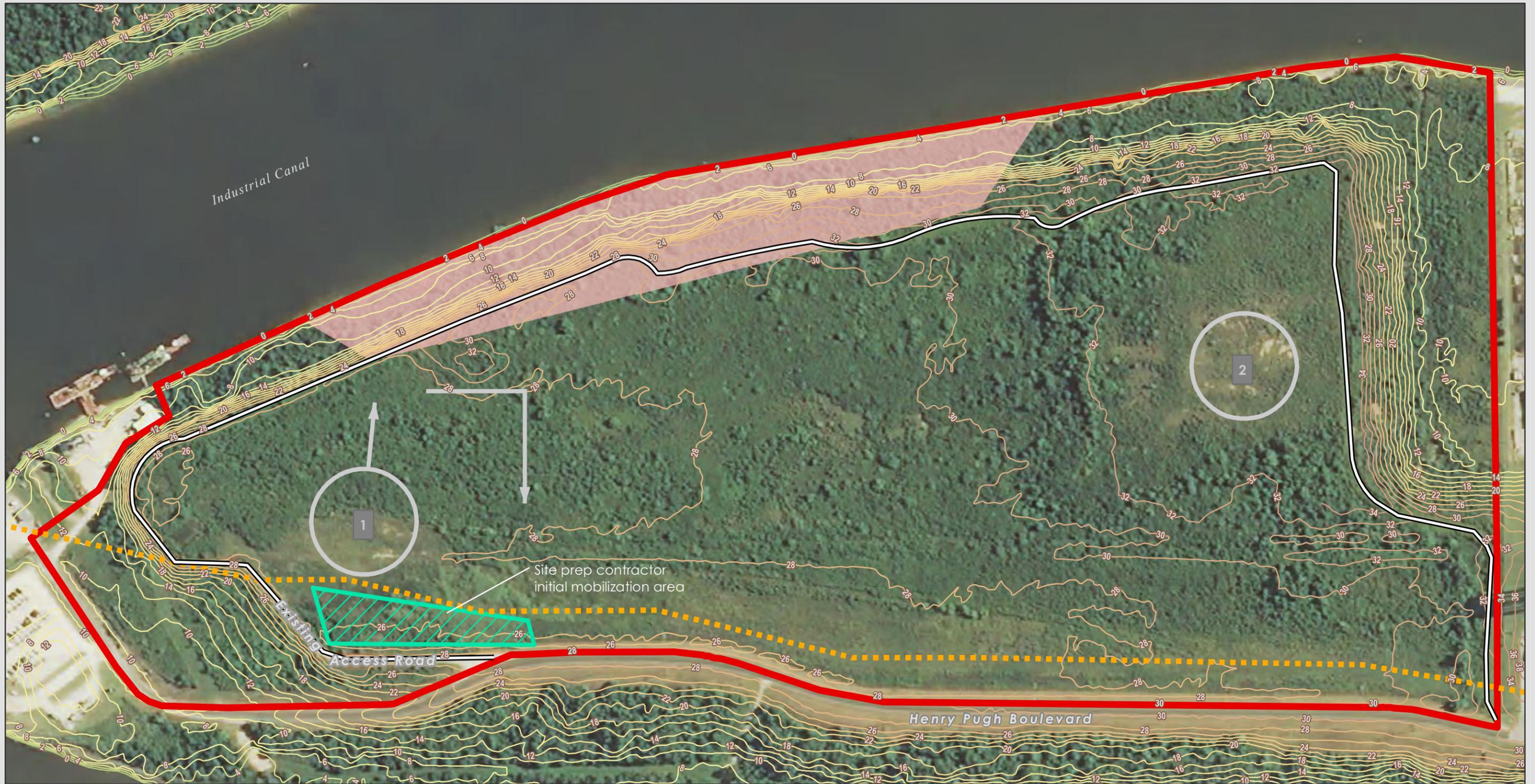
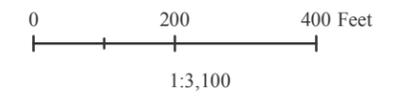


Figure 1.5-1
Site Preparation Mobilization and
Path of Construction Sequence

Magnolia LNG
 Calcasieu Parish, Louisiana

Legend

- Proposed LNG Facility Boundary
- 1 Site Clearing/Preparation in the Western Portion of Site
- 2 Site Clearing/Preparation in the East Central Portion of Site
- LNG Vessel Loading
- Existing Access Road
- Location "A"
- Existing Kinder Morgan Louisiana Pipeline
- Path Direction



Source- ESRI 2011, NAIP 2013
 Image Date- 08/27/2013
 Date: 4/23/2014

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1.5.4.2 LNG Vessel Loading Facility Construction

The LNG vessel loading facility would be recessed into the northern boundary of the site as shown on Figure 1.1-6. To create the recessed berthing and waterway access area, a combination of onshore excavation and dredging would be required at the site. The Project site would be graded to a standard elevation of 28 feet above North American Vertical Datum of 1988 (NAVD 88). The LNG trains would have a base elevation of 24 feet. The LNG tanks would have a base elevation of 17 feet above NAVD 88, but would have a secondary containment wall with a standard top elevation of 30 feet above NAVD 88.

Based on a proposed final grade elevation for the facility of 28 feet above NAVD 88, the Project would require the dredging of approximately 862,550 cubic yards of sediment and soil from a 16.20-acre area required for the recessed ship berthing on the south shore of the Industrial Canal (approximately 9.80 acres are existing uplands and 6.40 acres are existing water bottoms or submerged). Approximately 131,200 cubic yards of soils would be excavated from upland areas and placed on-site. The final volume of these soils has not been determined as this is dependent on final facility earthworks design. Upland soils would be excavated and relocated on-site using backhoes, front-end loaders, bulldozers, and similar equipment. The dredging would be accomplished by using a hydraulic cutterhead dredge with a pipeline directing spoil material to approved upland contained disposal sites.

Magnolia's current plans include hydraulically dredging 862,550 cubic yards of material from the recessed ship berthing and transporting this material by pipeline to an upland reclaimed borrow pit located approximately 8,000 feet east of the Project site, just east of the CB&I (formerly Chicago Bridge & Iron Company) modular fabrication facility located on Big Lake Road. The reclaimed upland soil borrow pit is 1,000 feet by 2,000 feet with an approximate depth ranging between 12 and 15 feet. It encompasses 46 acres of a 160-acre parcel of undeveloped land that is zoned for heavy industrial use and is currently used by CB&I for staging and laydown as shown on Figure 1.5-2. The dredged material from the Project would be beneficially used to reclaim the borrow pit to its original upland condition. The proposed reclamation site is located outside of the Louisiana Coastal Zone (LCZ), 3,200 feet east of the Industrial Canal. Magnolia's dredge-and-fill permit application to the USACE will include details about the disposal of dredge spoil.

Dredging would be accomplished by use of a hydraulic cutterhead suction dredge with spoil material routed through a pipeline to the approved spoil disposal location. The dredge would swing back and forth to slowly cut away the nearshore sediments and shoreline to establish the specified dimensions and depths of the recessed berthing area.

Suction dredging reduces impacts to water quality as compared to some other dredging methods because the excavated material is suctioned into a pipeline minimizing the loss of material and resuspension of sediments into the water column. To further minimize dispersion or sedimentation of the water column, the following measures would be implemented when required:

- Reduction of cutterhead rotation speed to reduce potential for side casting sediment away from the suction entrance and re-suspending sediment (typically effective on relatively loose, fine-grain sediment).
- Reduction of swing speed to ensure that the dredge head does not move through the cut faster than it can hydraulically pump the sediment, thus reducing resuspended sediment.
- Eliminating bank undercutting by removing the sediment in maximum lifts equal to 80 percent or less of the cutterhead diameter.

The selected contractor also may be required to periodically monitor suspended sediment concentrations during excavation to ensure suspended sediment concentrations do not exceed threshold standards established by the regulatory agencies during project permitting. If turbidity levels exceed these thresholds, then mitigation measures may be applied, such as turbidity control structures (e.g., turbidity curtains around immediate dredging area) or a temporary shutdown of dredging activities. The protocol for water quality monitoring and implementation thresholds and authorizations for mitigation measures will be outlined in the Dredge Material Management Plan to be developed prior to commencement of dredging operations.

Since cutterhead dredging is generally not associated with significant turbidity issues at the dredging site, turbidity modeling prior to Project commencement is not anticipated to be required.

Dredging approval would be obtained from the USACE and material would be disposed of in accordance with the permit conditions and in conjunction with the Port of Lake Charles and the USACE. The exact size and location of the recessed area is shown on Figure 1.1-6.

The LNG carrier and barge loading facility would be constructed using a combination of 2,005 feet of steel sheet pile bulkhead combined with appropriate rock armoring at the sheet pile base and along the east and west ends of the mooring basin. There would be four primary breasting dolphins, plus one center protective breasting dolphin with a bumper panel only (refer to Figure S200 and S301 of Appendix K in CEII Volume, RR 13) constructed by installing 96-inch-diameter steel pilings in the water adjacent to the terminal jetty/pier to support the fendering system and equipment required to moor LNG carriers and LNG barges. More engineering would have to be performed before the installation depth of the steel piles for the breasting and mooring dolphin structures can be finalized. Based on preliminary information, the tip of these piles may be installed to approximately 110 feet below the bed of the Industrial Canal in order to develop the load-carrying capacity that is anticipated for these structures. Six mooring points would be constructed onshore landward of the steel sheet pile bulkhead to provide additional mooring leads for the design range of LNG carriers and LNG barges.

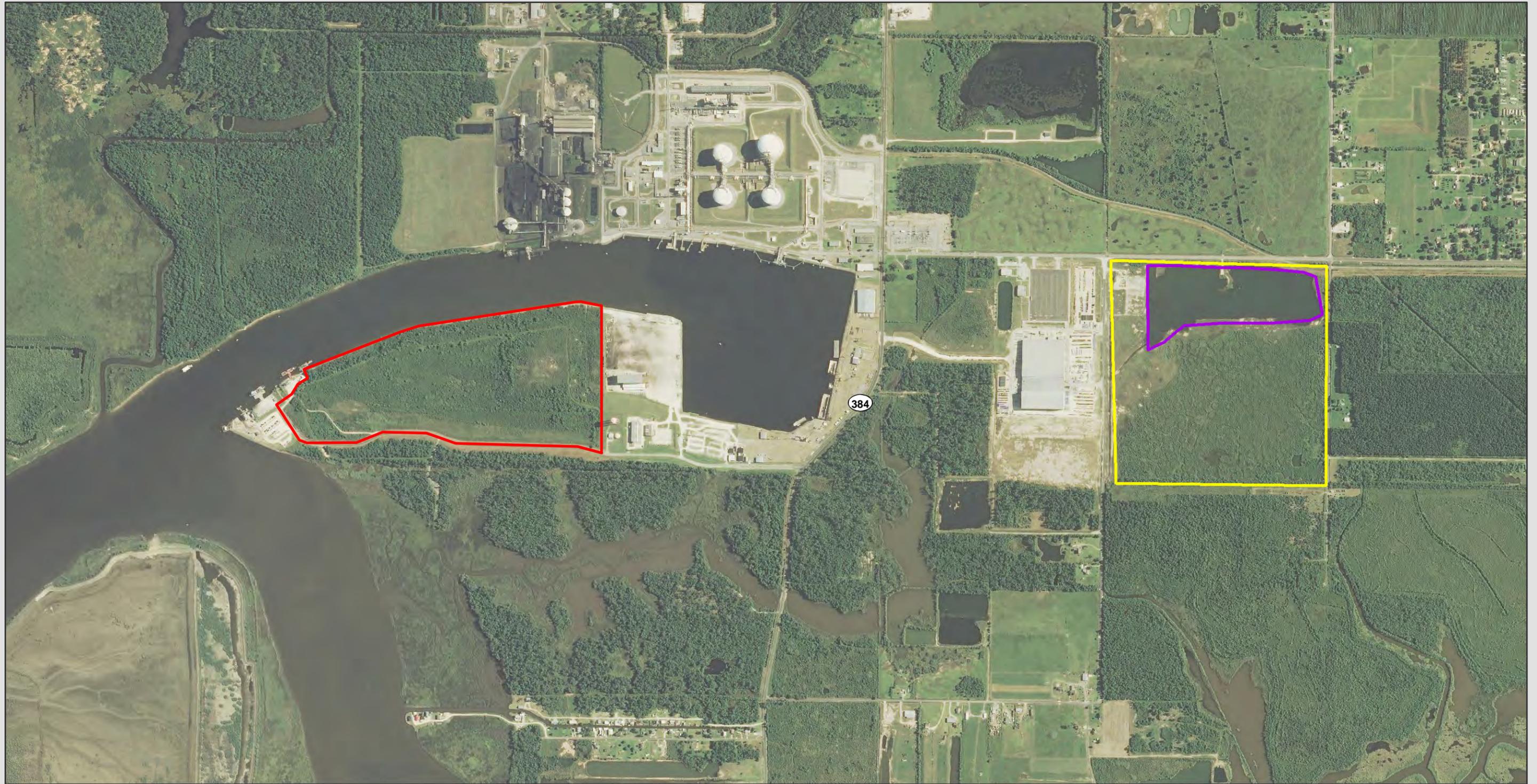
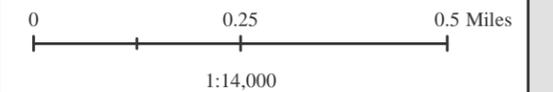


Figure 1.5-2
Chicago Bridge & Iron Company Pit
Site Boundary

Magnolia LNG
Calcasieu Parish, Louisiana

Legend

-  Proposed LNG Facility Boundary
-  Chicago Bridge & Iron Company Pit
-  Prairie Land Co Property



Source- ESRI 2011-2012, SONRIS 2014
Image Date- 08/27/2013
Date: 4/15/2014

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The LNG loading platform would be constructed of reinforced concrete with approximate overall dimensions of 128 feet long and 70 feet wide. A combination pipe and roadway trestle, approximately 26 feet wide and 128 feet long (located landward of the sheet pile bulkhead), would connect the LNG loading platform to the onshore liquefaction plant. The LNG loading platform would be supported by 24 concrete cylinder piles driven into the bed of the Industrial Canal and by the sheet pile bulkhead wall at the rear. The LNG loading platform would support three 16-inch LNG loading arms and one 16-inch vapor return arm for loading the LNG carriers, and one 8-inch LNG loading arm with a piggyback mounted 6-inch vapor return arm for loading LNG barges. More engineering would have to be performed before the installation depth of the concrete piles for the loading platform can be finalized. Based on preliminary information, the tip of these piles may be installed to approximately 110 feet below the bed of the Industrial Canal.

Additional equipment installed on the LNG loading platform would include three elevated firewater monitors towers, platform-level firewater monitors, a dry chemical system, a marine gangway, LNG process piping, and utilities. All marine structures would be connected by walkways extending east and west to the breasting dolphins. Figure 1.5-3 shows the steel sheet pile bulkhead, breasting dolphins, and the configuration of the Project's LNG loading platform.

The steel sheet bulkhead would be installed by use of vibratory hammer or a hydraulic pile driver. The five monopile steel breasting dolphin foundations also would be installed using a hydraulic pile driver. Likewise, the 24 cylindrical concrete pilings supporting the LNG loading platform would be installed using a hydraulic pile driver. The steel and concrete piling would be driven into the bed of the Industrial Canal to a depth to be confirmed by Project engineers. The rock armoring at the base of the steel sheet pile bulkhead, along the east and west ends of the marine basin and around the base of the LNG loading platform and breasting dolphin piles would be installed by crane or long-reach backhoe placement of the rocks into the water to provide protection to the bulkhead and shoreline from erosion caused by scour from the LNG carriers, or LNG barge tugs. The rock armoring would be delivered to the site by barge. Preliminarily, the anticipated shoreline protection at the base of the sheet pile wall around the basin would consist of an approximately 2-foot-thick $W_{50} = 30\#$ bedding stone layer with a 3-foot-thick armor stone that is $W_{50} = 600\#$. However, the exact details for shore-line protection including size, type, and quantity of rock armoring required will be developed during detailed engineering design and after the scour study has been completed.

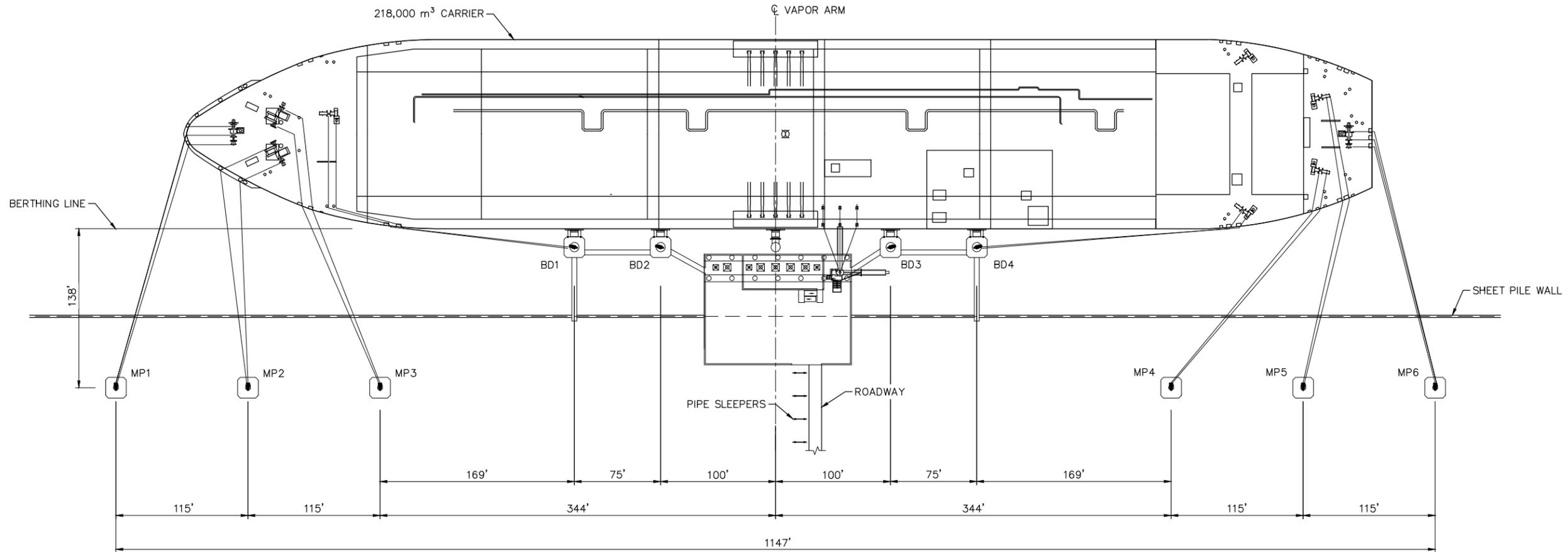
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TO CALCASIEU RIVER CHANNEL

INDUSTRIAL CANAL

TO TURNING BASIN



NOTES:

1. ALL DIMENSIONS SHOWN IN FEET.
2. BD# - BREASTING DOLPHIN
MP# - SHORE BASED MOORING POINT

B1 TYPICAL MOORING ARRANGEMENT FOR 218000m³ LNG CARRIER
S100 SCALE: 1"=50'



Figure 1.5-3 Typical Mooring Arrangement for 218,000-Cubic-Meter LNG Carrier

**PRELIMINARY
NOT FOR CONSTRUCTION**

**MAGNOLIA
LNG**

Mark	Issue For Information	Date	XX
A		8-26-13	

MAGNOLIA LNG
PRE-FEED MARINE FACILITIES
TYPICAL MOORING ARRANGEMENT
FOR 218,000m³ LNG CARRIER

Designed by:	Date:	Rev.
Dwn by:	8-26-13	
Reviewed by:	M&N Project No.:	
	DO	8166
	Drawn by:	
	RW	
	Drawing code:	
	S100	
	Drawing Scale:	SHOW
	Plot scale:	1:1 (D SHEET)

11011 RICHMOND AVENUE
SITE NO. 777042
HOUSTON, TX 77042
713-977-7372

moftatt & nichol

CH-IV International

SEAL

Sheet Reference No.
S100

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1.5.4.3 LNG Trains

The LNG trains would be designed, constructed, operated, and maintained in accordance with USDOT Federal Safety Standards for Liquefied Natural Gas Facilities, 49 CFR Part 193. The LNG trains would also meet the NFPA 59A LNG Standards. RR 11 includes information about reliability and safety of the Project.

After site preparation and prior to commencing construction of the Project, it would be necessary to construct access roads to the process areas (see Section 1.5.4.1, “Site and Foundations Preparations” for additional details).

As part of the evaluation process, two different methodologies were considered for the construction of the LNG trains: modular construction and stick-build construction. These two methodologies are described in more detail in the alternative analysis (RR 10). Based on the engineering analysis performed, modular construction would be used for the assembly of the LNG trains. For information regarding the shipment of equipment and materials to the Project site, refer to Section 1.5.4.9, “Materials and Equipment Delivery and Off-site Concrete Batch Plant.”

Each LNG train would be broken down into five main process modules. These modules would be fabricated off-site in a regional construction yard and then transported to the site via barge. The barges would deliver the LNG process modules and other equipment to the existing dock at the DII facility located immediately east of the Project site. Water access to the site would be via the Gulf Intracoastal Waterway, the Calcasieu River and the Industrial Canal. The barges would need to arrive in a certain sequence to allow efficient assembly of the LNG trains. Each LNG train would require a total of three barges to deliver the modules to the site as shown in Table 1.5-1.

Table 1.5-1 Barge Arrival Sequence per Train

Barge Arrival Sequence	Modules/Components on Barge
First Arrival	<ul style="list-style-type: none"> ▪ Module 5 ▪ Module 4
Second Arrival	<ul style="list-style-type: none"> ▪ Module 3 ▪ Module 2 ▪ LNG Tank Platform A ^(a)
Third Arrival	<ul style="list-style-type: none"> ▪ Module 1 ▪ LNG Tank Platform B ^(a) ▪ Fire System Skid ▪ BOG Compressor Skid ▪ Other skids

Note: (a) First train only.

The four LNG trains are expected to require 12 barge deliveries in all. It is possible that one or more LNG train modules could be constructed at the adjacent DII facility which could reduce the number of barge deliveries required to construct the LNG trains. The modules then

would be transferred from the barge and into final position using SPMTs. The SPMTs would wheel each process module sequentially into position and then lower each module onto piled supports. Smaller modules would be lifted into position by crane(s), as necessary.

1.5.4.4 LNG Storage

The LNG storage tanks would be site-erected using conventional full-containment construction techniques. A high-level summary of the construction activities is as follows:

- Preparation of site and installation of foundations. The proposed foundation arrangement for each LNG storage tank would include the use of 1,508 pre-stressed concrete piles of 2 feet by 2 feet in cross-section by 70 feet in length. The two LNG storage tanks would have a combined total of 3,016 piles. The piles would be driven by hydraulic hammer as is typical of these installations. The installation would occur over a multiple-month period (see schedule at Appendix 1.D) due to the number of pilings required (refer to RR 13, “Engineering and Design Material”) for the proposed arrangement and piling specifications and numbers.
- Construction of the tank base and post-tensioning of the outer concrete container wall.
- In parallel to the outer concrete container wall construction above, the steel dome roof and suspended deck would be constructed on temporary supports inside the outer container, to be later air-raised into position.
- Bottom carbon steel vapor liner to be installed.
- On top of the outer concrete container wall, the steel dome roof compression ring would be cast into the concrete then the steel dome roof would be air raised into position and secured to the compression ring.
- Installation of roof nozzles, penetrations, and studs plus steel reinforcement and concrete covering of the steel dome roof would be undertaken.
- Concurrent with the roof nozzles and penetrations, work would commence on the inner 9 percent Ni steel container, including the secondary bottom, bottom corner protection, inner container annular and bottom plates.
- Commence erection of the inner tank 9 percent Ni steel shell.
- Install internal accessories such as pump columns, bottom and top fill, instrument wells, and purge and cool-down piping.
- Install roof platforms, walkways, pipework and pipe supports.
- Hydrostatic test on the inner tank.

- Pneumatic test on the outer tank as per American Petroleum Institute (API) 620 procedures.
- Install process piping from tank top down to grade.
- After the hydrostatic test, the tank would be washed down and cleaned.
- Install resilient blanket on the outside of the inner tank shell.
- Install the required instrumentation inside the tank and annular space.
- Expand perlite insulation into the tank annular space using vibration methods.
- Install suspended deck blanket insulation.
- Install external piping insulation.
- Visual inspection.
- LNG pumps would then be installed; tanks would be purged with nitrogen to a positive gauge pressure.
- Purge and cool-down.

1.5.4.5 Pressure Testing of Pipe Sections and LNG Storage Tanks

Pipe sections would be either hydrostatically or pneumatically tested depending on the type and intended function of the pipe. Prior to being placed into service, the LNG piping would be tested to ensure structural integrity. The cryogenic piping would be pneumatically tested and the non-cryogenic piping would be hydrostatically tested. In general, cryogenic piping would be pneumatically tested with dry air or nitrogen at 1.1 times the design pressure, while non-cryogenic piping would be hydrostatically tested using water from the Calcasieu Parish District 12 Water Works at 1.5 times the design pressure. Testing would be in accordance with American Society of Mechanical Engineers (ASME) standards.

The inner 9 percent Ni stainless-steel container of the LNG storage tank would be hydrostatically tested using water from the nearby Calcasieu River Industrial Canal. It is anticipated that the hydrostatic test level of each tank would be conducted by filling each of the tanks to a height of 73.5 feet, thus requiring a volume of 3.49 million cubic feet (26.2 million gallons) of water for the testing of each LNG storage tank, each with an inside diameter of 246 feet. It is anticipated that hydrostatic testing of LNG storage tanks would be conducted one at a time, allowing the water from the first hydrostatic test to be reused for testing the second LNG storage tank (refer to RR 2, “Water Use and Quality,” for additional information).

After the hydrostatic test is completed for the last LNG storage tank, the water would be tested, treated (as necessary), pumped out of the tank, and discharged into Calcasieu River Industrial Canal in a location and manner to be determined and in accordance with applicable permits and regulations. Because water from the nearby Calcasieu River Industrial Canal would be used to perform the hydrostatic testing of the LNG storage tanks, the inside of the tank walls would be cleaned using a clean, clear power-wash to remove any silt particles that may adhere to the inner walls of the LNG storage tank. The power-wash would be conducted in accordance with vendor specifications. Typically, a small boat is installed in the tank's interior prior to the start-up of the test. The small boat would float up with the rising water level. When emptying of the tank is about to begin, an operator gets in the boat and power-washes the sides of the tank as the water level recedes. Magnolia does not anticipate the use of any biocides or additives to the hydrostatic test water.

1.5.4.6 Site Restoration

Magnolia has prepared preliminary drafts of the Project-specific Upland Erosion Control, Revegetation, and Maintenance Plan (Plan) and Wetland and Waterbody Construction and Mitigation Procedures (Procedures) based, respectively, on the FERC's Revised Upland Erosion Control, Revegetation, and Maintenance Plan and Wetland and Waterbody Construction and Mitigation Procedures, dated May 31, 2013. The Project-specific Plan and Procedures are provided in Appendix 2.C of RR 2, "Water Use and Quality."

Magnolia LNG's Project-specific Plan and Procedures call for appropriate erosion control and soil stabilization including post construction planting of grasses. Because the entire construction area (114 acres) would also be used during operations, no planting of native trees or similar activities to restore original site grades or vegetative communities is proposed. Following soil stabilization and grass planting, the Project site outside of the developed infrastructure would consist of grassy surfaces, such as a upland meadow where vegetation is maintained in a graminaceous or weedy state due to mowing activities. Once finalized, the Project-specific Plan and Procedures for site restoration would be submitted to the Commission for review and approval by the Director of the Office of Energy Projects.

1.5.4.7 Pipeline Interconnect

Feed gas would be transported to the site via an existing 42-inch interstate gas pipeline owned by KMLP that passes directly through the Project site. The KMLP pipeline crosses beneath the Project site and can be accessed without crossing outside the property boundary. The 42-inch KMLP pipeline traverses the southern portion of the site as shown on Figure 1.1-5. A tie-in would enable the pipeline to be connected to the Gas Gate Station within the Project site boundary, via an approximately 75-foot-long interconnect gas pipeline.

Once the tie-in procedure has been completed, KMLP would construct the interconnect pipeline and route the interconnect pipeline to the Gas Gate Station approximately 75 feet away. KMLP's system modifications to accommodate the Project will require a separate filing by KMLP with the FERC under Section 7(c) of the NGA (refer to Section 1.13, "Transportation of the Feed Gas to the Magnolia LNG Project"). On January 28, 2014, Magnolia executed a

binding Precedent Agreement with KMLP for firm natural gas transportation service up to 1,400,000 dekatherms per day (Dth/d), sufficient to satisfy the full 8 mtpa capacity of the Magnolia LNG Project. The Precedent Agreement served as Magnolia's binding bid in KMLP's recent open season for the Lake Charles Project, through which Magnolia was awarded its full 1,400,000 Dth/d bid.

The interconnect pipeline would be made of carbon steel pipe, manufactured in accordance with API and/or ASME specifications. Pipelines would be designed to comply with USDOT safety regulations contained in 49 CFR Part 192 and USDOT safety design regulations.

1.5.4.8 Construction Site Drainage

During construction, land is susceptible to erosion and sedimentation as a result of storm events and construction activities. Magnolia has prepared a draft site-specific construction SWPPP⁹, including best management practices (BMPs) to prevent mobilization of soil particles during construction and to capture those particles that do become mobilized and entrained in stormwater during rain events (see Appendix 2.E in RR 2). Magnolia would perform construction activities in accordance with the FERC's Plan and federal and state requirements and would implement BMPs including silt fencing, sediment barriers, and washdown areas to remove soil from vehicles before they exit the site.

During construction, stormwater runoff would be directed to designated, graded catchment areas within the site. The water would then drain into a catch basin which would overflow via a concrete overflow. The locations of these areas would be determined during FEED. The overflow would occur in a controlled manner and would drain into the Industrial Canal. Undisturbed areas of the site would retain their existing natural drainage.

1.5.4.9 Materials and Equipment Delivery and Off-site Concrete Batch Plant

Depending on size, weight, and origin of the material/equipment, equipment would be delivered either directly to the site via ground transportation utilizing local highway routes or by barge via the existing unloading dock, operated by DII, within the modular building yard immediately to the east of the Project site. An estimated 20 to 30 barge trips would be required to transport equipment to the site (LNG trains and LNG tank inner walls).

⁹ The LPDES is authorized under the USEPA's delegated NPDES program (which is authorized under the Clean Water Act) and promulgated through LAC Title 33:XI.2503. A water quality certification is required for all projects that obtain a coastal use permit or a Section 404/10 permit.

The LPDES Stormwater Permit Program is administered through LDEQ under LAC 33:IX.2511.B. For construction activities that disturb 5 acres of land or more, for applicable activities (clearing, grading, and excavation for construction activities), a Notice of Intent (Form NOI CSW-G) for LPDES Stormwater General Permit LAR100000 must be submitted to LDEQ detailing activities and discharges. The activities and discharges must be protective of threatened and endangered species, cultural resources, and TMDL limits on receiving waterbodies, and the requirements of the SWPPP must be met. Coordination with the LDWF and the Louisiana SHPO will be required to discharge stormwater from the proposed Project site. This coordination is typically conducted in coordination with the Section 404/10 permit and the WQC required under Section 10 of the Clean Water Act.

A preliminary estimate of approximately 5,000 pre-stressed concrete pilings would be required to create the foundations for the LNG storage tanks (3,016 pilings) and other process equipment foundations and structures. Pilings for the Project would be shipped via barge from one or more precast concrete pile vendors. One local vendor stated that 150 precast concrete pilings could be loaded on each barge and four barges could be pushed by a single tug on each delivery voyage. As such, concrete piling deliveries would require about nine additional marine deliveries consisting of a tug boat with four barges in the tow.

Additional marine deliveries would be required for steel sheet pile for the mooring basin, pilings for the LNG loading platform, pilings for the mooring dolphins, specialized marine mooring equipment, and the rock armoring to protect the base of the steel sheet pile seawall and mooring equipment. An additional six to eight marine deliveries (tug and barge combinations) could be required for these marine components and materials. Five additional tug and barge combination deliveries are anticipated for miscellaneous components and construction materials. In total, Magnolia estimates 50 or fewer marine deliveries during construction of the Project.

The volume of concrete required for the Project would be provided by an off-site existing concrete batch plant located within a 3- to 5-mile radius of the site. Concrete would be delivered by road in concrete trucks. Currently, Magnolia is in conversations with several concrete batch plant providers in the vicinity of the Project site. Among possible suppliers of concrete for the Project is the Dunham Price concrete batch facility located on West Lincoln Road, near the Lakes Charles airport, about 5 miles east of the Project site. Dunham Price is considered the largest supplier of aggregates and concrete in Southwest Louisiana. Estimates of the Project's roadway construction traffic are discussed in RR 5, "Socioeconomics."

1.6 OPERATIONS AND MAINTENANCE

All Project operations and maintenance (O&M) personnel would be trained to properly and safely perform their assigned duties and responsibilities. Operators would be trained in the handling of potential hazards associated with LNG, cryogenic operations, and the proper operations of all the equipment. The operators would meet all the training requirements of the USCG, the USDOT, the Louisiana State Fire Marshall, and other regulatory entities, as well as the requirements of the Project.

Magnolia would develop and implement an Operations Execution Plan (OEP) that describes the operational approach and activities through engineering, procurement, construction, commissioning, start-up and into the operational phase of the Project.

The main objectives of the OEP are:

- to align operations and management, in order to achieve the Project objectives;
- to ensure focus on start-up and initial operation; and
- to provide a list of activities that require addressing during design through to commissioning.

The OEP would describe the activities required to achieve “right-first-time” approach for the life of the Project.

The Project’s full-time maintenance staff would conduct routine maintenance and minor overhauls. Major overhauls and other major maintenance would be handled by bringing in maintenance contractors’ personnel specifically trained to perform the required services. All scheduled and unscheduled maintenance would be entered into a computerized maintenance management system.

Personnel requirements must enable a high level of safety for both production and maintenance, and would include positions such as:

- Plant Manager
- Marine Operations Manager
- Operations Manager
- Maintenance Manager
- Shift Supervisors
- Field Operators
- Control Room Operators
- Instrument/Electrical/Mechanical Technicians
- Health, Safety and Environment Manager
- Tug crews and Dock crews
- Materials Coordinator
- CMMS Scheduler
- Plus others

There are estimated to be 67 Magnolia site personnel once the facility is operating at full LNG capacity of 8 mtpa. As an extension to the core operations and maintenance team of 67 site personnel, specialty third-party contractors would be contracted periodically to assist with maritime operations and scheduled preventative maintenance of the facility. Furthermore, due to the nature of shift work and periodic LNG vessel/trucking operations, approximately 45 site personnel are expected to be on-site during the day hours. During night hours, this would be reduced further when some of the administration, maintenance, and other site personnel depart the site. Appendix A.1 in Resource Report 13, “Engineering and Design Material,” contains an organizational chart for the operations and maintenance phase.

1.7 SAFETY

The Project facilities would be designed, constructed, operated, and maintained in strict accordance with PHMSA Federal Safety Standards for Liquefied Natural Gas Facilities, 49 CFR Part 193. In addition, the Project would be designed to meet all USCG standards in 33 CFR Part 127, Waterfront Facilities Handling Liquefied Natural Gas and Liquefied Hazardous Gas. The facilities would also meet the NFPA 59A LNG Standards. Safety controls and the role they play are addressed in more detail in RR 11, “Reliability and Safety.”

1.7.1 Spill Containment

The LNG and MR spill containment systems for the Project would be designed and constructed to comply with USDOT - Federal Safety Standards for Liquefied Natural Gas Facilities (49 CFR Part 193); USCG - Waterfront Facilities Handling Liquefied Natural Gas and Liquefied Hazardous Gas (33 CFR Part 127); Standard for the Production, Storage, and Handling of Liquefied Natural Gas (NFPA 59A- Applicable versions of this standard are incorporated in 49 CFR 193 (per § 193.2013); and all other applicable federal and state regulations. These regulations require that each LNG container and each LNG transfer system be provided with a means of secondary containment sized to hold the quantity of LNG that could be released as a result of the design spill appropriate for the area and LNG equipment.

The regulations also require transfer and storage areas for flammable refrigerants and flammable liquids be graded, drained, or provided with impoundment in a manner that minimizes the possibility of accidental spills and leaks that could endanger important structures, equipment, or adjoining property or that could reach waterways.

1.7.2 Thermal Exclusion and Vapor Dispersion Zones

The LNG storage tanks proposed for the Project must comply with the USDOT's siting requirements at 49 CFR Part 193, subpart B which incorporates the 2001 edition of the NFPA 59A. As specified in 49 CFR Part 193.2057, thermal radiation protection requires that each LNG container and LNG transfer system have thermal exclusion zones based on three radiation flux levels in accordance with Section 2.2.3.2 of NFPA 59A.

The thermal exclusion zones are designed to protect people and property in the event of an accident and fire at a LNG facility. For the proposed Project, exclusion zone distances for various heat flux levels associated with the LNG storage tanks were calculated according to 49 CFR 193.2057 and section 2.2.3.2 of NFPA 59A, using the "LNGFIRE III" computer program model developed by the Gas Research Institute. Thermal radiation distances were determined for 1,600, 3,000, and 10,000 British thermal units per square foot per hour (Btu/ft²-hr) incident heat flux levels for a fire from the full impoundment area surrounding the two proposed LNG storage tanks. The 1,600 Btu/ft²-hr heat flux level is associated with an exposed person experiencing burns within about 30 seconds. At 3,000 Btu/ft²-hr, an exposed person would experience burns within 10 seconds; however, a wooden structure would not be expected to burn in that time and would afford protection to sheltered persons. At 10,000 Btu/ft²-hr, clothing and wood can ignite spontaneously. These thermal exclusion zone distances and the corresponding land use restrictions are shown in Table 1.7-1.

The thermal exclusion zone calculations were based on the finalized LNG storage tank dimensions detailed in RR 13. As the engineering design for the Project is still progressing and detailed weather analysis has not yet been performed, the final exclusion zone calculations may vary slightly. However, it is believed that, based on the current stage in the engineering design, these distances would not vary by more than 5 percent.

Table 1.7-1 Preliminary Magnolia LNG Thermal Exclusion Zones

Source	Exclusion Area NFPA 59A Section 2-2.3.2(a)	Incident Flux (Btu/ft ² -hr)	Exclusion Zone (feet)
LNG storage tank impoundment	Outdoor assembly area occupied by 50 or more people.	1,600	951
LNG storage tank impoundment	Off-site structures used for occupancies or residences.	3,000	744
LNG storage tank impoundment	Property line that can be built upon.	10,000	403

Source: Daughdrill 2013.

Magnolia plotted the NFPA 59A thermal exclusion zones for the proposed Project on a geo-referenced map that also contained the Project site boundaries and the 2012 LCZ boundary. This information is included and discussed in detail in RR8, “Land Use Recreation and Aesthetics.”

Vapor dispersion exclusion zones would be calculated for the proposed Project facilities as required by 49 CFR Part 193.2057 and 193.2059 using the models approved by PHMSA.

For additional information about thermal exclusion and vapor dispersion calculations, please refer to RR 11, “Reliability and Safety.”

1.7.3 Hazard Detection System

Hazard detectors for the Project would be installed throughout the facilities to give operations personnel a means for early detection and location of released flammable gases and fires. The hazard detection system would be designed in accordance with NFPA requirements and other applicable standards. The hazard detection systems would consist of the following:

- combustible gas
- fire and flame
- leak detection system
- high temperature
- low temperature
- smoke detectors
- toxic detectors

The hazard detection systems would be hard-wired to the main control system for alarm. Area gas detectors would be provided to monitor flammable gases. Low temperature sensors would be located at the spill impoundment basin to shut down and/or prevent the stormwater pumps from starting in the event of an LNG spill. Ultraviolet/infrared fire and flame detectors also would be located throughout the LNG terminal, and high temperature detectors would be located to detect a fire on the vent pipes of the LNG storage tank relief valves. The toxic

detectors would detect ammonia, CO₂, and hydrogen sulfide and would be calibrated appropriately depending where in the plant they are located and what material they are calibrated to detect (refer to RR 11 for additional information).

1.7.4 Hazard Control System

Several different types of fire suppression agents would be available for fighting fires within the Project facilities. The type of agent that would be used in a specific situation would depend on the characteristics of a particular event and on the relative effectiveness of the various agents for that particular type of fire. Hazard control systems would consist of the following:

- firewater system
- high expansion foam system
- sprinkler, water spray, and deluge systems
- portable and wheeled fire extinguishers
- fail safe shutdown system
- security system

1.7.5 Firewater System

The Project would include firewater supply and distribution systems for extinguishing fires, cooling structures and equipment exposed to thermal radiation, and dispersing flammable vapors. Additionally, hydrants, hose reel, and fixed monitors would be strategically located for the Project (see RR 11, “Reliability and Safety”).

The firewater system would be designed in accordance with NFPA requirements. The proposed source of water supply for the firewater system would be from on-site aboveground tanks. The tanks would be filled using groundwater from the groundwater wells. The deluge system for the LNG storage tanks would access water from the Industrial Canal surface water by using pumps. Refer to Section 2.2.4, “Water Use,” for additional information on the LNG tanks deluge system.

Refer to Section 1.1.12.2, “Water Supply and Sewage Handling,” for water supply requirement information. Refer to RR 11, “Reliability and Safety,” for additional details on the firewater system.

1.7.6 High-Expansion Foam System

High-expansion foam concentrate would be metered or proportioned into the firewater system by means of a typical balanced pressure foam proportioning system. The resulting foam solution would be delivered via underground piping to the high-expansion foam generator installed in the LNG spill impoundment sump. The high-expansion foam generator, Angus or equivalent, would be water-motor powered, thus, no electrical power would be required. The foam generator would produce nominal 500:1 high-expansion foam, i.e., 500 parts air for every part foam solution. This foam would be applied to LNG spills, whether ignited or un-ignited. Applied to ignited spills, the foam would control the fire, greatly reducing the level of radiant

heat to the surroundings. The high-expansion foam systems would be designed in accordance with NFPA 11A.

1.7.7 Fail Safe Shutdown System

The Project facilities would have an ESD system with shutdown and control devices designed to leave the facilities in a safe state. The ESD system would be used for major incidents and would result in either total plant shutdown, shutdown of processes, and/or individual pieces of equipment, depending on the type of incident.

1.7.8 Security

The LNG facility would be subject to facility security regulations under the USCG Maritime Transportation Security Act (33 CFR Part 105) and would have a facility security plan approved by the USCG. The LNG facility would meet all necessary security measures required under those regulations including security fencing, lighting, access control, and CCTV. In addition, PHMSA regulations concerning transportation of hazardous materials would be evaluated and any applicable PHMSA security requirements not otherwise covered by the USCG-approved Facility Security Plan would be implemented.

The Project facilities would include sirens that would be audible in all locations per USCG LNG facility regulations (33 CFR 127). The sirens would have a distinctive tone for easy recognition between alarms and emergency events.

Plant security would include a perimeter fence consistent with established Port protocol. Access through the plant gate and buildings would be consistent with the requirements of the USCG-approved Facility Security Plan. CCTV cameras would permit viewing of the entrance area and other locations around and within the plant including tank top and LNG vessel loading platform. Guard houses would be strategically located at certain locations along Henry Pugh Boulevard to monitor activities.

1.8 FUTURE PLANS AND ABANDONMENT

At this time, Magnolia has no future plans which would result in the expansion of the currently proposed Project facilities. If an expansion is ever envisioned in the future, Magnolia would seek the appropriate authorization from federal, state, and local agencies. Magnolia envisions a 30-year life for the Project. However, the facilities themselves would, with proper maintenance, be capable of being operated for 50 years or more. Regardless of the duration of utilization of the proposed Project facilities, Magnolia would obtain the necessary permission to abandon its facilities in accordance with regulations that exist at the time of abandonment and any landowner requirements.

1.9 CUMULATIVE IMPACT ANALYSIS

Cumulative impacts are the collective result of the incremental impacts of an action that, when added to the impacts of other past, present, and reasonably foreseeable future actions,

would affect the same resources, regardless of what agency or person undertakes those actions (40 CFR 1508.7). Cumulative impacts can result from actions that have individually minor impacts but that collectively impose significant impacts over a period of time. Compliance with the National Environmental Policy Act (NEPA) requires an analysis of cumulative impacts (40 CFR 1508.25(a)(2) and 40 CFR 1508.25(c)(3)). The FERC considers a reasonably foreseeable action to be a future action that has a realistic expectation of occurring. These include (but are not limited to) actions under analysis by a regulatory agency, proposals being considered by state or local planners, plans that have begun implementation, or future actions that have been funded.

For this cumulative effects analysis, reasonably foreseeable future development was considered in the context of specific proposals as well as general trends in the region. Past actions were considered in the baseline evaluation of impacts. To identify specific proposals that might impose cumulative environmental effects in the region, Magnolia sought information on specific projects, developments, or activities with potential impacts that would overlap in timeframe or geographically with those of the proposed Project.

Magnolia identified projects by contacting regulatory and planning boards and through publicly available information. The projects were screened for review using a standard of 1) having submitted a site plan for review by a local planning agency or government agency, 2) an application submitted to a regulatory agency for permit review, 3) available press releases, and 4) within approximately 50 miles of the Project. In many cases, the limited availability of detailed information about future projects, actions, or facilities requires qualitative assessments of potential cumulative impacts. Evaluating the potential cumulative impacts of in-progress and proposed projects creates an unavoidable level of uncertainty. Projects can be delayed, abandoned, or altered between the time they are announced and the time they are completed or abandoned.

The timeframes for each reasonably foreseeable future development project were further defined as proposed, in permitting, and under construction. For each proposed project, Magnolia attempted to verify information about the project or its impacts, otherwise it was not evaluated further. In addition, Magnolia's resource experts identified expected environmental effects of reasonably foreseeable future development projects based on publically available information or using professional judgment and experience with similar projects. Table 1.9-1 identifies the locations, timeframes, general scope, and expected environmental effects of each reasonably foreseeable future development project. The projects are organized in the following general categories: industrial, commercial, and residential developments. Figure 1.9-1 shows the locations of the projects.

The timeframe for the Magnolia LNG Project, as described in Section 1.5.1, "Schedule" (also see Appendix 1.D), calls for construction to begin in mid-2015 with operation by June 2018 for Train 1 and operation of all four trains in early 2019. As a result of the preliminary review of the timeframe for each project in Table 1.9-1, a number of projects were not evaluated further: projects completed (considered part of the baseline), projects that would not overlap in time with the Magnolia LNG Project, and projects proposed or with an unknown timeframe.

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
Industrial – Gas/Chemical/Gas-to-Liquids (GTL)						
1	Sabine Pass LNG Export Terminal (Cheniere Energy, Inc.)	Cameron Parish	41.9	Under Construction as of 2013; Operation estimated 2015/2016 for trains 1 and 2 and 2016/2017 for trains 3 and 4 Permitting was initiated for trains 5 and 6 in early 2013.	<ul style="list-style-type: none"> ▪ Six new liquefaction trains, each with nominal capacity of approximately 4.5 million tons per annum (mtpa) (approximately 0.5 bcf/day each). ▪ 3,000 construction jobs, 77 retained jobs, 356 new permanent direct jobs (206 new/150 resident contractors), 589 new permanent indirect jobs, \$100,000 avg. salary. ▪ \$11 billion capital investment. ▪ Cheniere Creole Trail Pipeline, L.P. (CCTPL) would add approximately 98.7 miles of pipeline, including two loops (Loop 1 and Loop 2), an extension, three laterals, and a new compressor station. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://www.cheniere.com/lng_industry/sabine_pass_liquefaction.shtml. ▪ http://energy.gov/sites/prod/files/2013/07/f2/Summary_of_Export_Applications.pdf. ▪ http://www.ferc.gov/whats-new/comm-meet/2013/022113/C-7.pdf. ▪ http://www.cheniere.com/CQP_documents/Landowner_Letter.pdf. 	<ul style="list-style-type: none"> ▪ New and maintenance dredging ▪ New ballast water ▪ Additional marine traffic ▪ Groundwater use during construction; municipal water during operations ▪ Additional security vessels that temporarily prohibit recreational use ▪ Major air emission source ▪ Noise during construction ▪ Addition of new large LNG storage tanks ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
2	Lake Charles Export, LLC (Trunkline LNG Company, LLC)	Lake Charles, Calcasieu Parish	0.5	In Permitting. Construction expected to begin 2015; Operation to begin in 2019.	<ul style="list-style-type: none"> ▪ Natural gas liquefaction project with a capacity of approximately 15 million tons per annum (mtpa) (approximately 2 bcf/day each). ▪ Several thousand construction jobs, 100 new operation phase jobs. 	<ul style="list-style-type: none"> ▪ New and maintenance dredging ▪ New ballast water in the Industrial Canal ▪ Additional marine traffic ▪ Groundwater use during construction;

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					<ul style="list-style-type: none"> ▪ \$5.7 billion capital investment. As part of the project, Trunkline LNG’s interstate natural gas pipeline would be extended approximately 0.5 mile to provide feed gas to the liquefaction facility. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://www.panhandleenergy.com/lakeCharles/lc_regulatory.asp ▪ http://energy.gov/sites/prod/files/2013/07/f2/Summary_of_Export_Applications.pdf ▪ http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=14197485 	<ul style="list-style-type: none"> ▪ municipal water during operations ▪ Additional security vessels that temporarily prohibit recreational use ▪ Major air emission source ▪ Noise during construction ▪ Addition of new large LNG storage tanks ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
3	Cameron LNG, LLC	Hackberry, LA, Lake Charles Harbor and Terminal District property, Cameron Parish	4.9	In Permitting. Construction planned 2014; operation in 2017.	<ul style="list-style-type: none"> ▪ Three liquefaction trains with a nameplate of 4.5 MTPA of capacity each, 13.5 MTPA total. In addition, a new 21-mile natural gas pipeline, a compressor station, and proposed modifications to existing pipeline interconnection. ▪ 130 new jobs/60 retained, 610 indirect jobs/3,100 construction jobs, \$80,000 average salary and benefits. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://cameron.sempralng.com/liquefaction.html ▪ http://energy.gov/sites/prod/files/2013/07/f2/Summary_of_Export_Applications.pdf 	<ul style="list-style-type: none"> ▪ New and maintenance dredging ▪ New ballast water ▪ Additional marine traffic ▪ Groundwater use during construction; municipal water during operations ▪ Additional security vessels that temporarily prohibit recreational use ▪ Major air emission source ▪ Noise during construction ▪ Addition of new large LNG storage tanks ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
4	Golden Pass LNG	Sabine Pass, Texas		In Permitting Expected operation in 2019	<ul style="list-style-type: none"> ▪ Expansion of existing facility for export of 15.6 million tons of LNG per year (approximately 2 bcf/day). The new facility would be built on existing Golden Pass 	<ul style="list-style-type: none"> • New and maintenance dredging • New ballast water in the Industrial Canal

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					<p>property and utilize the existing state-of-the-art tanks, berths and pipeline infrastructure. New facilities for natural gas pre-treatment and liquefaction would be constructed.</p> <ul style="list-style-type: none"> ▪ Pipeline upgrades will include installation of approximately 8 miles of 30- to 36-inch pipeline and installation of additional compressor stations. <p>Source:</p> <ul style="list-style-type: none"> ▪ http://goldenpassproducts.com/index.cfm/page/8 	<ul style="list-style-type: none"> • Additional marine traffic • Groundwater use during construction; municipal water during operations • Additional security vessels that temporarily prohibit recreational use on the Sabine River • Major air emission source • Noise during construction • Addition of new large LNG storage tanks • Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
5	Waller Point LNG (Waller Energy Holdings, LLC and Waller LNG Services, LLC)	Entrance of the Calcasieu Ship Channel, Cameron Parish	22.0	Proposed	<ul style="list-style-type: none"> ▪ Plan to export domestically produced LNG of approximately 1.3 mtpa (approximately 0.2 bcf/day) up to the equivalent of 58.4 Bcf of natural gas per year to Free Trade Agreement (FTA) countries using a proprietary floating storage tank (NO92 Membrane) at the facility. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://www.marinelink.com/news/terminal-facility-develop349173.aspx ▪ http://marinelog.com/index.php?option=com_content&view=article&id=3196:waller-marine-to-develop-small-scale-lng-terminals&catid=1:latest-news&Itemid=195 ▪ http://www.fossil.energy.gov/programs/gas/regulation/authorizations/2012_application 	<ul style="list-style-type: none"> ▪ New and maintenance dredging ▪ New ballast water ▪ Additional marine traffic ▪ Groundwater use during construction; municipal water during operations ▪ Additional security vessels that temporarily prohibit recreational use ▪ Potentially major air emission source ▪ Noise during construction ▪ Addition of new large LNG storage tanks ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					s/Waller LNG Services, LLC 12-152-LNG .html <ul style="list-style-type: none"> http://www.fossil.energy.gov/programs/gasregulation/authorizations/2013_application_s/13_153_LNG.pdf 	
6	Gasfin Development USA, LLC	Along the Calcasieu River, Cameron Parish	20.8	Proposed	<ul style="list-style-type: none"> Received long-term authorization from DOE to export to FTA countries approximately 1.5 mtpa (approximately 0.2 bcf/day) up to 74 Bcf per year of natural gas domestically produced LNG from a proposed mid-scale natural gas liquefaction and LNG export terminal. <p>Sources:</p> <ul style="list-style-type: none"> http://www.gasfin.net/ http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=2&ved=0CC4QFjAB&url=http%3A%2F%2Fwww.fossil.energy.gov%2Fprograms%2Fgasregulation%2Fauthorizations%2FOrders_Issued_2013%2Ford3253.pdf&ei=PmcvUv-DPKnkyQGd64GwBg&usq=AFQjCNGIOtGSUY0hU_bGCaGk38wJVn5hFw&bvm=bv.51773540,d.aWc 	<ul style="list-style-type: none"> New and maintenance dredging New ballast water Additional marine traffic Groundwater use during construction; municipal water during operations Additional security vessels that temporarily prohibit recreational use Potentially major air emission source Noise during construction Addition of new large LNG storage tanks
7	Venture Global LNG, LLC	Along the Calcasieu River, Cameron Parish	22.8	Proposed	<ul style="list-style-type: none"> Export of approximately 5 mtpa (approximately 0.7 bcf/day) up to 244 Bcf per year of natural gas domestically produced LNG from a proposed mid-scale natural gas liquefaction and LNG export terminal. 	<ul style="list-style-type: none"> New and maintenance dredging, new ballast water Additional marine traffic Groundwater use during construction; municipal water during operations Additional security vessels that temporarily prohibit recreational use Major air emission source

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					Sources: <ul style="list-style-type: none"> ▪ http://venturegloballng.com/ ▪ http://www.fossil.energy.gov/programs/gasregulation/authorizations/2013_application/Venture_Global_LLC_-_13-69-LNG1.html 	<ul style="list-style-type: none"> ▪ Noise during construction ▪ Addition of new large LNG storage tanks
8	Sasol North America, Inc. - Westlake GTL Plant	Westlake, Calcasieu Parish	9.8	Proposed Expected operation in 2019 (phase one) and 2020 (phase two)	<ul style="list-style-type: none"> ▪ GTL facility that will convert natural gas into diesel. Sources: <ul style="list-style-type: none"> ▪ http://www.sasollouisianaprojects.com/page.php?page=Gas-To-LiquidsFacility ▪ http://www.louisianaeconomicdevelopment.com/page/sasol 	<ul style="list-style-type: none"> ▪ Major air emission source ▪ Converting existing land use to industrial use ▪ Noise and traffic during construction and operations ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
9	Sasol North America Inc. - Lake Charles Chemical Complex	Westlake, Calcasieu Parish	10.1	In Permitting. Operations expected 2017.	<ul style="list-style-type: none"> ▪ Expansion of existing facilities with an ethane cracker facility, 650-acre site near Sasol's existing facilities in Westlake, LA. ▪ 350 retained jobs, 1,289 new jobs, 5,886 indirect, 7,000 construction jobs, \$89,000 average salary and benefits. Source: <ul style="list-style-type: none"> ▪ http://www.sasollouisianaprojects.com/page.php?page=World-scaleethanecracker 	<ul style="list-style-type: none"> ▪ Major air emission source ▪ Converting of existing land use to industrial ▪ Noise and traffic during construction and operations ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
10	Lake Charles Clean Energy LLC (Leucadia)	Lake Charles, Calcasieu Parish	5.7	Under Construction; expected operation in 2017	<ul style="list-style-type: none"> Facility to convert petroleum coke to methanol. Annual payroll expenditures of \$340 million over the three-year construction period; 200 new full-time jobs, 3,000 construction jobs. <p>Sources:</p> <ul style="list-style-type: none"> http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%209%204%2013.pdf http://energy.gov/nepa/downloads/eis-0464-epa-notice-availability-final-environmental-impact-statement 	<ul style="list-style-type: none"> Major air emission source Converting existing land use to industrial use Noise and traffic during construction and operations Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
11	Westlake Chemical Corporation	Lake Charles, Calcasieu Parish	5.9	Under Construction	<ul style="list-style-type: none"> Expansion of Petro 2 ethylene unit at existing facility to increase ethane-based ethylene capacity by approximately 230 to 240 million pounds annually in support of the company's ethylene integration strategy. 400 construction jobs, 5 new jobs, 393 retained jobs. <p>Source:</p> <ul style="list-style-type: none"> http://westlake.com/fw/main/default.asp?DocID=68&reqid=1773152 	<ul style="list-style-type: none"> Major air emission source Converting existing land use to industrial use Noise and traffic during construction and operations
12	G2X Energy	Lake Charles, Calcasieu Parish	0.5	In Permitting. Construction expected 2015; operations by 2018.	<ul style="list-style-type: none"> \$1.3 billion natural gas-to-gasoline facility will produce 12,500 barrels per day of 87 octane gasoline using methanol-to-gasoline technology licensed from ExxonMobil Research and Engineering. 	<ul style="list-style-type: none"> New and maintenance dredging Additional marine traffic Groundwater use during construction; municipal water during operations

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					<ul style="list-style-type: none"> ▪ 1,000 construction jobs, 748 indirect jobs, 243 new jobs, \$66,500 per year plus benefits. ▪ G2X has filed for an air permit with the LDEQ and USEPA and for a permit with the U.S. Army Corps of Engineers. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://g2xenergy.com/press/governor-jindal-highlights-g2x-energy-plans-for-1-3-billion-natural-gas-to-gasoline-facility-in-southwest-louisiana/ ▪ http://www.smartenergyuniverse.com/alternative-energy/11320-g2x-energy-plans-1-3-billion-natural-gas-to-gasoline-facility-in-southwest ▪ http://g2xenergy.com/plants/ ▪ http://www.americanpress.com/The-eight-petrochemical-companies-fueling-upcoming-economic-boom 	<ul style="list-style-type: none"> ▪ Major air emission source ▪ Noise and traffic during construction and operations ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
13	Juniper GTL, LLC	Westlake, Calcasieu Parish	8.9	Proposed	<ul style="list-style-type: none"> ▪ \$100 million investment at the existing steam methane reformer to convert the facility for gasoline production. ▪ Estimated 29 jobs created; average salary of \$85,000 per year with benefits, 112 indirect jobs. <p>Source:</p> <ul style="list-style-type: none"> ▪ http://www.areadevelopment.com/newsletters/9-5-2013/juniper-gtl-renovation-calcasieu-parish-louisiana489242.shtml 	<ul style="list-style-type: none"> ▪ Major air emission source ▪ Noise and traffic during construction and operations ▪ Workforce (new jobs); use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
14	BP Biofuels	Jennings, Jefferson Davis Parish	39.5	Completed	<ul style="list-style-type: none"> ▪ BP operates a 1.4 million gallon cellulosic demonstration facility in Jennings and is considering expansion to produce 30 million gallons of alternative fuel annually. ▪ \$400 million capital investment and 75 to 100 new jobs. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20report%209%204%2013.pdf ▪ http://www.bp.com/sectiongenericarticle.do?categoryId=9030047&contentId=7055177 	<ul style="list-style-type: none"> ▪ Potential major air emission source ▪ Noise and traffic during construction and operations
Industrial – Other						
15	Kinder Morgan Louisiana Pipeline	Lake Charles, Calcasieu Parish/ Eunice, Acadia Parish	0.00 and 52.4	Permitting	<ul style="list-style-type: none"> ▪ Modifying existing delivery meter facilities to make them bidirectional; the installation of compression facilities near Eunice, LA, and the delivery facilities at the proposed Magnolia liquefaction facility interconnect. <p>Source: Precedent Agreement between Magnolia LNG and KMLP</p>	<ul style="list-style-type: none"> • Potential major air emission source • Noise and traffic during construction • Workforce (new jobs); use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
16	Northrop Grumman	Lake Charles, Calcasieu Parish	11.2	Completed	<ul style="list-style-type: none"> ▪ New 800,000+ square feet hangar at the Lake Charles Maintenance and Modification Center (LCMMC) as part of a larger 1,050-acre aircraft modification center located at Chennault Airport. ▪ \$3.6 million capital investment. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://www.northropgrumman.com/Capabilities/LakeCharlesMaintenanceCenter/Pages/default.aspx ▪ http://www.gov.state.la.us/index.cfm?md=newsroom&tmp=detail&articleID=3373 	<ul style="list-style-type: none"> ▪ Minor air emission source ▪ Noise and traffic during construction and operations ▪ Capital investments and tax revenue
17	W.R. Grace & Company	Sulphur, Calcasieu Parish	4.2	Completed	<ul style="list-style-type: none"> ▪ Chemical plant in Sulphur, LA. ▪ \$150-million investment. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://www.siteselection.com/issues/2013/mar/ip-swloisiana.cfm ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf 	<ul style="list-style-type: none"> ▪ Major air emission source ▪ Noise and traffic during construction and operations ▪ Use of public services; tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
18	PSI Midstream Partners, L.P.	Cameron Parish	31.0	Proposed	<ul style="list-style-type: none"> ▪ Changes to the existing 500-MMcfd gas processing plant located near Johnson Bayou in Cameron Parish. ▪ \$15-million investment and 20 additional construction jobs. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://www.siteselection.com/issues/2013/mar/ip-swloisiana.cfm ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf ▪ http://www.psimidstream.com/latest-news/ 	<ul style="list-style-type: none"> ▪ Potential new emissions ▪ Noise and traffic during construction and operations ▪ Workforce requirements (new jobs); use of public services; capital investments and tax revenue
19	West Calcasieu Port	West Calcasieu Port, Calcasieu Parish	4.1	Completed	<ul style="list-style-type: none"> ▪ \$2.3 million investment for 800 linear feet of barge basin shoreline for an additional 25 to 30 barge slips. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf ▪ http://www.westcalport.com/PressRoom/PressRoomDisplay.asp?p1=5664&p2=Y 	<ul style="list-style-type: none"> ▪ Air emissions from barges and tugs ▪ Noise and traffic during construction and operations ▪ Capital investments

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
20	Talon Midstream L.P.	Westlake, Calcasieu Parish	8.8	Proposed	<ul style="list-style-type: none"> ▪ An industrial plant for pipeline and related structures. ▪ \$250 million investment, 250 additional construction jobs, 30 new jobs. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://www.siteselection.com/issues/2013/mar/ip-swloisiana.cfm ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf 	<ul style="list-style-type: none"> ▪ Potential new air emissions ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
Commercial, including Entertainment and Hotels						
21	HRI Properties	Lake Charles, Calcasieu Parish	9.6	Proposed	<ul style="list-style-type: none"> ▪ 150-room, six-story hotel. ▪ \$19 million capital investment. <p>Source:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20projects%20%20report%20detailed%20updated%209.4.13.pdf 	<ul style="list-style-type: none"> ▪ Minor construction and operating emissions ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
22	Golden Nugget (formerly Pinnacle Entertainment, Inc. / Ameristar Casinos, Inc.)	Lake Charles, Calcasieu Parish	6.7	Under Construction. Opening 2014	<ul style="list-style-type: none"> ▪ Hotel expansion adjacent to the L'Auberge Casino Resort. ▪ 1,800 construction jobs, 1,500 new jobs, \$400 to \$500 million capital investment. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20projects%20%20report%20detailed%20updated%209.4.13.pdf 	<ul style="list-style-type: none"> ▪ Minor construction and operating emissions ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					<ul style="list-style-type: none"> ▪ 2-2018%20swla%20detailed%20projects%20report%208%2022%2013%20.pdf 	
23	Hampton Inn	Lake Charles, Calcasieu Parish	7.2	Completed	<ul style="list-style-type: none"> ▪ New 85-room hotel near the cross section of Holly Hill and Prien Lake Roads. <p>Source:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report (February 3, 2014): http://allianceswla.org/ 	<ul style="list-style-type: none"> ▪ Minor construction and operating emissions ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
24	Coushatta Casino Resort	Kinder, Allen Parish	41.6	Completed 2012	<ul style="list-style-type: none"> ▪ Seven-story, \$60 million hotel expansion at the Coushatta Casino Resort added 400 new rooms. ▪ 1,000 construction jobs, 150 permanent employees. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20report%208%2022%2013%20.pdf ▪ http://www.coushattacasinoresort.com/media/140/ 	<ul style="list-style-type: none"> ▪ Minor construction and operating emissions ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Workforce requirements; use of public services; tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
25	L'Banca Albergo Hotel	Lake Arthur, Jefferson Davis Parish	37.2	Completed	<ul style="list-style-type: none"> ▪ New 8-room hotel. ▪ \$500,000 capital investment. ▪ 8 to 10 new jobs <p>Source:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/ February 3, 2014 SWLA report 	<ul style="list-style-type: none"> ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Use of public services; tax revenue
26a	SOWELA Technical Community College	Lake Charles, Calcasieu Parish	10.8		<ul style="list-style-type: none"> ▪ Industrial Training Facility to initially support workforce needs during construction and operations of the new Sasol plants and to serve the broader needs of growing manufacturers throughout the region. ▪ \$20 million investment. <p>Source:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20report%208%2022%2013%20.pdf 	<ul style="list-style-type: none"> ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Workforce and housing requirements (housing requirement minor); use of public services; capital investments and tax revenue
26b	SOWELA Technical Community College	Lake Charles, Calcasieu Parish	10.8	Under Construction. Expected to be completed in March 2014.	<ul style="list-style-type: none"> ▪ Nursing and Allied Health Building project. ▪ \$8.8 million investment. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20report%208%2022%2013%20.pdf 	<ul style="list-style-type: none"> ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Workforce and housing requirements (housing requirement minor); use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					<ul style="list-style-type: none"> ▪ http://www.sowela.edu/chancellor.asp 	
27	Southwest Louisiana Entrepreneuria l and Economic Development (SEED) Center	Lake Charles, Adjacent to the McNeese State University campus, Calcasieu Parish	6.7	Operating	<ul style="list-style-type: none"> ▪ 32-office, 50,000-square-foot building. ▪ An incubator for startup and existing small businesses and will provide counseling and mentoring services to boost economic development in the region. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf ▪ http://www.gov.state.la.us/index.cfm?md=newsroom&tmp=detail&articleID=4200 	<ul style="list-style-type: none"> ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Use of public services; tax revenue
28	Mardi Gras Boardwalk	Lake Charles, Calcasieu Parish	9.5	Proposed. Expect construction in 2014.	<ul style="list-style-type: none"> ▪ \$50.4 million capital investment in former Harrah's property including 135 hotel rooms, restaurants, and shops. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf ▪ http://www.americanpress.com/Informer-2-2-14 	<ul style="list-style-type: none"> ▪ Minor construction and operating emissions ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Workforce and housing requirements; use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
29	Chennault International Airport/New Hanger	Lake Charles, Calcasieu Parish	11.3	Under Construction	<ul style="list-style-type: none"> ▪ Airport expansion project that will add a new 112,000- to 115,000-square-foot maintenance and repair hangar. ▪ 500 new jobs. <p>Source:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/ February 3, 2014 SWLA report. 	<ul style="list-style-type: none"> ▪ Workforce and housing requirements; use of public services; capital investments and tax revenue
30	Farmers Rice Milling Co.	Lake Charles, Calcasieu Parish	12.1	Unknown	<ul style="list-style-type: none"> ▪ \$13.4 million capital investment to expand mill with an additional 55,000 square feet and use of robots. ▪ Some temporary construction jobs. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/ February 3, 2014 SWLA report. ▪ http://wwwprd1.doa.louisiana.gov/LaNews/PublicPages/Dsp_PressRelease_Display.cfm?PressReleaseID=3384&Rec_ID=0 ▪ http://www.foodmanufacturing.com/news/2013/01/rice-mill-plans-134m-expansion 	<ul style="list-style-type: none"> ▪ Minor construction and operating emissions ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction and operations ▪ Workforce and housing requirements; use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
31	Scope Technologies, Inc.	near the McNeese campus, Lake Charles, Calcasieu Parish	6.5-7	Unknown	<ul style="list-style-type: none"> ▪ Testing facility for the ES 25 Energy Saver, transformer based power voltage optimizer that connects to incoming electric power supply. ▪ 7 to 15 new jobs created in phase 1, 30 to 45 people with phases 2 and 3 expansions; 32 indirect jobs. <p>Source:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/ February 3, 2014 SWLA report. 	<ul style="list-style-type: none"> ▪ Workforce and housing requirements; use of public services; capital investments and tax revenue
32	Zagis Expansion	Lacassine, Jefferson Davis Parish	22.9	Unknown	<ul style="list-style-type: none"> ▪ 50,000 square foot expansion of the Zagis cotton spinning plant. ▪ 30 new jobs/60 retained jobs. <p>Source:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/ February 3, 2014 SWLA report. 	
33	Boise's DeRidder Paper Mill	Beauregard Parish	52.2	Proposed	<ul style="list-style-type: none"> ▪ \$111 million to upgrade the existing paper mill. ▪ 54 new direct jobs/444 retained, 222 new indirect jobs, an estimated 600 construction jobs. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/ February 3, 2014 SWLA report. 	<ul style="list-style-type: none"> ▪ Potential new operating emissions ▪ Workforce and housing requirements; use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					<ul style="list-style-type: none"> ▪ http://www.louisianaeconomicdevelopment.com/index.cfm/newsroom/detail/248 ▪ http://www.beauregarddailynews.net/article/20131001/NEWS/130939965 	
Residential						
34	Belle Savanne	Sulphur, Calcasieu Parish (Sulphur/Carlyss area)	9.3	Under Construction.	<ul style="list-style-type: none"> ▪ Mixed residential and commercial development of initial 27 acres expanding to about 300 acres comprised of about 1,200 lots. ▪ \$60 million capital investment, future plans for \$25 million dollars of infrastructure, expected housing construction expenditures of approximately \$210 million. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf ▪ http://www.mvn.usace.army.mil/Portals/56/docs/regulatory/publicnotices/MVN_2013_01439_WPP_PNALL.pdf 	<ul style="list-style-type: none"> ▪ Minor emissions during construction ▪ Additional vehicle traffic ▪ Workforce and housing requirements (minor); use of public service (minor); capital investments and tax revenue
35	Lakes at Morganfield	Lake Charles, Calcasieu Parish	8.3	Proposed	<ul style="list-style-type: none"> ▪ Mixed residential and commercial development, initially of 110 home sites, expanding to 600 to 700 homes over a five- to eight-year period. ▪ \$350 million capital investment. ▪ 277.4 acres of land located off La. Highway 14. 	<ul style="list-style-type: none"> ▪ Minor emissions during construction ▪ Additional vehicle traffic ▪ Workforce requirements; use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					Source: <ul style="list-style-type: none"> SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf 	
36	Pelican Lodge Workforce Housing	East side of Lake Charles (near Chenault)	8.2	Under Construction. Operation by mid-2015.	<ul style="list-style-type: none"> An industrial employee housing facility that will hold up to 4,000 workers on 200 acres of Port of Lake Charles property. 400 construction jobs, \$70 million. Sources: <ul style="list-style-type: none"> SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf http://www.americanpress.com/Work-starting-on-Lake-Area-employee-village 	<ul style="list-style-type: none"> Minor emissions during construction Additional vehicle traffic Workforce requirements; use of public services; capital investments and tax revenue
37	Walnut Grove Development	Lake Charles, Calcasieu Parish	7.7	Under Construction	<ul style="list-style-type: none"> Mixed-use community of 180 residential properties and commercial facilities on 60 acres on the west end of Sallier Street down from the Port of Lake Charles. It is expected that the development would be completed by 2020. Source: <ul style="list-style-type: none"> SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf 	<ul style="list-style-type: none"> Minor emissions during construction Additional vehicle traffic Workforce requirements; use of public services; capital investments and tax revenue
38	Willow Brook	Near	3.0	Proposed	<ul style="list-style-type: none"> 138 single-family, 1,600- to 2,500-square- 	<ul style="list-style-type: none"> Minor emissions during construction

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
		Graywood, Calcasieu Parish			<p>foot homes on 30 acres.</p> <p>Source:</p> <ul style="list-style-type: none"> SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20report%208%2022%2013%20.pdf 	<ul style="list-style-type: none"> Additional vehicle traffic Workforce requirements; use of public services; capital investments and tax revenue
39	D R Horton	Graywood, Calcasieu Parish	2-3	Proposed	<ul style="list-style-type: none"> 15 homes. <p>Source:</p> <ul style="list-style-type: none"> SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20report%208%2022%2013%20.pdf 	<ul style="list-style-type: none"> Minor emissions during construction Additional vehicle traffic Use of public services (minor); tax revenue
Government Facilities						
40	Louisiana Marine Fisheries Enhancement, Research, and Science Center	Lake Charles, Calcasieu Parish	0.1	Proposed	<ul style="list-style-type: none"> Louisiana Department of Wildlife and Fisheries proposed \$22 million research and enhancement of marine fisheries and long-term monitoring of fishery resource, production of spotted seatrout, red drum, and southern flounder. Three 0.5-acre ponds for propagation and research, a water reservoir with pipeline and water intake station, and an effluent pump station. <p>Sources:</p> <ul style="list-style-type: none"> E-mail communication of July 24, 2013, from Duet, Jason with Louisiana Wildlife and Fisheries to William Daughdrill of Ecology and Environment, Inc. 	<ul style="list-style-type: none"> Minor emissions during construction Workforce requirements; use of public services (minor); capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					<ul style="list-style-type: none"> ▪ http://www.gulfspillrestoration.noaa.gov/wp-content/uploads/Fish_Hatchery_Factsheet_finalproof.pdf 	
41	National Hurricane Museum and Science Center	Lake Charles (across Bord du Lac Drive from the Civic Center)	9.1	Proposed	<ul style="list-style-type: none"> ▪ \$66 million capital investment ▪ Still in the fundraising stage; in May 2013, the Port of Lake Charles came to an agreement to give the museum \$3 million. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/ February 3, 2014 SWLA report. ▪ http://www.cityoflakecharles.com/egov/apps/document/center.egov?view=item&id=695 ▪ http://www.nhmsc.com/project-research 	<ul style="list-style-type: none"> ▪ Minor emissions during construction

- Industrial – Gas/Chemical/Gas-to-Liquids (GTL)**
- 1 - Sabine Pass LNG Export Terminal (Cheniere Energy, Inc.)
 - 2 - Trunkline LNG, LLC - Lake Charles Export Terminal
 - 3 - Cameron LNG, LLC
 - 4 - Golden Pass LNG
 - 5 - Waller Point LNG
 - 6 - Gasfin Development USA, LLC
 - 7 - Venture Global LNG, LLC
 - 8 - Sasol North America, Inc. - Westlake GTL Plant
 - 9 - Sasol North America, Inc. - Lake Charles Chemical Complex
 - 10 - Lake Charles Clean Energy LLC - Leucadia
 - 11 - Westlake Chemical Corporation
 - 12 - G2X Energy
 - 13 - Juniper GTL, LLC
 - 14 - BP Biofuels
- Industrial – Other**
- 15 - Kinder Morgan Louisiana Pipeline
 - 16 - Northrop Grumman
 - 17 - W.R. Grace & Company
 - 18 - PSI Midstream Partners, L.P.
 - 19 - West Calcasieu Port
 - 20 - Talon Midstream L.P.
- Commercial, including Entertainment and Hotels**
- 21 - HRI Properties
 - 22 - Golden Nugget
 - 23 - Hampton Inn
 - 24 - Coushatta Casino Resort
 - 25 - L'Banca Albergo Hotel
 - 26 - SOWELA Technical Community College
 - 27 - Southwest Louisiana Entrepreneurial and Economic Development (SEED) Center
 - 28 - Mardi Gras Boardwalk
 - 29 - Chennault International Airport/New Hanger
 - 30 - Farmers Rice Milling Co.
 - 31 - Scope Technologies, Inc.
 - 32 - Zagis Expansion
 - 33 - Boise's DeRidder Paper Mill
 - 34 - Belle Savanne
 - 35 - Lakes at Morganfield
 - 36 - Pelican Lodge Workforce Housing
 - 37 - Walnut Grove Development
 - 38 - Willow Brook
 - 39 - D. R. Horton
- Recreational Facilities**
- 40 - Louisiana Marine Fisheries Enhancement, Research, and Science Center
 - 41 - National Hurricane Museum & Science Center

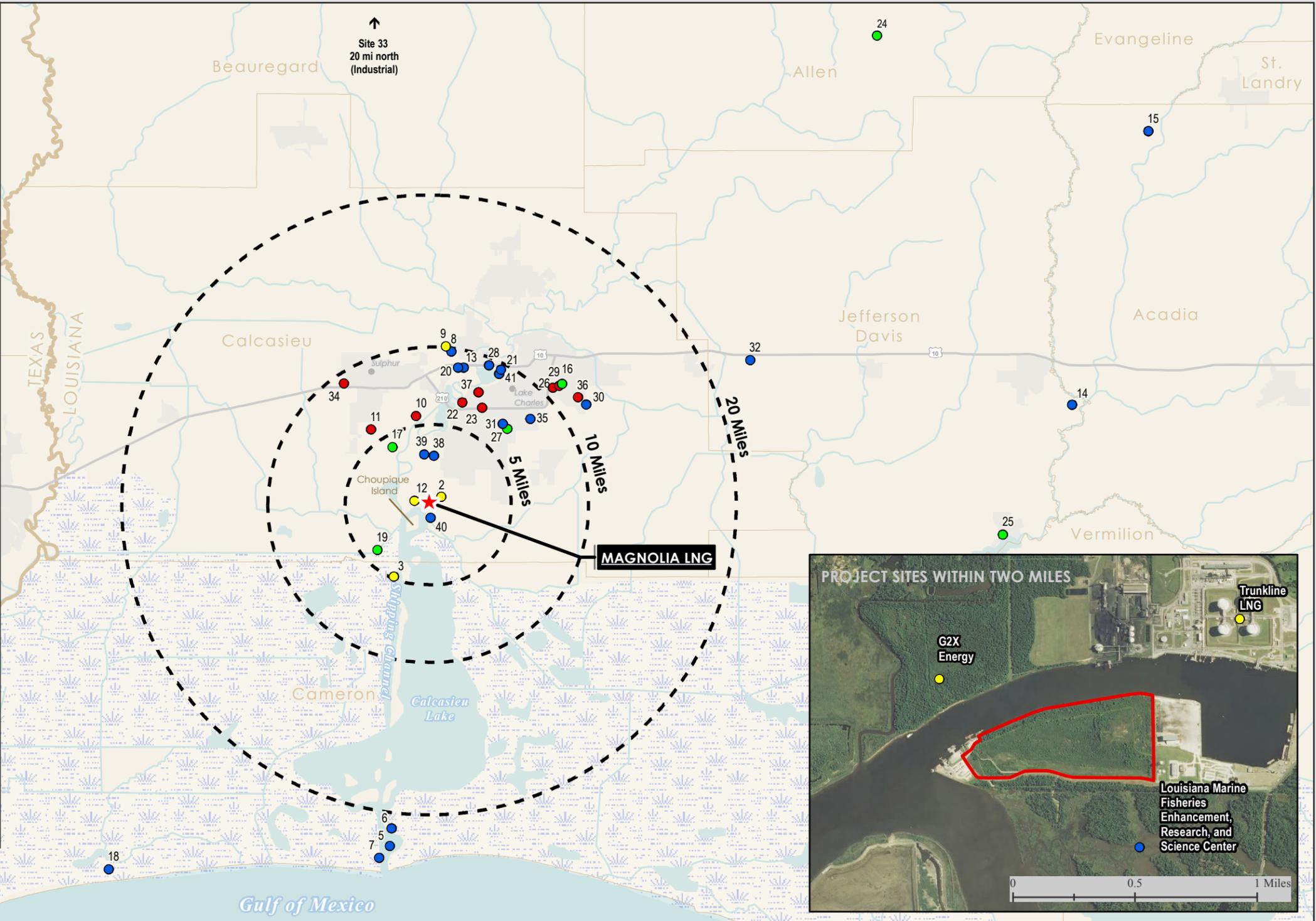


Figure 1.9-1
Projects Considered in the
Cumulative Impact Analysis
 Magnolia LNG
 Calcasieu Parish, Louisiana

Legend

- ★ Magnolia LNG Site
- ⊞ Magnolia Site Buffer
- ▭ Proposed Magnolia LNG Site (inset)

Timeframe

- Proposed/Unknown
- In Permitting
- Under Construction
- Completed/Operating

0 5 10 Miles
 1:470,000

Source- ESRI 2012, NAIP 2013
 Image Date- 08/27/2013
 Date: 4/27/2014

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The proposed Louisiana Marine Fisheries Enhancement, Research, and Science Center, planned immediately southeast of the Project site (see Section 1.1.3), is the closest to the Project site of all the projects listed in Table 1.9-1. On February 6, 2014, a meeting was held with Jason Duet and Craig Gothreaux with the Louisiana Department of Wildlife and Fisheries (LDWF) regarding the Fisheries Research Center to gather additional information about the proposed facility, including the timing for its construction.¹⁰ The LDWF anticipates that it will be at least four years before they break ground on the research center. So far, the LDWF has completed a high-level concept study of the center, started an environmental assessment of the project, and initiated coordination efforts with state and federal regulatory agencies to determine what permits are required. During the meeting, it was stated that funding for the project came from the Louisiana Oil Spill Coordinator's office as an early Natural Resources Damage Assessment (NRDA) project (paid for through early NRDA funding provided by BP as a result of the Gulf of Mexico Macondo oil spill in April 2010) and they would turn the project over to the State Office of Facility Planning. Facility Planning would then issue the Request for Proposal (RFP) for the design of the facility; once the facility is designed, they would issue bids for construction. The current Magnolia LNG construction schedule (see Appendix 1.D) calls for all dredging to be completed in the first quarter of 2016. Due to the length of the permitting, design, and construction process, the water intake structure for the proposed Louisiana Marine Fisheries Enhancement, Research, and Science Center is not expected to be operational during dredging and construction activities of the proposed Magnolia LNG Project. Therefore, it is not included in the cumulative impacts analysis.

The following reasonably foreseeable projects were evaluated further depending on the level of information available. The numbers listed here correspond to the numbers in Table 1.9-1 and on Figure 1.9-1:

1. Sabine Pass LNG Export Terminal (Cheniere Energy, Inc.)
2. Trunkline LNG, LLC, Lake Charles Export Terminal (Trunkline LNG project)
3. Cameron LNG, LLC
4. Golden Pass LNG
9. Sasol North America Inc. - Lake Charles Chemical Complex
10. Lake Charles Clean Energy LLC
11. Westlake Chemical Corporation
12. G2X Energy
15. Kinder Morgan Louisiana Pipeline
34. Belle Savanne

Detailed discussions of the cumulative impacts that the identified projects and the Magnolia LNG Project would have on each applicable environmental resource is provided in the appropriate Resource Reports.

¹⁰ Meeting Minutes, Magnolia LNG Meeting with LDWF, Office of Fisheries (J. Duet and C. Gothreaux), regarding the proposed Fisheries Research Center (February 6, 2014).

The analyses consider the incremental impacts of the proposed Project and non-jurisdictional components that when added to the impacts of other past, present, and reasonably foreseeable future actions would affect the same resources in the same timeframe within the same geographic boundary. The geographic boundary for each resource area is restricted to areas around where the resource could be affected by the proposed Project or non-jurisdictional components and by the presence of the resource. For example, the geographic boundary for overlapping air quality impacts during construction would be within 0.5 mile of the proposed Project and during operation would be the Area of Impact determined by modeling to obtain the required state and federal permits for the Project.

Each Resource Report briefly summarizes the incremental minor or greater impacts from the proposed Project or non-jurisdictional components and the expected environmental effects of the reasonably foreseeable future projects identified in Table 1.9-1. The impacts were evaluated collectively to produce a description of the potential combined or cumulative environmental effects.

1.10 PERMITS AND APPROVALS

Construction, operation, and maintenance of the Project facilities would be in accordance with all applicable rules and regulations, permits, and approvals. Applicable permits and approvals for the Project facilities are summarized in Appendix 1.E along with the schedule for filing of all major permits or appropriate documentation.

Major permit and approval actions for the Project involving multiple regulatory agencies would include environmental reviews by the FERC for authorization of the liquefaction facilities under Section 3 of the NGA; the U.S. Department of Energy (DOE) for authorization to export LNG to both Free Trade Agreement (FTA) countries and non-FTA countries; the USACE for activities affecting wetlands and waterways; the USCG's approval of the WSA; and the LDEQ for a permit to authorize air emissions under the Clean Air Act.

On December 18, 2012, as part of the Project development, Magnolia filed an application with the DOE, Office of Fossil Energy to export up to 4 mtpa of LNG to countries that currently have, or in the future will have, an FTA with the United States. On February 26, 2013, DOE approved Magnolia's request to export 4 mtpa of LNG to FTA countries in its own right and/or as agent for others for selected LNG tolling parties and LNG buyers.

On October 11, 2013, Magnolia filed an application with the DOE, Office of Fossil Energy, to export up to 8 mtpa of LNG to countries that do not have an FTA with the United States requiring national treatment for trade of natural gas and LNG, which have or in the future develop the capacity to import LNG via ocean-going carrier, and with which trade is not prohibited by U.S. law or policy (i.e., non-FTA countries). The DOE approved this request on March 5, 2014, in DOE/FE Order No. 3406. Magnolia also filed an application with the DOE, Office of Fossil Energy, which was docketed on October 15, 2013, for export of an additional 4 mtpa of LNG to countries that currently have, or in the future will have, an FTA with the United States in order to represent the full production capacity of the Project. Magnolia's non-FTA application notice was officially published in the *Federal Register* on March 24, 2014 (Volume

79, No. 56, page 15980), triggering the opening of the 60-day comment period, which will close on May 23, 2014.

Finally, with regard to the fourth factor, federal control is determined by the amount of federal financing, assistance, direction, regulation, or approval inherent in a project. The non-jurisdictional facilities associated with the Magnolia LNG Project would be developed without federal financing or guarantees. Magnolia is a private company and the non-jurisdictional facilities would be constructed by private companies under state and local regulatory jurisdiction. Some federal permits may be involved, but no federal lands are involved. Therefore, this factor does not support a review of the non-jurisdictional facilities.

1.11 AGENCY AND PUBLIC COMMUNICATIONS

Magnolia has commenced discussions with relevant local, state, and federal agencies. An open house for the proposed Project occurred on May 2, 2013, at the Pujoe Street Café Banquet Room, 901 Ryan Street, Lake Charles, Louisiana 70601.

In compliance with 18 CFR § 157.206(d)(2), Magnolia sent written notifications to all landowners identified within 0.5 mile of the proposed facilities within three business days following the Commission's Notice of Application. The names and mailing addresses of landowners within 0.5 mile of the Project site are listed in Appendix 1.F and the appendix has been marked as "*PRIVILEGED*."

Commencing in November 2012, Magnolia held either group or one-on-one meetings with the following agencies and organizations to provide information about the Project:

- FERC, Washington, DC
- DOE, Washington, DC
- USACE, New Orleans, Louisiana
- USFWS, Lafayette, Louisiana
- National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Baton Rouge, Louisiana
- USCG Captain of the Port, Port Arthur, Texas
- USCG Marine Safety Unit, Lake Charles, Louisiana
- LDEQ, Baton Rouge, Louisiana
- Louisiana Department of Natural Resources (LDNR), Baton Rouge, Louisiana
- LDNR, Office of Conservation, Baton Rouge, Louisiana
- Louisiana Office of Cultural Development (State Historic Preservation Officer), Baton Rouge, Louisiana
- LDWF, Baton Rouge, Louisiana
- LDWF, Louisiana Natural Heritage Program, Baton Rouge, Louisiana
- Louisiana Economic Development, Baton Rouge, Louisiana
- Louisiana Department of Transportation and Development, Baton Rouge, Louisiana
- Southwest Louisiana Economic Development Alliance, Lake Charles, Louisiana
- Lake Charles Pilots Association, Lake Charles, Louisiana

- Lake Area Industry Alliance (LAIA)
- Lake Charles City Council, Lake Charles, Louisiana
- Southwest Louisiana (SWLA) Safety Council, Sulphur, Louisiana
- SWLA Construction Users Council, Lake Charles, Louisiana
- SWLA Economic Development Alliance, Lake Charles, Louisiana
- SWLA Economic Development Alliance, Workforce Development, Lake Charles, Louisiana
- Calcasieu Parish Office of Homeland Security and Emergency Preparedness (OHSEP), Lake Charles, Louisiana
- Calcasieu Parish Police Jury, Lake Charles, Louisiana
- Calcasieu Parish Sheriff's Office, Lake Charles, Louisiana
- Lake Charles City Council, Lake Charles, Louisiana
- City of Lake Charles, Lake Charles, Louisiana
- Lake Charles Fire Department, Lake Charles, Louisiana
- Lake Charles Public Works, Lake Charles, Louisiana

Appendix 1.G includes the lists of federal, state, and local stakeholders, as well as businesses and other organizations with which Magnolia has communicated about the Project.

1.12 FERC NON-JURISDICTIONAL FACILITIES

Non-jurisdictional facilities are those facilities that are related to the Project for the purpose of delivering, receiving, or using the proposed natural gas volumes, and include facilities to be built and owned by other companies, that are not subject to FERC's jurisdiction. The FERC non-jurisdictional facilities associated with the Project include tying-in to portable water and power service, as described below.

FERC has adopted a four-part test to determine whether there is sufficient federal control and responsibility over a project as a whole to warrant environmental analysis of non-jurisdictional facilities. These factors are:

1. Whether or not the regulated activity comprises "merely a link" in a corridor type project (such as a transportation or utility transmission project);
2. Whether there are aspects of the non-jurisdictional facility in the immediate vicinity of the regulated activity which uniquely determine the location and configuration of the regulated activity;
3. The extent to which the entire project will be within FERC's jurisdiction; and
4. The extent of cumulative federal control and responsibility.

The application of this test to the non-jurisdictional facilities associated with the Project demonstrates that there is not a need for FERC to conduct an environmental review of these non-jurisdictional facilities.

With regard to the first factor, the proposed Project is not a corridor type project or a link in a corridor type project. Therefore, this factor does not support a review of the non-jurisdictional facilities.

With regard to the second factor, there are no aspects of the non-jurisdictional facilities that affect the location and configuration of the Project. Therefore, this factor does not support a review of the non-jurisdictional facilities.

With regard to the third factor, the non-jurisdictional facilities are entirely outside of FERC's jurisdiction as the construction of these facilities is under the jurisdiction of the State of Louisiana regulatory agencies and local regulators, as applicable. Therefore, this factor does not support a review of the non-jurisdictional facilities.

1.12.1 Tie-in to Potable Water Service

The Calcasieu Parish District 12 Water Works would provide potable water service. An existing 12-inch water pipeline runs along the entire length of the property just north of Henry Pugh Boulevard. It is expected that this existing 12-inch water pipeline would be sufficient for the Project's potable water needs. No permits are required except for permission to interconnect to the Calcasieu Parish District 12 Water Works. The proposed tie-in location to the 12-inch water pipeline is shown on Figure 1.1-8.

1.12.2 Tie-in to Power Transmission Line

1.12.2.1 Transmission Line and Switching Station Scope of Work

Entergy would provide the base-load power required by the Project. The scope of work needed to serve the Project's power service requirements would include constructing:

- a new 230-kV Ring Bus Switching Station on the Project site. This new substation would be sourced via an in/out cut-in on the Graywood-to-Solac Line (L-609); and
- a new double-circuit 230-kV line of about 1.3 miles between the tap point on L-609 and the new substation.

1.12.2.2 Description of Transmission Line Work Proposed

At full plant nominal capacity of 8 mtpa, the Project is expected to import a base load of approximately 26 MW during normal operating hours (24/7). An additional maximum of 5 MW of power (totaling approximately 31 MW) is expected to be imported from the electrical grid when loading LNG carriers and LNG barges. Power supply to the proposed Project would require a tie-in to the 230-kV transmission line and construction of an incoming feeder to the Project site. Entergy would provide the base-load power required by the Project. Magnolia anticipates requesting from Entergy a total base load of approximately 31 MW. Based on the anticipated Project demand for power from the electrical grid, a load flow analysis was conducted by Entergy to determine options for providing the required total base load requested

by Magnolia. Based on the analysis performed, Entergy determined that there would be no need for upgrading the local transmission system to accommodate the proposed load addition. Figure 1.12-1 shows the existing nearby transmission facilities operated by Entergy.

To deliver the requested base-load power requested by Magnolia, the service proposed by Entergy includes providing a new double-circuit 230-kV transmission line service to the Project site and Entergy would also permit, construct, own, operate and maintain the 230-kV/13.8-kV substation within the Project site. No permits have been applied for by Entergy at this time. Entergy transmission line routing would begin at the Graywood substation at the northeast corner of West Lincoln and Big Lake Roads. It would cross to the south side of West Lincoln Road and proceed west to the Big Lake Road intersection. At the Lincoln and Big Lake Roads intersection, the transmission line would turn south and follow existing right-of-way (ROW) on the east side of Big Lake Road. At the intersection of Henry Pugh Boulevard, the 230-kV line, following the existing ROW, would cross Big Lake Road and follow the Henry Pugh Boulevard ROW on its south side and continue in a westerly direction past Calcasieu Parish District 12 Water Works. From a point on the east side of the Project site, the 230-kV line would turn north crossing over Henry Pugh Boulevard to the new Entergy Magnolia substation within the planned Magnolia LNG Project site.

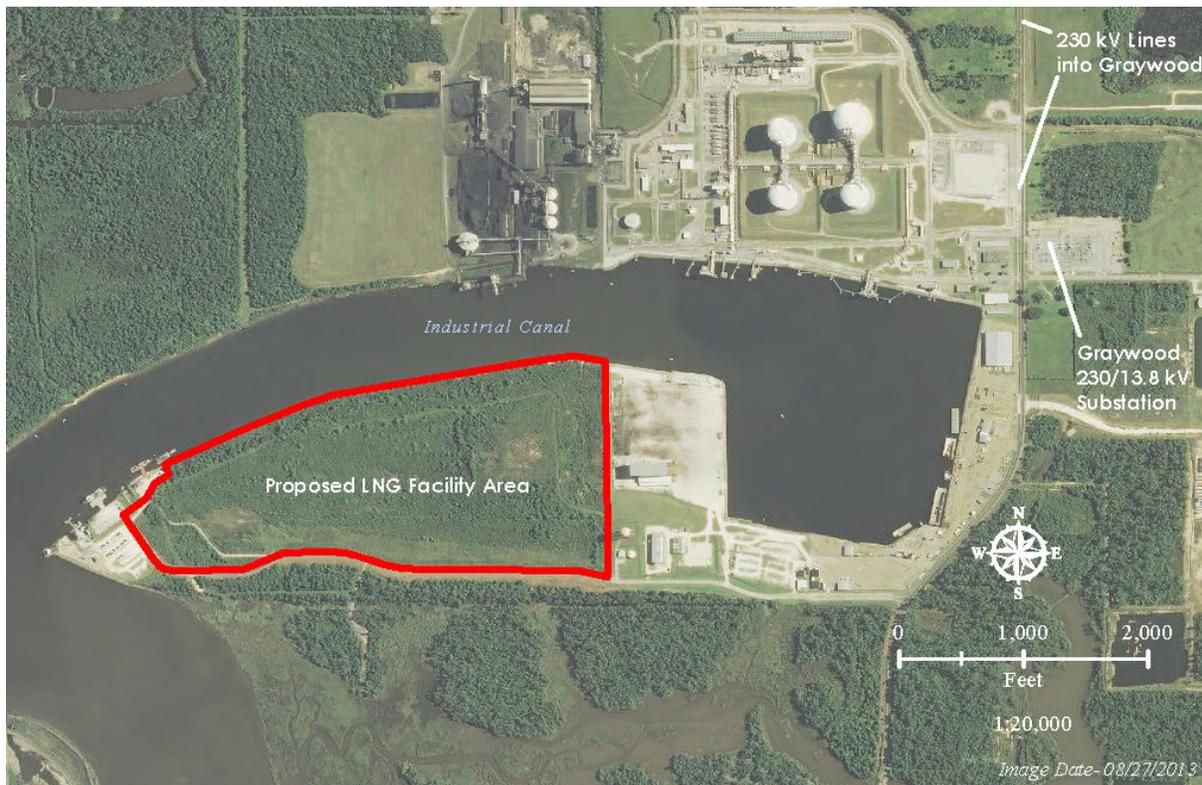


Figure 1.12-1 Site Location with Existing Nearby Transmission Facilities

The new 230-kV transmission line from the Graywood substation to the Magnolia LNG Project site would be approximately 1.3 miles in length. The poles supporting the transmission line wires would be 90 to 110 feet in height, spaced approximately 600 feet apart or as determined during final design. Initial design calls for a right-of-way width of 170 feet. The new right-of-way for the 230-kV transmission line would be adjacent to, or possibly overlap, the existing roadway and utility rights-of-way on Lincoln and Big Lake Roads and Henry Pugh Boulevard. Preparation of the right-of-way would require cutting and clearing of existing trees that might otherwise constitute a hazard to the transmission lines.

The Entergy Magnolia substation would contain the following items:

- Two (2) 230-kV line breakers
- One (1) 230-kV bus tie breaker
- 230-kV switches
- Switchgear
- Electrical relaying
- Communications medium
- Two (2) 230-kV/13.8-kV voltage transformers
- Low side metering (13.8 kV)
- Remote terminal unit (RTU)
- Station service transformer (distribution voltage)
- Control house

Figure 1.12-2 is an aerial view of the Graywood substation, while Figure 1.12-3 illustrates the routing of the new double-circuit 230-kV line and the configuration of the new switching station within the planned Project site.



Figure 1.12-2 Graywood Substation

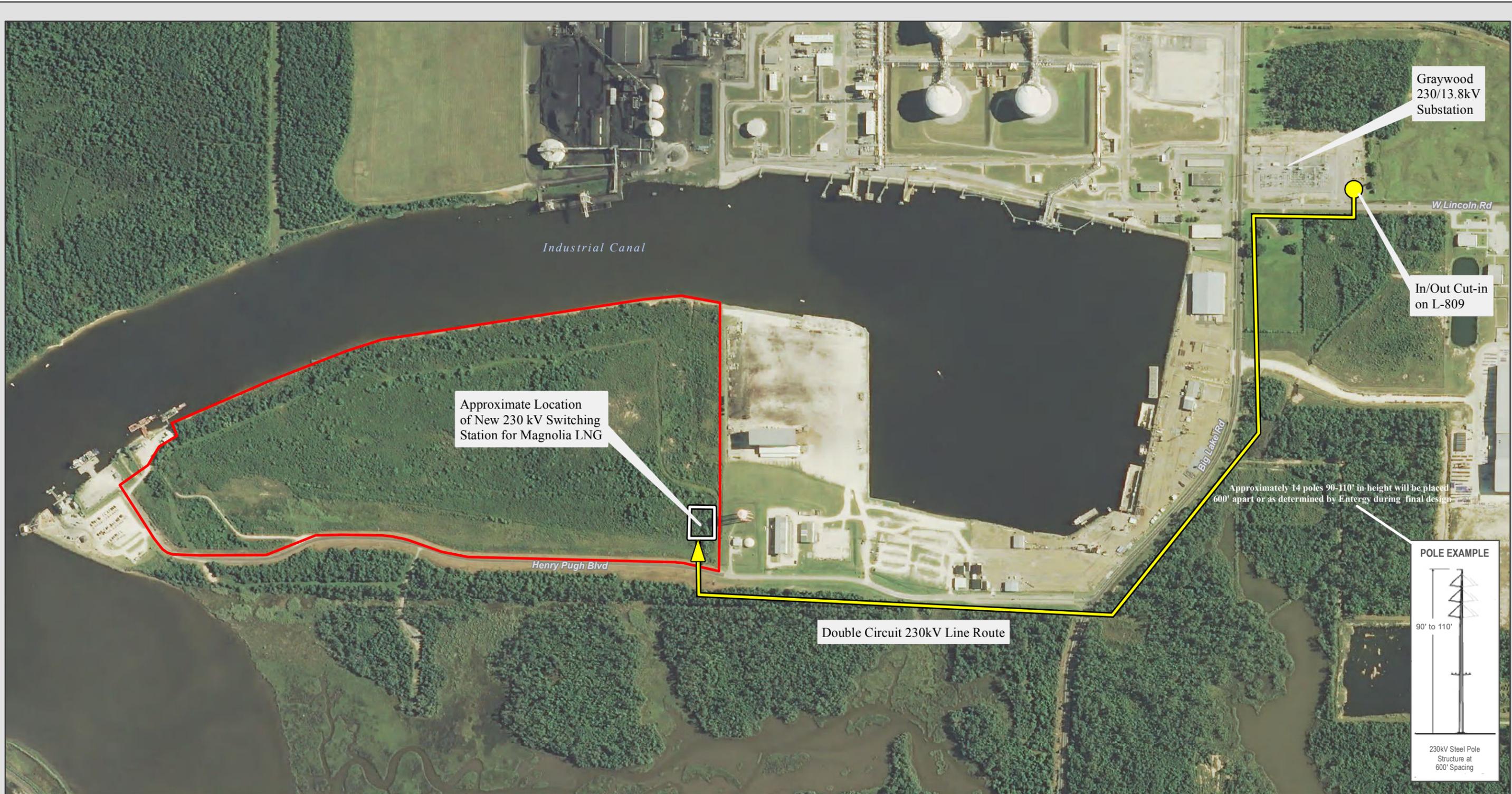


Figure 1.12-3
Proposed Routing of the
230-kV Transmission Line
Magnolia LNG
Calcasieu Parish, Louisiana

-  Proposed Substation
-  Proposed LNG Facility Boundary
-  Proposed Entergy Transmission Line



0 500 1,000 Feet
1:7,500

Source- ESRI 2011, NAIP 2013
Image Date- 08/27/2013
Date: 4/23/2014

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1.13 TRANSPORTATION OF FEED GAS TO THE MAGNOLIA LNG PROJECT

Feed gas would be transported to the site boundary via an existing 42-inch interstate gas pipeline owned by KMLP that passes directly through the project site. The KMLP pipeline can be accessed within the Project site boundary. A short interconnect pipeline of approximately 75 feet and a metering station would be located entirely within the Project site to tie-in the existing underground pipeline to the Gas Gate Station.

The construction and operation of the facilities required to transport the feed gas to the Project will require a separate filing by KMLP with the FERC under Section 7(c) of the NGA. A binding precedent agreement was executed on January 28, 2014, between KMLP and Magnolia (refer to Section 1.5.4.7, “Pipeline Interconnect” for additional information). The precedent agreement generally describes that the facilities to provide the services associated with the supply of feed gas would consist of: (a) construction of a new interconnect and lateral facilities, including any required metering facilities, to connect the proposed Magnolia LNG terminal to KMLP’s line; (b) modification of certain of KMLP’s existing interconnections for primary receipt, which would require that such interconnections be reconfigured as bidirectional points; and (c) adding compression facilities to move sufficient quantities of natural gas in the reverse direction of current flows as shown on Figure 1.13-1. The modifications to the existing KMLP system could include the following as depicted on Figure 1.13-2:

- The existing delivery meter with Columbia Gulf Transmission (CGT) would be modified to be bidirectional such that it can both receive and deliver gas at CGT.
- The existing delivery meter with Texas Gas Transmission (TGT) would be modified to be bidirectional such that it can both receive and deliver gas at TGT.
- The existing delivery meter with ANR Pipeline Company (ANR) would be modified to be bidirectional such that it can both receive and deliver gas at ANR.
- The existing TGT and ANR meter sites would be connected to a new 1.5-mile header pipeline which would feed into a new compressor station to be located near Eunice, Louisiana (Eunice C/S). The Eunice C/S also would be connected to KMLP’s mainline such that it could compress gas received from CGT for delivery to the Magnolia liquefaction interconnect.
- The new KMLP Eunice C/S’s preliminary design calls for 64,000 horsepower, consisting of four Solar Mars 100 turbine compressor units for the full 8 mtpa output capacity. A split suction header design would allow for dual inlet pressures to facilitate efficient use of the compression facilities and reduce fuel consumption, as well as offer additional operational flexibility (refer to RR 9 for additional information).
- The new metering facilities to be installed by KMLP at the Magnolia LNG site.

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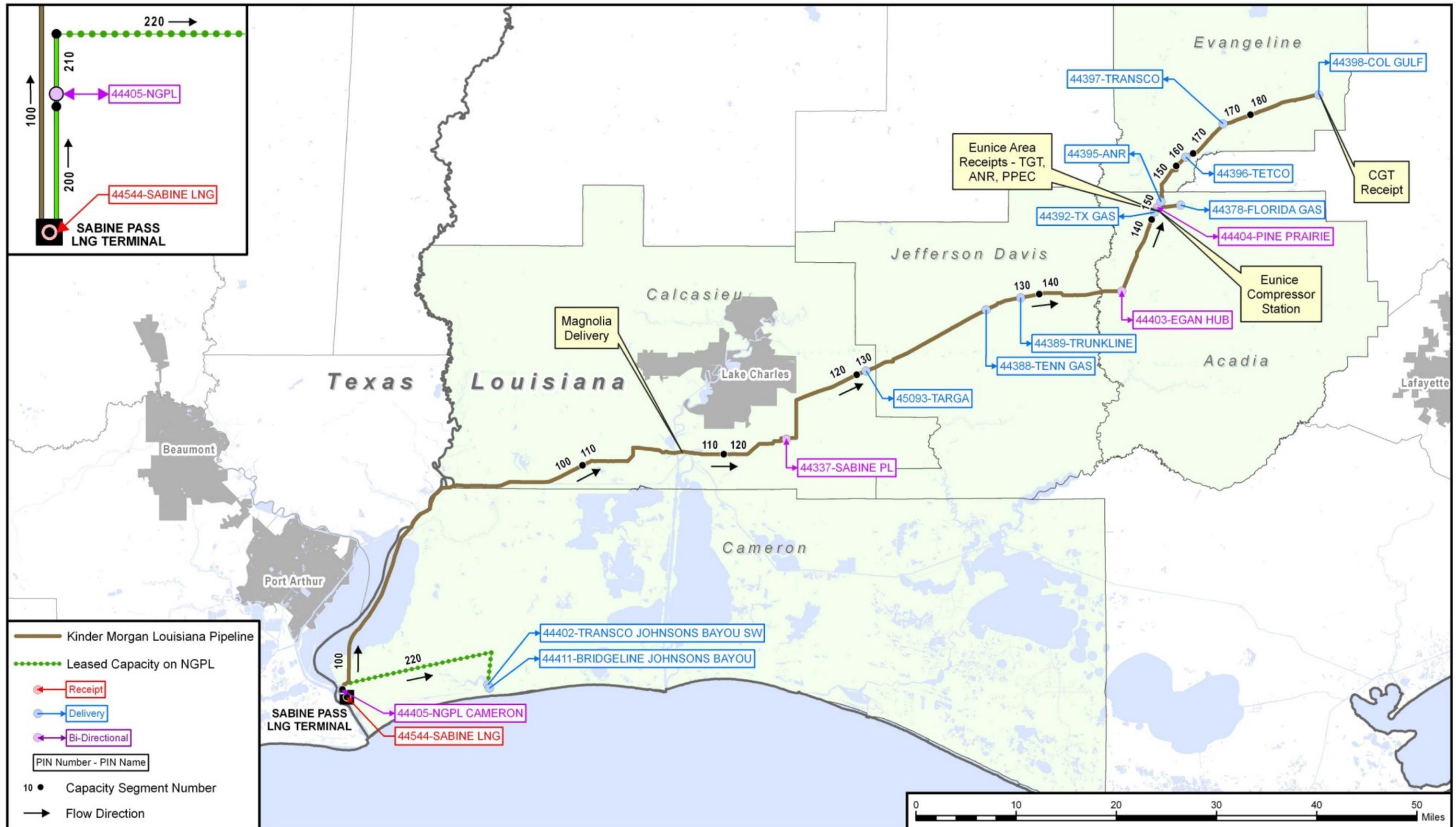


Figure 1.13-1 Proposed Magnolia LNG Project Interconnect with Kinder Morgan Louisiana Pipeline

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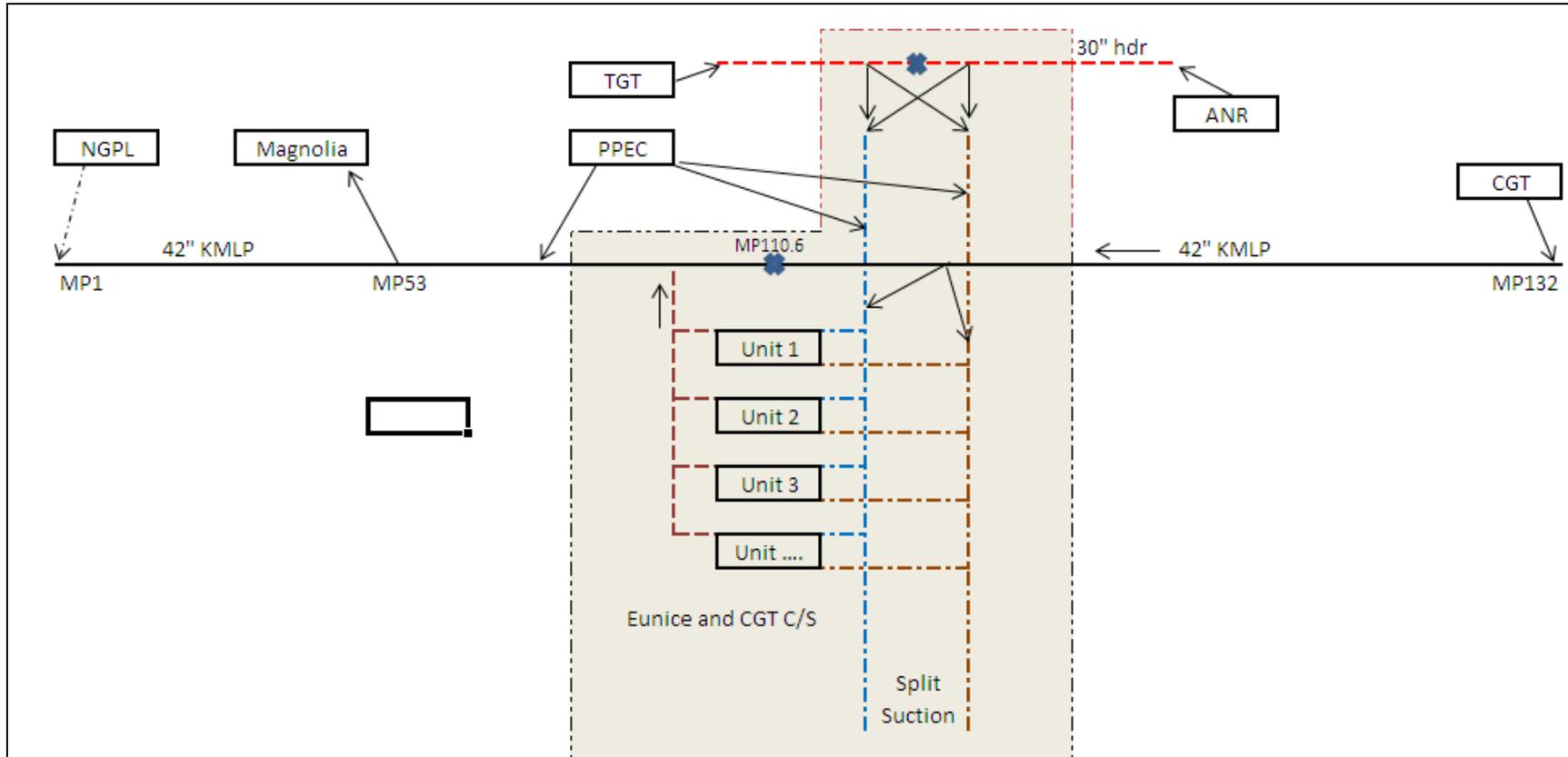


Figure 1.13-2 Schematic of Proposed Modifications to the Existing KMLP System at Eunice, Louisiana

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APPENDICES

- 1.A: USGS 7.5-Minute Series Topographic Maps
- 1.B: Aerial Photograph of Project
- 1.C: Real Estate Lease Option Agreements
 - 1.C.1 Port District Option Agreement
 - 1.C.2 BG LNG Option Agreement
 - 1.C.3 Amendment to the Port District Option Agreement
- 1.D: Project Schedule
- 1.E: Permits and Approvals for the Project
- 1.F: List of Landowners for the Project *[PRIVILEGED]*
- 1.G: Federal, State, Local, and Business Stakeholders

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Appendix 1.A
USGS 7.5-Minute Series Topographic Map

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Appendix 1.B
Aerial Photograph of the Project

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Appendix 1.C
Real Estate Lease Option Agreements

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Appendix 1.C Real Estate Lease Option Agreements

On March 6, 2013, Magnolia signed an exclusive and binding four-year Real Estate Lease Option Agreement with the Lake Charles Harbor & Terminal District (the Port District) for approximately 107.59 acres of the approximately 115-acre Project site (Port District Option Agreement; see Appendix 1.C.1). The Port District Option Agreement includes a clause for a 30-year-term ground lease option with the right to extend the lease term for four periods of 10 years each, or 70 years in total. Subject to compliance with the terms of the Port District Option Agreement, Magnolia may exercise the option and enter into the ground lease with the Port District at any time.

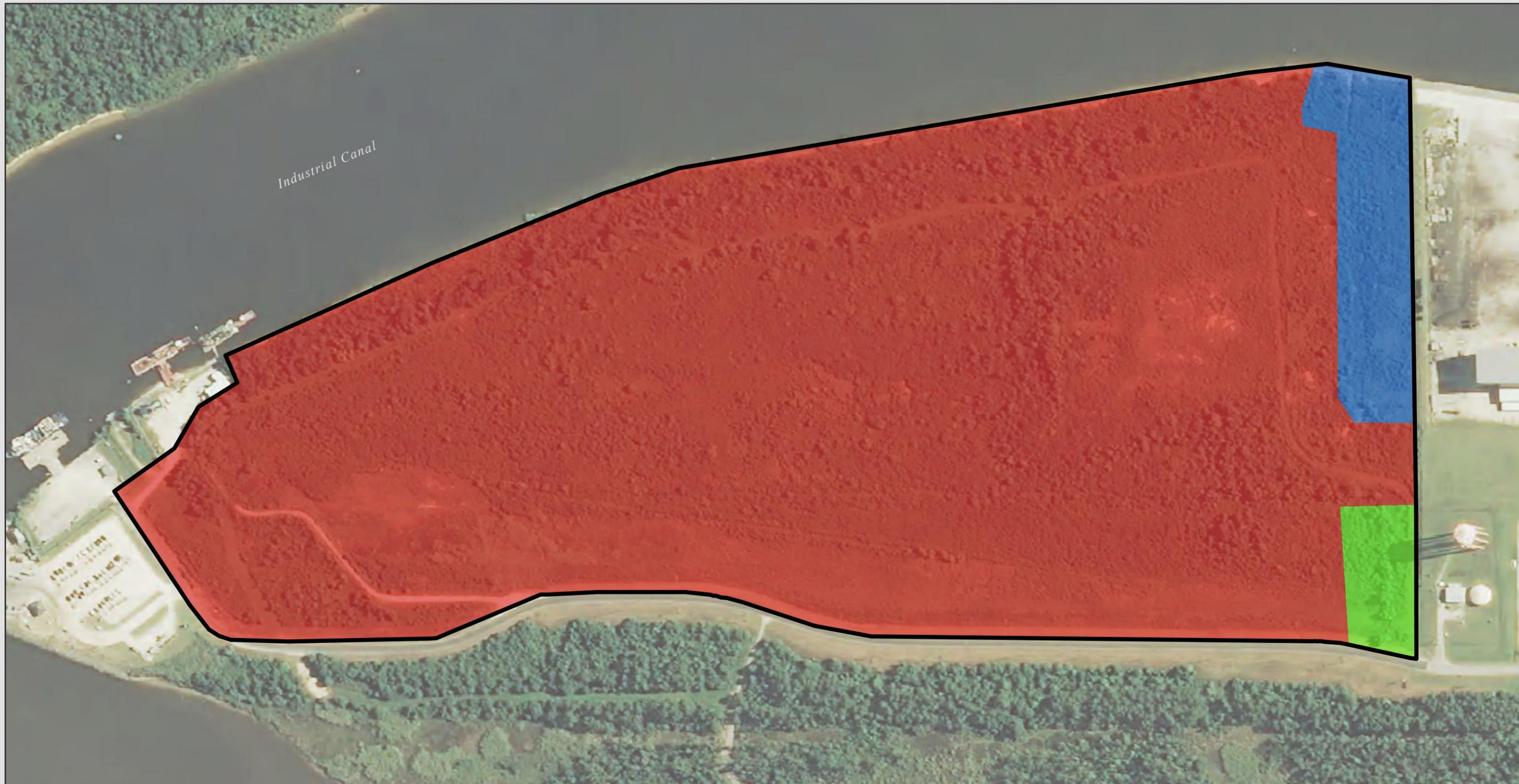
On September 26, 2013, Magnolia signed an exclusive and binding four-year Real Estate Lease Option Agreement with BG LNG Services, LLC (BG LNG) for approximately 5.74 acres of the approximately 115-acre Project site (BG LNG Option Agreement; see Appendix 1.C.2). The BG LNG Option Agreement includes a clause for a sublease option for an initial term expiring on December 31, 2022, with the right to extend the lease term for six periods of 10 years each. Subject to compliance with the terms of the BG LNG Option Agreement, Magnolia may exercise the option to enter into the sublease with BG LNG at any time.

On October 21, 2013, Magnolia signed the First Amendment to the Real Estate Lease Option Agreement with the Port District (First Amendment to the Port District Option Agreement; see Appendix 1.C.3). The First Amendment to the Port District Option Agreement deletes Exhibit 1 of the Port District Option Agreement, which provides the legal definition of the Project site, and substitutes a new Exhibit 1, which restates the initial definition of the Project site included in the Port District Option Agreement and adds an additional area of approximately 1.99 acres. The remaining provisions of the Port District Option Agreement remain in full force and effect and are unamended by the First Amendment to the Port District Option Agreement. Accordingly, the provisions of the Port District Option Agreement now cover approximately 109.58 acres of the approximately 115-acre Project Site.

Through the combination of the Port District Option Agreement, the First Amendment to the Port District Option Agreement, and the BG LNG Option Agreement, Magnolia will have control of the entire area comprising the approximately 115-acre Project site for at least the minimum expected operational life of the Project, which is 30 years.

Figure 1.C-1 shows the boundary of the lease areas described in these agreements, which is the entire Project site.

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**Figure 1.C-1
Port Lease Plan**

Magnolia LNG
Calcasieu Parish, Louisiana

Legend

 Magnolia LNG Project site boundary

 Real Estate Lease Option Agreement with Lake Charles Harbor & Terminal District – Signed March 6, 2013 (approximately 107.59 acres)

 Real Estate Lease Option Agreement with BG LNG Services, LLC – Signed On September 26, 2013 (approximately 5.74 acres)

 Amendment to Real Estate Lease Option Agreement with Lake Charles Harbor & Terminal District – Signed October 21, 2013 (approximately 1.99 acres)



**MAGNOLIA
LNG**

0 200 400 Feet
1:3,500

Source- MSI 2013, NAIP 2013
Image Date- 08/27/2013
Date: 4/7/2014

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Appendix 1.C.1

Port District Option Agreement

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REAL ESTATE LEASE OPTION AGREEMENT

BE IT KNOWN, that on the dates hereinafter set forth, before the undersigned Notaries Public, duly commissioned and qualified in and for their respective State and County/Parish, and in the presence of the undersigned competent witnesses personally came and appeared:

MAGNOLIA LNG, LLC ("PROJECT COMPANY"), a Delaware limited liability company with its principal business office located at 5 Ord Street, West Perth, Western Australia 6005, and with its registered office in Louisiana at 5615 Corporate Blvd, Suite 400B, Baton Rouge, LA 70808, herein represented by its duly authorized undersigned representative; and

LAKE CHARLES HARBOR & TERMINAL DISTRICT ("DISTRICT"), a political subdivision of the State of Louisiana, herein represented by its duly authorized Executive Director, with its principal business office located in Calcasieu Parish, Louisiana at 751 Bayou Pines East, Suite P, Lake Charles, Louisiana 70601;

which hereinafter collectively declare that:

WITNESSETH:

WHEREAS, the DISTRICT is a deep-water port and political subdivision of the State of Louisiana (the "State") exercising governmental powers of the State as delegated and authorized pursuant to the Louisiana Constitution and other statutory supplemental authorities thereof, acting by and through the Executive Director of the DISTRICT, having its office and domicile at 751 Bayou Pines East, Suite P, Lake Charles, Louisiana;

WHEREAS, the PROJECT COMPANY has determined that DISTRICT-owned land along the south side of the Industrial Canal is needed for and essential to the construction, operation and maintenance of a liquefied natural gas processing and export facility ("the Facility"); such lands (the "Project Site") being described on Exhibit 1 attached hereto; and

WHEREAS, in an effort to realize its objective of promoting the economic development and creation of jobs in the greater Lake Charles area, the DISTRICT has decided to enter into this Real Estate Lease Option Agreement (this “Option Agreement”) to give PROJECT COMPANY the opportunity to assess the Project Site for purposes of locating, constructing, operating and maintaining the Facility, and any other facilities related to the operations of the PROJECT COMPANY as described above (collectively, the “Project”).

NOW, THEREFORE, in consideration of the above recitals and the mutual covenants hereinafter contained, the parties herein covenant and agree as follows:

AGREEMENT

1. **PARTIES.** This Option Agreement is between the DISTRICT and PROJECT COMPANY on the terms and conditions hereinafter set forth, to-wit:

2. **IRREVOCABLE AND EXCLUSIVE OPTION TO LEASE.**

A. **Initial Option Period.** For and in consideration of an option payment in the amount of One Hundred Thousand and NO/100 (\$100,000.00) Dollars (the “Initial Option Payment”) and the mutual covenants hereinafter contained, the DISTRICT does hereby grant unto PROJECT COMPANY, or its assignee, an irrevocable and exclusive option (the “Option”) to lease the Project Site, on the terms and conditions set forth in the attached and annexed Ground Lease marked as Annex A (the “Ground Lease”). This Option is hereby granted to PROJECT COMPANY for a period of twelve (12) months from the Effective Date (as defined in Paragraph 21) (the “Initial Option Period”). The Initial Option Payment shall be payable to the DISTRICT not later than fifteen (15) calendar days after the Effective Date of this Option Agreement.

B. **First Extended Option Period.** The Initial Option Period shall be subject to an extension for up to twelve (12) months (the “First Extended Option Period”) for any reason that the PROJECT COMPANY deems necessary in its sole discretion. The right to extend the Initial Option Period for the First Extended Option Period may be exercised by PROJECT COMPANY in its sole discretion in accordance with Paragraph 5 below. If PROJECT COMPANY exercises its right to extend the Initial Option Period, then PROJECT COMPANY will make a payment to

DISTRICT in the amount of One Hundred Twenty-Five Thousand and NO/100 (\$125,000.00) Dollars for the First Extended Option Period (the “First Additional Option Payment”) not later than fifteen (15) calendar days after exercising such right in accordance with Paragraph 5 below.

C. Second Extended Option Period. The First Extended Option Period shall be subject to an extension for up to twelve (12) months (the “Second Extended Option Period”), for any reason that the PROJECT COMPANY deems necessary in its sole discretion. The right to extend the First Extended Option Period for the Second Extended Option Period may be exercised by PROJECT COMPANY in its sole discretion in accordance with Paragraph 5 below. If PROJECT COMPANY exercises its right to extend the First Extended Option Period, then PROJECT COMPANY will make a payment to DISTRICT in the amount of Two Hundred Thousand and NO/100 (\$200,000.00) Dollars for the Second Extended Option Period (the “Second Additional Option Payment”), not later than fifteen (15) calendar days after exercising such right in accordance with Paragraph 5 below.

D. Third Extended Option Period. The Second Extended Option Period shall be subject to an extension for up to twelve (12) months (the “Third Extended Option Period”), for any reason that the PROJECT COMPANY deems necessary in its sole discretion. The right to extend the Second Extended Option Period for the Third Extended Option Period may be exercised by PROJECT COMPANY in its sole discretion in accordance with Paragraph 5 below. If PROJECT COMPANY exercises its right to extend the Second Extended Option Period, then PROJECT COMPANY will make a payment to DISTRICT in the amount of Three Hundred Thousand and NO/100 (\$300,000.00) Dollars for the Third Extended Option Period (the “Third Additional Option Payment”), not later than fifteen (15) calendar days after exercising such right in accordance with Paragraph 5 below. However, if Project Company properly exercises this Option to Lease the Project Site, then, in that event, the DISTRICT shall grant a credit to PROJECT COMPANY of \$100,000.00 toward any rent due under the Ground lease.

E. Option Exercise. In order to exercise its Option to lease the Project Site, PROJECT COMPANY shall give written notice to the DISTRICT of its intention to lease the Project Site in accordance with the provisions of Paragraph 5. If PROJECT COMPANY fails to timely exercise its Option during the Initial Option Period, the First Extended Option Period, the

Second Extended Option Period, or Third Extended Option Period, as applicable, no further payments shall be due by PROJECT COMPANY and this Option Agreement shall be terminated and be of no further force or effect. If PROJECT COMPANY, after meeting all required conditions, timely exercises its Option, during the Initial Option Period or, if applicable, during the First Extended Option Period, the Second Extended Option Period or Third Extended Option Period, the parties shall execute and deliver the Ground Lease on or before the Closing Date (as defined in Paragraph 8.D herein). Except as provided for in Paragraph, 2.D, any Option Payments made by PROJECT COMPANY under the Option Agreement shall not be deemed or considered rent, rental, or any other consideration under the Ground Lease or used as a credit against any rent or other consideration due under the Ground Lease.

F. Cancellation of Option by Project Company. Notwithstanding anything to the contrary in this Option Agreement, the PROJECT COMPANY shall have the right at any time during the Initial Option Period or, if applicable, during the First Extended Option Period, the Second Extended Option Period or Third Extended Option Period, to cancel the Option at any time without any additional liability to the DISTRICT upon delivery of written notice to the DISTRICT of PROJECT COMPANY's desire to cancel the Option. Upon such cancellation of the Option by PROJECT COMPANY at any time, the Initial Option Payment and, if applicable, the First Additional Option Payment, the Second Additional Option Payment and the Third Additional Option Payment (collectively, the "Option Payments"), shall be non-refundable to PROJECT COMPANY, but no other payments shall be due by PROJECT COMPANY and this Option Agreement shall be terminated and be of no further force and effect.

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4. RENT CREDIT. Project Company shall not be entitled to any credit for the Option Payments against rent due under the Ground Lease, except as set forth in Paragraph 2D.

5. EXERCISE OF OPTION/EXTENDED OPTION PERIOD. The Option to lease the Project Site, or the right to extend the Initial Option Period, the First Extended Option Period or the Second Extended Option Period as set forth above, must be exercised in each case, if at all, by delivery of a written notice from PROJECT COMPANY to the DISTRICT in substantially

the form of Exhibit 2 with the appropriate blanks completed on or before the expiration of the Initial Option Period or the First Extended Option Period, Second Extended Option Period or Third Extended Option Period, as applicable. Failure to timely exercise the Option or the right to extend the Initial Option Period, First Extended Option Period or Second Extended Option Period shall automatically terminate the right of PROJECT COMPANY to exercise the Option or to extend the Initial Option Period or First Extended Option Period, as applicable.

6. CONSIDERATION FOR THE LEASE OF PROJECT SITE. If PROJECT COMPANY meets all required conditions and timely exercises its Option to lease the Project Site, the DISTRICT shall comply with all terms and conditions of this Option Agreement as hereinafter set forth to lease the Project Site to PROJECT COMPANY on the Closing Date for the consideration as stated in the Ground Lease and in accordance with the provisions of this Option Agreement and the Ground Lease.

7. PROJECT COMPANY'S RIGHTS AND DISTRICT'S OBLIGATIONS DURING THE OPTION PERIOD.

A. Access and Inspection; Early Works. At all times during this Option Agreement, PROJECT COMPANY shall, at its cost, have reasonable access to the Project Site for the purpose of determining the suitability of the Project Site and performing any and all other inspections, analyses, tests and other due diligence that PROJECT COMPANY deems necessary or desirable in its sole discretion, including, without limitation, (i) developing preliminary engineering, design and construction information relative to the facilities required to comprise and support the Project, (ii) performing site assessments of the Project Site by a contractor or contractors, including, without limitation, Phase I and Phase II environmental site assessments and any other environmental assessments that PROJECT COMPANY or any governmental entity regulating the Project deems necessary, (iii) performing engineering design, geotechnical, geophysical, seismic, archaeological and land surveys and assessments of and around the Project Site, (iv) performing tests and inspections of improvements, structures, wells, septic tanks, underground storage tanks, soils, geologic hazards, utility lines and systems located on or under, the Project Site, (v) conducting soil borings upon the Project Site, for purposes of analyzing such soils, (vi) interviewing persons familiar with the Project Site, (vii) coordinating design activities

with the DISTRICT; (viii) performing a land survey and title review, and (ix) any other actions or activities deemed by PROJECT COMPANY in its sole discretion to be necessary or desirable for PROJECT COMPANY to inspect, assess and establish the suitability of the Project Site or assess compliance with this Option Agreement (collectively, the “Project Site Activities”). Further, PROJECT COMPANY may have additional rights to undertake certain activities on the Project Site subject and in accordance with an “Early Works Agreement” which may be negotiated and agreed upon in the future between PROJECT COMPANY and the DISTRICT. The PROJECT COMPANY and its employees, agents, representatives, contractors and consultants shall have access to the Project Site, during the Initial Option Period and the First Extended Option Period, the Second Extended Option Period or Third Extended Option Period, as applicable, unless and until the date on which PROJECT COMPANY shall have entered into the Ground Lease, or the expiration or termination of this Option Agreement. After the full execution of the Ground Lease, PROJECT COMPANY shall have access to the Project Site pursuant to the terms of the Ground Lease.

B. Compliance with Laws; No Environmental Liability. PROJECT COMPANY shall take reasonable measures to ensure that its employees, agents, representatives, contractors and consultants, in conducting any Project Site Activities, comply with all applicable laws, rules, regulations, ordinances and decrees of any governmental body. The DISTRICT acknowledges and agrees that PROJECT COMPANY shall not incur any liability for any hazardous materials and/or substances, including, but not limited to, natural occurring radioactive material (“NORM”), asbestos, and polychlorinated biphenyls (“PCB”), existing on the Project Site, as of the Lease Commencement Date (as defined in the Ground Lease) and shall not incur any liability for discovery of such hazardous materials and/or substances.

C. Delivery of Copies of Reports by Project Company. Excluding any materials owned by third parties, proprietary information of the PROJECT COMPANY, materials subject to obligations of confidentiality or other restrictions or materials that cannot easily be separated from materials pertaining to property other than the Project Site, all reports, plans, maps, surveys, soil studies, soil reports, or such other similar information pertaining solely to the physical condition of the Project Site developed by PROJECT COMPANY or its employees, agents, representatives, contractors and/or consultants pursuant to the Project Site Activities prior

to the Closing Date or, if the Option is not exercised, prior to the expiration of this Option Agreement (“Data”) shall be provided to DISTRICT at no cost within thirty (30) calendar days following the Closing Date or, if the Option is not exercised, within thirty (30) calendar days following the expiration of the this Option Agreement. DISTRICT acknowledges and agrees that PROJECT COMPANY owns all such Data, subject to DISTRICT’s right to utilize such Data for any purpose without further consents or approval of PROJECT COMPANY.

D. Delivery of Diligence Materials by District. No later than thirty (30) calendar days after the Effective Date, the DISTRICT shall provide to PROJECT COMPANY, at the DISTRICT’s expense: (i) copies of any and all title insurance policies, title abstracts, title commitments, title exception documents and vesting deeds for the Project Site; (ii) copies of any surveys, environmental assessments, audits, test results or reports, wetland mitigation documentation, engineering studies or surveys and soil conditions reports or studies, within the DISTRICT’s possession or access or that of its attorneys, consultants, contractors and/or engineers; (iii) copies of any and all Governmental Approvals (as defined in Paragraph 7.E herein) that apply to or that the DISTRICT has obtained for the Project Site; (iv) copies of all contracts, leases, agreements, security agreements, servitudes, liens and obligations currently in effect relating to the Project Site; (v) copies of any documents relating to pending litigation, written threats of litigation, legal violations, zoning changes or development moratoriums, and (vi) copies of any other information the DISTRICT may have in its possession or control regarding the Project Site (collectively, “Project Site Materials”). The parties acknowledge and agree that the DISTRICT’s obligation to provide the Project Site Materials is on-going during this Option Agreement, to the extent that any such information becomes available to or is created by or for the DISTRICT following the Effective Date.

E. Governmental Approvals. The DISTRICT shall assist and support PROJECT COMPANY in its efforts to complete and obtain (i) all regulatory permits and approvals (including, without limitation, the issuance of any FERC permits, special use permits, building permits, zoning matters, environmental permits, and any other permits, approvals or ordinances deemed necessary or desirable by PROJECT COMPANY in its sole discretion in order to construct, develop and operate the Project on the Project Site (“Governmental Approvals”), and (ii) satisfactory results from the Project Site Activities. PROJECT COMPANY agrees to

diligently pursue obtaining all Governmental Approvals and satisfying all requirements in connection therewith. The DISTRICT agrees that PROJECT COMPANY shall have the authority to apply for all Governmental Approvals and to cooperate with PROJECT COMPANY in obtaining and satisfying the requirements of any necessary Governmental Approvals. No Governmental Approvals shall be binding on the DISTRICT or create any obligations to be fulfilled by the DISTRICT unless the DISTRICT specifically consents to be bound by such obligations.

F. Operation of Project Site During Option Period. After the Effective Date, DISTRICT and its employees, contractors and agents (i) shall maintain the Project Site in the same condition as it was on the Effective Date, reasonable wear and tear excepted, and otherwise operate and maintain the Project Site in the same manner as before the Effective Date, (ii) except in the case of an emergency, or to avert a potential emergency, shall not take any action and shall not permit any third party to take any action that would unduly interfere with the PROJECT COMPANY'S lawful Project Site Activities, (iii) shall not take any action and shall not cause any third party to take any action that would materially alter or affect the condition of the Project Site, including, but not limited to, by causing a casualty or introducing, releasing, storing or exacerbating any hazardous waste or hazardous substances, including, but not limited to, NORM, asbestos, and PCBs, upon, around or under any portion of the Project Site or into the ground water beneath or adjacent to the Project Site or the Calcasieu River Ship Channel, and (iv) shall comply with any notices of legal violations or court orders affecting the Project Site. If DISTRICT becomes aware prior to the Closing Date of any introduction, release, storage or exacerbation of any hazardous waste or hazardous substances, including, but not limited to, NORM, asbestos, and PCBs, upon, around or under any portion of the Project Site or into the ground water beneath or adjacent to the Project Site or the Calcasieu River Ship Channel, then DISTRICT shall notify PROJECT COMPANY in writing the earlier of (a) within fifteen (15) calendar days after DISTRICT becomes aware of the same or (b) prior to the Closing Date. If the DISTRICT violates this Paragraph 7.F, then the DISTRICT shall take all reasonable actions to cure or remedy such violation at its sole cost and expense. If the DISTRICT is unable to cure or remedy such violation by the Closing Date, then PROJECT COMPANY shall have the option in its sole discretion (to be exercised in a written notice delivered to the DISTRICT) to: (a) grant the DISTRICT additional time within which to cure the violation, and in such event the Closing

(as defined in Paragraph 8.D herein) shall be extended for such time necessary to cure the violation (in which case PROJECT COMPANY and the DISTRICT shall continue to have all of the rights and obligations set forth in this Option Agreement until the Closing); (b) elect not to enter into the Ground Lease, whereupon the DISTRICT shall immediately refund the aggregate Option Payments paid to the DISTRICT and the DISTRICT shall be liable to PROJECT COMPANY for PROJECT COMPANY's actual third party costs and expenses incurred in the due diligence and/or development of the Project Site, drafting and negotiating of this Option Agreement and the Ground Lease, and preparation of the Closing of the transaction contemplated by this Option Agreement (including, without limitation, all costs and expenses incurred in connection with the Project Site Activities); or (c) waive such violation and proceed to Closing as provided in Paragraph 8.D below.

G. Termination of Prior Letter Agreement. As of the Effective Date, the letter agreement entitled "Authorization for Field Study and Survey- PLC Tract- 475s, Lake Charles, LA" dated September 17, 2012, as amended, by and between the DISTRICT and Liquefied Natural Gas Limited, shall terminate.

8. **ADDITIONAL RIGHTS AND OBLIGATIONS PENDING EXERCISE OF LEASE OPTION.** During the Initial Option Period, First Extended Option Period, Second Extended Option Period and Third Extended Option Period, as applicable, the DISTRICT and PROJECT COMPANY hereby agree as follows:

A. Verification of Title and Survey.

(i) PROJECT COMPANY, at PROJECT COMPANY's expense, may obtain a title insurance commitment ("Title Commitment") to be issued by a title insurance company acceptable to PROJECT COMPANY in its sole discretion ("Title Company"), pursuant to which the Title Company shall commit to issue a 2006 ALTA extended coverage leasehold title insurance policy to PROJECT COMPANY ("Leasehold Title Policy") and a 2006 ALTA leasehold title loan insurance policy to any lender(s) of PROJECT COMPANY ("Lender Title Policy", and collectively with the Leasehold Title Policy, the "Title Policies"), each in forms and insurable amounts reasonably acceptable to PROJECT COMPANY and with such endorsements as PROJECT COMPANY may reasonably request. The Title Commitment shall show the

DISTRICT to be vested with good, marketable and complete ownership interest of the Project Site, subject only to the following matters (the “Permitted Exceptions”): ad valorem real estate taxes, if any are owed, for the current year and subsequent years, not yet due and payable; all applicable zoning ordinances and regulations; and such other matters as shall be satisfactory to PROJECT COMPANY, in PROJECT COMPANY’s sole discretion.

(ii) PROJECT COMPANY may obtain, at PROJECT COMPANY’s expense, a current staked ALTA/ACSM survey of the Project Site, complying with the most current Minimum Standard Detail Requirements for ALTA/ACSM Surveys and including any Table A items that PROJECT COMPANY may request in its sole discretion (“Survey”), prepared by a surveyor or engineer licensed in Louisiana with a certificate attached thereto executed by the surveyor in the form of the most current Minimum Standard Detail Requirements certificate for ALTA/ACSM surveys. The Survey shall reflect the boundaries of the Project Site and all improvements, servitudes, highways, pipeline, utility and other rights-of-way, flood zone classifications and other matters affecting or abutting the Project Site, and shall be in a form sufficient to induce the Title Company to delete all standard and printed exceptions contained in the Title Commitment.

(iii) PROJECT COMPANY shall have until sixty (60) calendar days prior to Closing (the “Title Review Period”) to notify the DISTRICT of any title defects, encumbrances, servitudes, use restrictions or other matters noted in the Title Commitment, the Survey, or elsewhere that PROJECT COMPANY requires to be removed or corrected prior to the execution and issuance of the Ground Lease (“Title Objections”).

(iv) The Title Commitment will show that all standard exceptions will be deleted from the Leasehold Title Policy (and from the Lender Title Policy, if PROJECT COMPANY has requested one), when issued, and that the “gap” will be deleted as of the Closing Date. If, within the Title Review Period, PROJECT COMPANY notifies the DISTRICT of any Title Objections, the DISTRICT shall use its diligent, good faith, best efforts to cure and eliminate the Title Objections (unless caused directly or indirectly by the PROJECT COMPANY) at the DISTRICT’s expense. The PROJECT COMPANY shall have the right to make additional requirements or objections as to title, up until the Closing Date, in the event any

title or survey update or endorsement to the Title Commitment discloses matters not shown in the Title Commitment or Survey (“Additional Title Objections” and together with the initial Title Objections, the “Title Objections”). As long as this Option Agreement remains in effect, the DISTRICT shall not convey all or any interest in the Project Site to any third party (an “Unauthorized Transfer”) and, without PROJECT COMPANY’s prior written consent in its sole discretion, the DISTRICT shall not grant or amend any lease, license, permit to use, servitude, lien, security interest or other encumbrance on the Project Site (an “Unauthorized Encumbrance”). If the DISTRICT is unable to cure the Title Objections, Unauthorized Transfer or Unauthorized Encumbrance by the Closing Date, PROJECT COMPANY shall have the option in its sole discretion (to be exercised in a written notice delivered to the DISTRICT) to: (a) grant the DISTRICT additional time within which to cure the Title Objections, Unauthorized Transfer or Unauthorized Encumbrance, and in such event the Closing shall be extended for such time necessary to cure the Title Objections, Unauthorized Transfer or Unauthorized Encumbrance (in which case PROJECT COMPANY and the DISTRICT shall continue to have all of the rights and obligations set forth in this Option Agreement until the Closing); (b) elect not to enter into the Ground Lease, whereupon the DISTRICT shall immediately refund the aggregate Option Payments paid to the DISTRICT and the parties will be relieved from further liability hereunder, unless the DISTRICT defaulted in its obligations under this Option Agreement (including, but not limited to, causing and failing to cure an Unauthorized Transfer or Unauthorized Encumbrance) or acted in a commercially unreasonable manner in not curing such Title Objections, in which event the DISTRICT shall be liable to PROJECT COMPANY for PROJECT COMPANY’s actual third party costs and expenses incurred in the due diligence and/or development of the Project Site; drafting and negotiating of this Option Agreement and preparation of the Closing of the transaction contemplated by this Option Agreement (including, without limitation, all costs and expenses incurred in connection with the Project Site Activities); or (c) waive one or more of the Title Objections, Unauthorized Transfers or Unauthorized Encumbrances (at which point such Title Objections, Unauthorized Transfer or Unauthorized Encumbrances will become Permitted Exceptions) and proceed to the Closing, as provided in Paragraph 8.D below.

(v) For purposes of clarification, if the Survey reflects encroachments, non-contiguity, overlaps, strips, gaps, rights-of-way or other encumbrances or interests on or in the

Project Site, or any other survey matters, or if the Project Site, consists of two or more parcels which are not contiguous along the entire length of their common boundary, such defects may also be raised as a Title Objection as described in Paragraph 8.A (iv) above.

B. District's Representations. The DISTRICT warrants, covenants and represents, during the term of this Option Agreement, the following to PROJECT COMPANY with full knowledge that PROJECT COMPANY is relying upon same in agreeing to enter into this Option Agreement:

(i) The DISTRICT owns the Project Site. The DISTRICT has the full power and authority to make, deliver, enter into and perform pursuant to the terms and conditions of this Option Agreement and to consummate the transactions described in this Option Agreement and the Ground Lease, and has taken all necessary action and proceedings to authorize the execution, delivery and performance of the terms and conditions of this Option Agreement and the Ground Lease. No further consent of any person or entity is required in connection with the execution and delivery of, or performance by the DISTRICT of its obligations under this Option Agreement and the Ground Lease.

(ii) This Option Agreement and the documents to be executed and delivered by the DISTRICT in connection with the consummation of this Option Agreement are (and when the Option is exercised and the Closing has occurred, the Ground Lease will be) valid, binding and enforceable in accordance with their respective terms and conditions.

(iii) The execution, delivery and performance by the DISTRICT of this Option Agreement and the Ground Lease are not precluded by, and will not violate, any provisions of any existing law, statute, rule or regulation in Louisiana or any judgment, order, decree, writ or injunction of any court, governmental department, commission, board, bureau or agency, and will not result in a breach of, or default under, any agreement, mortgage, contract, undertaking or other instrument or document to which the DISTRICT is a party or by which the DISTRICT is bound or to which the DISTRICT or any portion of the Project Site is subject.

(iv) No portion of the Project Site is presently being or, as of the Effective Date, previously has been acquired by any governmental authority in the exercise of its power to

condemn or to acquire through eminent domain or private purchase in lieu thereof nor are any of these proceedings or actions threatened, pending or imminent.

(v) There are no actions, suits or proceedings pending or to the DISTRICT's Knowledge (as defined in Paragraph 8.B(xii)), threatened against, by or affecting the DISTRICT in any court or before any government agency regarding the Project Site, including, but not limited to, any such actions, suits or proceedings relating to the ownership of, or the DISTRICT's ability to lease the Project Site or that would affect the value or use or development of the Project Site or the obligations of the DISTRICT to enter into and perform its obligations under this Option Agreement or the Ground Lease .

(vi) All work, labor, service and materials furnished prior to the Closing Date to or in connection with the Project Site and any improvements constructed on the Project Site prior to the Closing Date, will be discharged by the DISTRICT prior to the Closing Date, so that no mechanics', materialmen's or other lien, except those created by PROJECT COMPANY, its affiliates or contractors, may be filed against the Project Site or such improvements. The DISTRICT shall indemnify, defend and hold PROJECT COMPANY harmless from and against any liens affecting the Project Site that were not created by the PROJECT COMPANY and (a) relate to work, labor, services, or materials furnished prior to the Closing Date and (b) are not filed or perfected until after the Closing Date.

(vii) To the DISTRICT's Knowledge there are no parties other than the DISTRICT in possession of any portion of the Project Site, as lessees, tenants at sufferance, licensees, or trespassers, and no person or entity has any right or option to lease, purchase, occupy or possess all or any part of the Project Site.

(viii) The DISTRICT has not entered into any agreement, commitments or arrangements concerning the Project Site, or development thereof with any persons, including, but not limited to, governmental entities or agencies, councils, boards or other entities, adjoining landowners, utility companies or agencies other than PROJECT COMPANY.

(ix) The Project Site is not subject to assessment or collection of additional taxes for prior years based upon a change of land usage or ownership.

(x) To the DISTRICT's Knowledge, the DISTRICT has not manufactured, stored, released or located any hazardous waste or hazardous substances, including, but not limited to, NORM, asbestos, and PCBs, upon, around or under any portion of the Project Site or into any ground water beneath or adjacent to the Project Site or into the Calcasieu River Ship Channel, and the DISTRICT has received no warning notice, violation notice, complaint (judicial or administrative) or any other formal or informal notice alleging that the Project Site is not in compliance with any statute, ordinance, rule or regulation pertaining to hazardous waste or substances, including, but not limited to, NORM, asbestos, and PCBs. Except as disclosed by any reports provided to PROJECT COMPANY pursuant to Paragraph 7.D of this Option Agreement, to the DISTRICT's Knowledge (a) no hazardous waste or hazardous substances, including, but not limited to, NORM, asbestos, or PCBs, have been manufactured, stored, released or located upon or under any portion of the Project Site or into any ground water beneath or adjacent to the Project Site or into the Calcasieu River Ship Channel, (b) the Project Site has never been used to treat, store, release or dispose of waste materials or hazardous substances, including, but not limited to, NORM, asbestos, or PCBs; (c) there has not been and is no leaching or drainage of waste materials or hazardous substances, including, but not limited to, NORM, asbestos, or PCBs, into the ground water beneath or adjacent to the Project Site or into the Calcasieu River Ship Channel; and (d) there have not been and are not buried or semi-buried or otherwise placed tanks, storage vessels, drums or containers of any kind located on the Project Site.

(xi) The DISTRICT has received no notice from any governmental authority concerning the imposition or widening of any streets, roads or highways abutting the Project Site or widening of the shipping channel alongside the Project Site, or concerning the imposition of any special taxes or assessments against the Project Site. The DISTRICT has no knowledge of general plan, specific plan, zoning or other land use regulation proceedings or special assessment proceedings pending or threatened, with respect to the Project Site. The DISTRICT is not a party to any covenant or agreement to preserve or prevent a change in the existing zoning, land use designations, special use permits or entitlements of the Project Site.

(xii) Other than as set forth in this Option Agreement, the DISTRICT has not (a) entered into any agreement relating to the Project Site, nor (b) encumbered or granted any interest in the Project Site.

Each of the foregoing warranties, covenants and representations shall still be true and correct as of the Effective Date (except where specifically noted) and the Closing Date, shall survive the Closing Date and shall not be merged with or into the Ground Lease or any other related instrument of conveyance or transfer. The term “Knowledge” as used in this Paragraph 8.B shall mean what the DISTRICT knows or should reasonably know about the Project Site, and any other matters addressed by the warranties, covenants, and representations made herein.

C. Project Company’s Representations. The PROJECT COMPANY warrants, covenants and represents, during the term of this Option Agreement, the following to the DISTRICT, with full knowledge that the DISTRICT is relying upon same in agreeing to enter into this Option Agreement:

(i) The PROJECT COMPANY has the full power and authority to make, deliver, enter into and perform its obligations pursuant to the terms and conditions of this Option Agreement and has taken all necessary action and proceedings to authorize the execution, delivery and performance of the terms and conditions of this Option Agreement. No further consent of any person or entity is required in connection with the execution and delivery of, or performance by the PROJECT COMPANY of its obligations under this Option Agreement.

(ii) The execution, delivery and performance by the PROJECT COMPANY of this Option Agreement are not precluded by, and will not violate, any provisions of any existing law, statute, rule or regulation in Louisiana or any judgment, order, decree, writ or injunction of any court, governmental department, commission, board, bureau or agency, and will not result in a breach of, or default under, any agreement, mortgage, contract, undertaking or other instrument or document to which the PROJECT COMPANY is a party or by which the PROJECT COMPANY is bound or to which the PROJECT COMPANY is subject.

(iii) There are no actions, suits or proceedings pending or to the PROJECT COMPANY’s Knowledge (as defined in Paragraph 8.C(iv)), threatened against, by or affecting

the PROJECT COMPANY in any court or before any government agency regarding the Project Site, including, but not limited to, any such actions, suits or proceedings relating to the ownership of, or the PROJECT COMPANY's ability to lease the Project Site or that would materially affect the contemplated use or development of the Project Site or the obligations of the PROJECT COMPANY to perform its obligations under this Option Agreement.

(iv) All work, labor, service and materials furnished to the PROJECT COMPANY prior to the Closing Date to or in connection with the Project Site, will be discharged by the PROJECT COMPANY prior to the Closing Date, so that no mechanics', materialmen's or other lien, created by the PROJECT COMPANY, its affiliates or contractors, may be filed against the Project Site or such improvements. The PROJECT COMPANY shall indemnify, defend and hold DISTRICT harmless from and against any liens affecting the Project Site that were not created by the DISTRICT and (a) relate to work, labor, services, or materials furnished prior to the Closing Date at the request or direction of the PROJECT COMPANY and (b) are not filed or perfected until after the Closing Date.

Each of the foregoing warranties, covenants and representations shall still be true and correct as of the Effective Date (except where specifically noted) and the Closing Date, shall survive the Closing Date and shall not be merged with or into the Ground Lease or any other related instrument of conveyance or transfer. The term "Knowledge" as used in this Paragraph 8.C shall mean what the PROJECT COMPANY knows or should reasonably know about the matters addressed by the warranties, covenants and representations made herein.

D. Closing. The execution of the Ground Lease (the "Closing") shall take place as soon as practical following the PROJECT COMPANY's exercise of the Option as provided in Paragraph 5 above, but in no event shall the Closing take place later than fifteen (15) calendar days following such exercise, as may be extended by the extensions provided for in Paragraphs 7.F, 8.A and 8.G ("Closing Date"). Possession of the Project Site shall be delivered to PROJECT COMPANY or its assignee as of the Closing Date, free and clear of the rights and claims of any other party other than Permitted Exceptions; provided, however, that prior to the Closing Date, PROJECT COMPANY and its employees, agents, representatives, contractors and

consultants shall have the right to enter upon the Project Site at any and all times for purposes of any further inspections of the Project Site as provided in Paragraph 7 above.

E. Expenses of Closing. At Closing, the DISTRICT shall pay the costs of recording any documents or certificates or taking any other action required to be taken to correct title defects or remove any title encumbrances (including, without limitation, any Title Objections, Additional Title Objections, Unauthorized Transfers or Unauthorized Encumbrances). At Closing, PROJECT COMPANY shall pay the costs of recording an extract or memorandum of the Ground Lease (as provided in the Ground Lease) and for the Leasehold Title Policy (and the Lender Title Policy, if PROJECT COMPANY has requested one) issued pursuant to the Title Commitment. PROJECT COMPANY and the DISTRICT shall each pay the fees and expenses of their respective counsel incurred in connection with the negotiation, preparation and execution of this Option Agreement and the Ground Lease, and satisfying its respective obligations under this Option Agreement. PROJECT COMPANY and the DISTRICT shall each pay any brokerage, finder's fee or similar commission in connection with the option or lease of the Project Site arising from its actions. PROJECT COMPANY shall pay the cost of the Survey and the Leasehold Title Policy (and the Lender Title Policy, if PROJECT COMPANY has requested one).

F. Closing Documents.

(i) The DISTRICT shall deliver the following at Closing:

(a) Fully executed and signed Ground Lease in substantially the form attached hereto as Annex A.

(b) Gap, mechanic's lien and possession affidavit(s) in forms sufficient to cause the Title Company to issue the Leasehold Title Policy (and the Lender Title Policy, if PROJECT COMPANY has requested one), without the applicable standard title policy exceptions.

(c) Resolution by the Board of Commissioners of the DISTRICT, authorizing the execution of the Ground Lease and the transactions and documents contemplated

by this Option Agreement and the Ground Lease in the form required by applicable laws and regulations and the DISTRICT's by-laws.

(d) Possession of the Project Site.

(ii) At Closing, PROJECT COMPANY shall:

(a) Deliver a certified copy of a resolution of the members or managers of PROJECT COMPANY (as required by the operating agreement of PROJECT COMPANY), authorizing the execution of the Ground Lease, and all other documents necessary to effect the valid execution of the Ground Lease.

(b) Cause the execution and delivery of the Ground Lease by a duly authorized officer of PROJECT COMPANY.

G. Conditions Precedent for Project Company to Close. The following are conditions precedent to PROJECT COMPANY's obligations at Closing, including execution of the Ground Lease:

(i) As of the Closing Date, all of the DISTRICT's representations and warranties contained in Paragraph 8.B hereof shall be true and correct.

(ii) The DISTRICT shall have performed all of its obligations under this Option Agreement.

(iii) The DISTRICT's interest in the Project Site shall be (and the DISTRICT hereby warrants and represents to PROJECT COMPANY that the same is) good, merchantable, marketable and free and clear of any liens, encumbrances, highways, rights-of-way, servitudes, licenses, restrictions, leases, agreements, covenants, conditions and limitations, except the Permitted Exceptions. The DISTRICT's title shall also be total and complete and not subject to any outstanding or contingent liens or claims of an undivided interest therein and PROJECT COMPANY shall have received the Survey and an irrevocable written commitment of the Title Company to issue the Leasehold Title Policy (and the Lender Title Policy, if PROJECT COMPANY has requested one), each in form and substance acceptable to PROJECT COMPANY.

(iv) There are no pending, threatened or existing moratoriums or governmental regulations, statutes, proceedings or actions pending, threatened or existing against the DISTRICT, the Project or the Project Site before any court or governmental agency or authority that would prohibit or inhibit PROJECT COMPANY from obtaining utility service, building permits or development approvals, or which would prevent, prohibit, delay or inhibit the construction, development and operation of the Project on the Project Site.

(v) Subsequent final geotechnical investigation does not necessitate any substantial revision to the type of structural design contemplated by the preliminary investigation conducted by or on behalf of PROJECT COMPANY.

(vi) PROJECT COMPANY shall have obtained Final Approval (as hereinafter defined) with respect to all Governmental Approvals, free of any unreasonable or extraordinary conditions imposed by the issuing entity upon the issuance of such Final Approvals (provided that PROJECT COMPANY has used its commercially reasonable efforts to pursue in good faith the necessary Final Approvals). "Final Approval" shall be the date when: (a) all of the Governmental Approvals have been approved and issued, in forms and with conditions satisfactory to PROJECT COMPANY; (b) the time has passed for appeal of all Governmental Approvals; and (c) any appeals or litigation with respect to clause (b) above have been prosecuted and fully and finally resolved in a manner satisfactory to PROJECT COMPANY. If the PROJECT COMPANY exercises the Option but fails to execute the Ground Lease through no fault of the DISTRICT, in addition to forfeiting the aggregate Option Payments paid, the PROJECT COMPANY shall be liable to the DISTRICT for the DISTRICT's actual third party costs and expenses incurred in preparation of the Closing as contemplated by this Option Agreement.

(vii) There shall have been no material change in the condition of the Project Site from the condition in which the Project Site existed as of the date that PROJECT COMPANY exercised the Option without PROJECT COMPANY's prior written consent.

(viii) DISTRICT shall not be in default of any other existing agreement with the PROJECT COMPANY ("Existing Agreements"), after notice and beyond any applicable cure period.

In the event that after PROJECT COMPANY's exercise of the Option, any of the conditions precedent to PROJECT COMPANY's obligation to lease the Project Site are not satisfied as of the Closing Date or not waived by PROJECT COMPANY or it is reasonably determined prior to the Closing Date that such conditions cannot be fulfilled or satisfied and the same are not waived by PROJECT COMPANY, then, at the sole option of PROJECT COMPANY (to be exercised in PROJECT COMPANY's sole discretion by delivery of written notice to DISTRICT): (i) PROJECT COMPANY may elect not to enter into the Ground Lease and this Option Agreement shall be terminated and all parties shall be relieved of any further obligations hereunder; whereupon the DISTRICT shall not be obligated to refund any of the Option Payments, except to the extent that the failure to fulfill or satisfy a condition results from DISTRICT's default under this Option Agreement with respect to its obligations described herein, in which case the DISTRICT shall be obligated to return the aggregate Option Payments paid by the PROJECT COMPANY and shall be liable for PROJECT COMPANY's actual third party costs and expenses incurred in the due diligence and/or development of the Project Site, drafting and negotiating of this Option Agreement and the Ground Lease, and preparation of the Closing of the transaction contemplated by this Option Agreement (including, without limitation, all costs and expenses incurred in connection with the Project Site Activities), or (ii) PROJECT COMPANY may, at its option and at no cost to the PROJECT COMPANY, extend up to three hundred sixty-five (365) days the Closing or for such period as is reasonably necessary to satisfy all of the conditions precedent to PROJECT COMPANY's obligation to proceed with the Closing.

H. Conditions Precedent for the District to Close. The following are conditions precedent to the DISTRICT's obligations at Closing, including execution of the Ground Lease:

(i) As of the Closing Date, all of the PROJECT COMPANY's representations and warranties contained in Paragraph 8.C hereof shall be true and correct in all material respects.

(ii) PROJECT COMPANY shall not be in default of any other Existing Agreement with the DISTRICT, after notice and beyond any applicable cure period.

(iii) PROJECT COMPANY shall have performed all of its obligations under this Option Agreement.

In the event that after PROJECT COMPANY's exercise of the Option, any of the conditions to DISTRICT's obligation to lease the Project Site are not satisfied as of the Closing Date or not waived by the DISTRICT, and the non-fulfillment or satisfaction of such conditions was not caused by the DISTRICT, in whole or in part, or it is reasonably determined prior to the Closing Date that such conditions cannot be fulfilled or satisfied and the same are not waived by the DISTRICT, then, at the sole option of the DISTRICT (to be exercised in the DISTRICT's sole discretion by delivery of written notice to PROJECT COMPANY): (i) the DISTRICT may elect not to enter into the Ground Lease and this Option Agreement shall be terminated and all parties shall be relieved of any further obligations hereunder; whereupon the DISTRICT shall not be obligated to refund any of the Option Payments. To the extent that the failure of such condition results from PROJECT COMPANY's default under this Option Agreement with respect to its obligations described herein, or any material obligation under any Existing Agreement with respect to its obligations described therein, the PROJECT COMPANY shall be liable for the DISTRICT's actual third party costs and expenses in drafting and negotiating of this Option Agreement and the Ground Lease, and preparation of the Closing of the transaction contemplated by this Option Agreement, or (ii) the DISTRICT may, with the PROJECT COMPANY'S written consent, extend up to three hundred sixty-five (365) days the Closing or for such period as is reasonably necessary to satisfy all of the conditions precedent to the DISTRICT's obligation to proceed with Closing, in exchange for which PROJECT COMPANY shall pay the DISTRICT One Hundred Fifty Thousand and NO/100 (\$150,000.00) Dollars, prorated for the period of such extension.

I. Mutual Indemnification. The PROJECT COMPANY agrees to indemnify, defend and hold the DISTRICT and the DISTRICT's officers and directors harmless from and against any and all claims, actions, damages, liabilities and expenses (including, without limitation, reasonable attorneys' fees and expenses) resulting from any occurrence on the Project Site during the term of this Option Agreement and arising from any act or omission of PROJECT COMPANY or the PROJECT COMPANY's employees, agents, representatives, contractors or consultants, except to the extent that any of the same arise from or out of the negligence or

willful misconduct of the DISTRICT or the DISTRICT's employees, agents, representatives, contractors or consultants. The DISTRICT agrees to indemnify, defend and hold the PROJECT COMPANY and the PROJECT COMPANY's officers, directors, managers, and members harmless from and against any and all claims, actions, damages, liabilities and expenses (including, without limitation, reasonable attorneys' fees and expenses) resulting from any occurrence on the Project Site during the term of this Option Agreement and arising from any act or omission of the DISTRICT or the DISTRICT's employees, agents, representatives, contractors or consultants, except to the extent that any of the same arise from or out of the negligence or willful misconduct of the PROJECT COMPANY or the PROJECT COMPANY's employees, agents, representatives, contractors or consultants.

9. Intentionally left blank.

10. SUCCESSORS AND ASSIGNS. This Option Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective successors and lawful assigns. However, this Option Agreement may not be assigned or transferred by PROJECT COMPANY to any other person or entity without the consent of the DISTRICT, which consent shall not be unreasonably withheld, delayed or conditioned; provided that if PROJECT COMPANY is not in default after notice and beyond any applicable cure period under this Option Agreement or any material obligation under an Existing Agreement, PROJECT COMPANY may assign this Option Agreement in its entirety without the DISTRICT's prior consent to (i) an Affiliate or (ii) a successor in interest in connection with a merger, acquisition or sale of all or substantially all of PROJECT COMPANY's assets or membership interests of PROJECT COMPANY, (iii) as collateral in connection with a financing, or (iv) any person to whom PROJECT COMPANY is permitted to assign the Option Agreement. "Affiliate" shall mean an entity that controls, is controlled by or is under common control with the PROJECT COMPANY, where "control" mean means the ownership directly or indirectly of more than fifty percent (50%) of the voting rights in a company or other legal entity or the ability to directly or indirectly appoint a majority of the directors in a company or other legal entity.

11. NOTICES. All notices required or allowed by this Option Agreement shall be delivered by email (with a requirement that such electronic notice shall be followed within three (3)

calendar days by written notice delivered in one of other manners permitted in this paragraph), third party overnight courier (including overnight courier services such as Federal Express) or by certified mail, return receipt requested, postage prepaid, addressed to the party to whom notice is to be given, at the following addresses:

If to PROJECT COMPANY: Magnolia LNG, LLC
616 Broad Street
P.O. Box 3759 (70602)
Lake Charles, LA 70601
Attention: Company Secretary
Email: dgardner@lnglimited.com.au

with a copy to: Winfield E. Little, Jr.
616 Broad Street
P.O. Box 3759 (70602)
Lake Charles, LA 70601
Email: wlittle@littlelawfirm.com

and

Chad Mills
Sutherland Asbill & Brennan LLP
1001 Fannin Street, Suite 3700
Houston, TX 77002-6760
Email: chad.mills@sutherland.com

If to the DISTRICT: Lake Charles Harbor & Terminal District
751 Bayou Pines East, Suite P
Lake Charles, LA 70601
Attention: Executive Director
Email: brase@portlc.com

With a copy to: General Counsel
Lake Charles Harbor & Terminal District
751 Bayou Pines East, Suite P
Lake Charles, LA 70601
Email: mdees@portlc.com

Notice shall be deemed to have been given upon receipt by recipient (provided that any notice by email shall have been followed within three (3) calendar days by written notice delivered in one of the other manners permitted under this paragraph), by the overnight courier airbill or by the

return receipt. In the event that the recipient fails or refuses to sign the return receipt for delivery by certified mail, the receipt shall be sufficient.

12. DEFAULT. In the event of a default by the DISTRICT with respect to any of its obligations hereunder, including the satisfaction of all conditions precedent or any breach or misrepresentation by the DISTRICT of any warranties, representations and covenants made by the DISTRICT in Paragraph 8.B, PROJECT COMPANY shall, except as otherwise provided for herein, be entitled to the right of specific performance against the DISTRICT together with the recovery of all expenses incurred in obtaining specific performance, including reasonable attorney's fees and all costs of court or, at PROJECT COMPANY's sole election, PROJECT COMPANY shall be entitled to terminate this Option Agreement and the DISTRICT shall immediately return all Option Payments previously paid by PROJECT COMPANY as liquidated damages and shall be liable for PROJECT COMPANY's actual third party costs and expenses incurred in the due diligence and/or development of the Project Site, drafting and negotiating of this Option Agreement and the Ground Lease, and preparation of the Closing of the transaction contemplated by this Agreement (including, without limitation, all costs and expenses incurred in connection with the Project Site Activities) and PROJECT COMPANY may exercise any other rights or remedies available at law or in equity. For the avoidance of doubt, this is in addition to any rights for the return of the Option Payments that the PROJECT COMPANY may have under this Option Agreement.

13. EMINENT DOMAIN/CASUALTY. If, during the term of this Option Agreement, there is any taking of any portion of the Project Site by eminent domain or condemnation, then the DISTRICT shall promptly deliver written notice thereto of the PROJECT COMPANY, and if the PROJECT COMPANY determines that such taking will materially affect the Project Site for the development, construction, maintenance or operation of the Project, in PROJECT COMPANY's reasonable determination, PROJECT COMPANY may, at its option (to be exercised in PROJECT COMPANY's sole discretion by delivery of written notice to the DISTRICT), terminate this Option Agreement or elect to not enter into the Ground Lease (if PROJECT COMPANY has already exercised the Option), whereupon the DISTRICT shall immediately refund the aggregate Option Payments paid to the DISTRICT and the parties will be relieved from further liability hereunder. In the event that the Project Site is rendered, at any

time during the term of this Option Agreement or prior to the Closing, in PROJECT COMPANY's sole determination, permanently unsuitable for the development, construction, maintenance or operation of the Project as a result of a casualty event (including any hurricane, named storm, flood or tornado) or Force Majeure (as hereinafter defined) event occurring in and around Calcasieu Parish, Louisiana, then PROJECT COMPANY may, at its option (to be exercised in PROJECT COMPANY's sole discretion by delivery of written notice to the DISTRICT), terminate this Option Agreement or elect to not enter into the Ground Lease (if PROJECT COMPANY has already exercised the Option), whereupon the DISTRICT shall immediately refund the aggregate Option Payments paid to the DISTRICT and the parties will be relieved from further liability hereunder.

14. ENTIRE AGREEMENT. This Option Agreement constitutes the entire agreement of the parties with respect to subject matter hereof. All understandings and agreements heretofore between the parties hereto with respect to the subject matter hereof are merged in this Option Agreement which alone fully and completely expresses their understanding.

15. ATTORNEY'S FEES. In connection with any litigation concerning this Option Agreement, the prevailing party shall be entitled to recover all of its costs, expenses and reasonable attorney's fees from the non-prevailing party.

16. NO WAIVER. No waiver of any provision of this Option Agreement shall be effective unless it is in writing and signed by the party against whom it is asserted; and any such written waiver shall only be applicable to the specific instance to which it relates and shall not be deemed to be a continuing or future waiver.

17. AMENDMENTS. This Option Agreement may not be amended, modified, altered or changed in any respect whatsoever except by further agreement in writing and duly executed by the parties hereto.

18. GOVERNING LAW. This Option Agreement shall be governed in its enforcement, construction and interpretation by the laws of the State of Louisiana. In the event that either party must file suit as a result of a default on the part of the other, such suit shall be filed in a state court of competent jurisdiction in the Fourteenth Judicial District Court, State of Louisiana,

unless the default of dispute implicates or involves a federal statute, regulation, order, or permit, in which case venue shall be in the federal courts for the Western District of Louisiana.

19. **COUNTERPARTS; HEADINGS; TIME OF THE ESSENCE.** This Option Agreement may be executed in counterparts by the parties hereto and each of which shall be deemed an original but all of which taken together shall constitute but one and the same instrument. The paragraph captions and headings contained in this Option Agreement are included herein for convenience of reference only and shall not be considered a part hereof and are not in any way intended to define, limit or enlarge the terms hereof. Time shall be of the essence for each and every provision of this Option Agreement of which time is an element.

20. **RECORDING.** This Option Agreement shall not be recorded in the public records, provided, however, that the DISTRICT shall execute, acknowledge and deliver to PROJECT COMPANY a memorandum of this Option Agreement in recordable form prepared by PROJECT COMPANY, which may be recorded by PROJECT COMPANY in the conveyance records of Calcasieu Parish, Louisiana.

21. **EFFECTIVE DATE.** The effective date of this Option Agreement (“Effective Date”) shall be the last date that the DISTRICT or PROJECT COMPANY executes this Option Agreement.

22. **REAL ESTATE COMMISSION.** The DISTRICT and PROJECT COMPANY each represent to the other party that they have dealt with no brokers in connection with the negotiation, execution and/or delivery of this Option Agreement or the Ground Lease, and no party is entitled to any broker’s commission, finder’s fee or similar payment with respect to this Option Agreement or the Ground Lease arising from the representing party’s actions. If any other person shall assert a claim to a finder’s fee, brokerage commission or other compensation on account of alleged employment as finder or broker in connection with this transaction, the party against whom the purported finder or broker is claiming shall indemnify, defend and hold the other party harmless from and against any such claim and any and all costs, expenses and liabilities incurred in connection with such claim or any action or proceeding brought thereon, including, but not limited to, reasonable attorney’s fees and court costs in defending such claim.

23. FORCE MAJEURE. Notwithstanding any other provision of this Option Agreement, provided that notice is given within thirty (30) calendar days of an occurrence of an event of Force Majeure (as hereinafter defined) by the party hereto seeking to invoke and utilize the provisions of this Paragraph 23, such party shall be excused from performing any of its respective obligations or undertakings required hereunder for so long as the performance of such obligations are prevented or significantly delayed, retarded or hindered by any event of Force Majeure, provide that an event of Force Majeure shall not excuse any party from making any payment of money required under this Option Agreement. As used in this Paragraph, “Force Majeure” means any cause not reasonably within the control of the party claiming suspension, and shall include, but not be limited to, the following: (i) physical events such as acts of God, landslides, lightning, earthquakes, fires, storms, hurricanes, droughts, floods, washouts, or explosions, (ii) weather related events affecting an entire geographic region; (iii) acts of others such as strikes, lockouts or other industrial disturbances, riots, sabotage, terrorism, insurrections, civil disturbance or wars; provided that the settlement of strikes, lockouts or other industrial disturbances shall be within the sole discretion of the party claiming such suspension; (iv) the failure or interruption of performance by PROJECT COMPANY’s engineering, procurement and construction contractors or any subcontractors of such contractor to the extent caused by an event of Force Majeure; or (v) the failure or interruption of performance by PROJECT COMPANY’s suppliers by reason of such supplier’s valid declaration of an event that would constitute an event of force majeure under PROJECT COMPANY’s contract with such supplier; or (vi) governmental actions such as necessity for compliance with any court order, law, statute, ordinance, regulation or policy having the effect of law promulgated by a governmental authority having jurisdiction, or that restrict PROJECT COMPANY’s ability to construct the Project or any delay in issuance or effectiveness of any Governmental Approval that has been properly applied for by PROJECT COMPANY that is required to construct the Project.

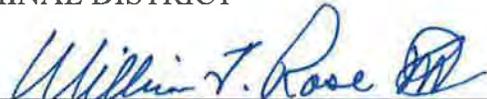
[Signatures on Following Pages]

THUS DONE AND SIGNED by the DISTRICT at Lake Charles, Louisiana, in the presence of the undersigned competent witnesses and me, Notary, on this 6th day of March, 2013.

WITNESSES:


Print Name: Walter M. Sanchez

LAKE CHARLES HARBOR &
TERMINAL DISTRICT

By: 
William J. Rase, III, Executive Director


Print Name: John LeBlanc

Approved By:


Michael K. Dees, General Counsel

BEFORE ME: 
Notary Public

My Commission expires: at my death

Winfield Eud Little Sr FT 08630

THUS DONE AND SIGNED by MAGNOLIA LNG, LLC at Lake Charles, Louisiana in the presence of the undersigned competent witnesses and me, Notary, on this 6th day of March, 2013.

WITNESSES:

MAGNOLIA LNG, LLC

Ginger E. Adam
Print Name: GINGER E. ADAM

By: [Signature]
Name: Fletcher Maurice Brand
Title: Managing Director

Judy McCleary
Print Name: Judy McCleary

BEFORE ME: [Signature]
Notary Public

My Commission expires: at 7 death
Winfield End little bit 08/30

ANNEX A

(Form of "Ground Lease")

ANNEX A

STATE OF LOUISIANA

PARISH OF CALCASIEU

GROUND LEASE

THIS GROUND LEASE (hereinafter "Lease") is made and entered into, and is effective, as of _____, 20__ ("Lease Commencement Date") by and between the LAKE CHARLES HARBOR AND TERMINAL DISTRICT, a political subdivision of the State of Louisiana (hereinafter "the District" or "LESSOR"), and MAGNOLIA LNG, LLC, a limited liability company organized and existing under the laws of the State of Delaware (hereinafter "LESSEE").

WHEREAS, LESSOR and LESSEE desire to enter into a lease agreement on certain terms and conditions as set forth in this Lease.

THEREFORE, LESSOR and LESSEE agree as follows:

* * * * *

KNOW ALL MEN BY THESE PRESENTS: That,

LESSOR for and in consideration of the annual rentals herein specified and other good and valuable consideration, the sufficiency of which is hereby acknowledged, does hereby rent, let, and lease unto LESSEE, all that certain tract or parcel of land containing ___ acres, more or less, being more particularly described as set forth on Exhibit A hereto (hereinafter "Leased Premises"). In connection with the permitted uses of the Leased Premises as provided for in Sections 3 and 4 below or as otherwise provided for herein and only if LESSOR is in full compliance with the terms and conditions provided for herein, LESSEE may also use the bottoms of the Industrial Canal adjacent or near the Leased Premises to the extent such use is allowed by applicable law and in accordance with all the rules and regulations of the State of Louisiana, the United States of America and the general rules and regulations of general applicability of LESSOR, including, but not limited to, Tariff No. 013 of the Lake Charles Harbor and Terminal District, as it may be amended from time to time.

1. Term.

(a) Term. The term of this Lease shall be the period commencing on the Lease Commencement Date and expiring thirty (30) years from the Lease Commencement Date (the "Expiration Date"), herein sometimes referred to as the "Initial Term", subject to four (4) options to extend the term of this Lease on the same terms and conditions ("Renewal Options") for additional periods of ten (10) years each ("Renewal Term" or "Renewal Terms").

(b) Exercise of Renewal Options. The Renewal Options shall be exercisable only by LESSEE, in its sole discretion, by delivery of written notice to LESSOR no later than six (6) months prior to the expiration of the Expiration Date or the then current Renewal Term, as applicable, provided that as of the giving of such notice LESSEE is not in default under this

Lease beyond applicable notice and cure periods. The failure of LESEE to exercise any Renewal Option for any Renewal Term in accordance with the terms of this section 1 (b) shall terminate such Renewal Options for such Renewal Terms, unless otherwise agreed in writing by LESSOR and LESSEE, and in such instance, the Lease will expire as of the Expiration Date or at the end of the then current Renewal Term, as applicable Contract Year. The term “Contract Year” under this Lease shall mean any full twelve (12) month period during either the Initial Term or any Renewal Term commencing, for the first such period, on the Lease Commencement Date and, thereafter, on each anniversary of the Lease Commencement Date.

2. **Rent.**

(a) Base Rent. The initial annual base rent for the Leased Premises (“Base Rent”) shall be \$306,000.00 per year, with this amount having been paid by LESSEE at or prior to the Lease Commencement Date with respect to the first Contract Year. The amount of Base Rent shall be fixed for the first three (3) Contract Years, and shall be paid annually in advance on or before each anniversary of the Lease Commencement Date during the first three (3) Contract Years. Thereafter, the Base Rent shall be adjusted and paid as set forth in Section 2(b) below.

(b) CPI Adjustment. Commencing with the fourth (4th) Contract Year and continuing during the remainder of the Initial Term and any applicable Renewal Term, the Base Rent shall be adjusted, effective as of the beginning of each Contract Year (each an “Adjustment Date”), by a percentage equal to the CPI Percentage Increase (as defined below), and shall be paid annually in advance for each such Contract Year within thirty (30) calendar days after each Adjustment Date (in order to permit LESSEE to calculate the CPI Percentage Increase, as set forth below). The term “Consumer Price Index” shall mean the unadjusted Consumer Price Index for All Urban Consumers (CPI-U), All Items, U.S. City Average 1982-84=100, calculated and published by the United States Department of Labor, Bureau of Labor Statistics. In the event the Consumer Price Index is discontinued, the parties shall accept comparable statistics on the purchasing power of the consumer dollar as published at the time of said discontinuation by a responsible periodical of recognized authority to be chosen by the parties. The term “CPI Percentage Increase” shall mean, with respect to any Contract Year for which a CPI Percentage Increase is being calculated, the percentage increase calculated by subtracting the average Consumer Price Index for the last month prior to the preceding Contract Year, from the average Consumer Price Index for the last month prior to the Contract Year for which a CPI Percentage Increase is being calculated, and dividing the positive difference, if any, by the average Consumer Price Index for the last month prior to the preceding Contract Year, and multiplying this quotient (rounded to the nearest ten thousandth) by 100. For illustrative purposes only, if the average Consumer Price Index for the last month prior to the Contract Year for which a CPI Percentage Increase is being calculated was 200.0, and the average Consumer Price Index for the last month prior to the preceding Contract Year was 175.0, then the CPI Percentage Increase would be 14.29% (i.e., $200.0 - 175.0 = 25.0 / 175.0 = 0.1429 \times 100 = 14.29\%$). No adjustment to Base Rent shall reduce the amount of Base Rent to an amount that is less than the Base Rent, as adjusted, due for the preceding Contract Year. The CPI Percentage Increase for any Contract Year shall be calculated by LESSEE, and LESSEE shall deliver written notice describing such calculation in reasonable detail (“CPI Notice”), together with adjusted annual Base Rent for such Contract Year, no later than thirty (30) calendar days after the commencement of the applicable Contract Year. If LESSOR disagrees with LESSEE’s calculation of the CPI Percentage Increase, then

LESSOR shall deliver to LESSEE written notice, describing the basis for such disagreement in reasonable detail ("CPI Disagreement Notice"), not later than thirty (30) calendar after delivery of the CPI Notice. If LESSOR fails to deliver a CPI Disagreement Notice within thirty (30) calendar after delivery of any CPI Notice, then LESSOR shall be conclusively deemed to have agreed with the calculation of the CPI Percentage Increase set forth in such CPI Notice. In the event of delivery of a CPI Disagreement Notice, upon resolution and agreement between the parties, the parties shall make an adjustment to the Base Rent previously paid with respect to such Contract Year.

(c) Additional Rent. LESSEE will pay the LESSOR, in addition to the Base Rent, as adjusted above, additional rent assessed on LNG throughput ("Additional Rent"), which shall be calculated on a per unit basis equal to 18/100th's cent (or \$0.0018) per dekatherm (the "Additional Rent Rate") for natural gas either (i) delivered from LESSEE's LNG regasification terminal into one or more natural gas pipelines ("Delivered Gas") or (ii) loaded from LESSEE's LNG liquefaction terminal into an LNG transport vessel for export (other than for temporary storage purposes or for purposes of providing vessel gasification and cool-down services) ("Delivered LNG"). In no instance will such Additional Rent be less than \$372,600.00 ("Minimum Additional Rent") (e.g.: Minimum Annual Rent on 567,000 dekatherms/day x \$0.0018 per dekatherm times 365 days = \$372,600.00) per Contract Year, regardless of actual throughput volume, but prorated for partial Contract Years. Payment of Additional Rent shall commence upon the earlier of the "Commercial Operations Date" of the Facilities as determined by Federal Energy Regulatory Commission ("FERC"), or December 1, 2017, and shall be paid by LESSEE to LESSOR each Contract Year in twelve equal monthly payments. Beginning on the fourth (4th) anniversary of the Lease Commencement Date, the Minimum Additional Rent will be increased each Contract Year on the anniversary of the Lease Commencement Date by a percentage equal to the CPI Percentage Increase as described in Section 2(b) above; provided, however, that no adjustment to Minimum Additional Rent shall reduce the amount of Minimum Additional Rent to an amount that is less than the Minimum Additional Rent due for the preceding Contract Year, and further provided that in no event shall Minimum Additional Rent exceed \$572,600. The Additional Rent Rate as of the Lease Commencement Date is \$0.0018. Any Additional Rent due over the Minimum Annual Rent will be paid annually, in arrears, based on the actual throughput volumes for the prior Contract Year, within thirty (30) calendar days after the end of such Contract Year. LESSEE acknowledges that vessels calling at the LESSEE's Facilities may also be subject to channel user fees, taxes and/or tariffs should the District impose such fees, taxes or tariffs at a future date in accordance with a general plan authorized by and in accordance with applicable law to be implemented by the District on all commercial vessels subject to the requirement of pilotage. LESSEE, however, shall not be responsible for such fees, taxes or tariffs or for arranging or requiring calling vessel owners or charterers to pay same; the District being solely responsible for dealing directly with such vessel owners and charterers regarding such channel user fees.

(d) Independent Covenants. The obligations to pay Base Rent and Additional Rent are covenants that are independent of all other covenants under this Lease, and no Force Majeure Event (as defined below) will relieve LESSEE of the obligation to pay Base Rent and Additional Rent. Further, the term "Rent" as sometimes used herein shall include Base Rent and Additional Rent.

3. Use of Leased Premises.

(a) Use of Leased Premises by LESSEE. The Leased Premises may be used by LESSEE, its successors and assigns, only for any purpose relating to the loading, unloading, handling, treatment, processing, producing, transporting, distributing, selling, metering and/or storing of (i) natural gas, natural gas liquids, and other natural gas products, derivatives and by-products and (ii) other petroleum and hydrocarbon liquids, gases, products, derivatives and by-products, including, but not limited to, (A) the importation, regasification, production, exportation, liquefaction, refinement, enhancement, other treatment and transportation (including by ship, pipeline, truck or rail) of liquefied natural gas (“LNG”), and LNG by-products and additives and (B) the excavation for, development, construction, installation, use, operation, maintenance, repair, expansion, optimization, alteration and/or removal of any improvements, fixtures, facilities, equipment and/or appurtenances (including natural gas pipelines, natural gas liquids extraction, processing and delivery facilities, acid gas removal units, natural gas liquefaction trains, LNG regasification facilities, and other treatment facilities, cryogenic pipelines, LNG storage tanks, petroleum and other hydrocarbon liquids storage facilities, nitrogen storage and processing facilities, power generation and transmission infrastructure, marine, rail and trucking receipt, delivery and servicing facilities (including jetties, terminals, docks and loading and unloading equipment), and other utilities and facilities (including control rooms, offices, warehouses and yards), in each case, necessary, ancillary or desirable in connection with the performance of the foregoing purposes (“Facilities”). LESSEE shall, at its sole cost and at all times, maintain in reasonably good condition the Facilities. LESSEE may, at its sole cost, excavate, develop, construct, install, use, operate, maintain, repair, expand, modify, alter, demolish, remove and reconstruct the Facilities at any time and from time to time as it deems necessary and appropriate for its purposes. Any improvements demolished and removed by LESSEE pursuant to the preceding sentence shall become the property of LESSEE and LESSEE may retain any amounts received for salvage or otherwise. LESSEE shall at all times comply with all laws, rules and regulations applicable to the Facilities or LESSEE’s activities on the Leased Premises. LESSEE acknowledges and agrees that it will not utilize its dock on the Leased Premises for lay berth or for vessel operations unrelated to the operation, construction, replacement or maintenance of the Facilities or Leased Premises without the consent of the LESSOR, which consent may be conditioned on a mutually satisfactory revenue sharing arrangement.

(b) Waiver of Surface Rights. To the extent LESSOR holds any rights to oil, gas, sulphur, or other minerals (“Minerals”) in the Leased Premises, LESSOR waives any right of LESSOR or its lessees or assignees to use the surface of the Leased Premises to explore for, drill for, access, extract, mine, exploit or otherwise make use of such Minerals, during the term of this Lease, and LESSOR and/or its lessees or assigns shall exercise any rights to such Minerals via directional drilling or other means (“Surface Waiver”). If any third party holds any rights in Minerals, LESSOR shall obtain a Surface Waiver from such third party, for the benefit of LESSEE. Any directional drilling or other subsurface Mineral activities of LESSOR and/or its lessees or assignees or any other party shall take place at a depth of not less than the greater of 2500 feet or such other feet as may be determined or set by the FERC below the surface and shall not adversely affect the lateral or subjacent support of the Facilities or interfere with LESSEE’s operations or rights under this Lease in any way.

(c) Entry of LESSOR. LESSOR may request entry into the Leased Premises during normal business hours by delivery of a written request to LESSEE a reasonable time (but in any event not less than twenty-four (24) hours) prior to the requested entry, and LESSEE shall not unreasonably withhold its approval of such request, provided, however, that any entry into the Leased Premises by LESSOR and/or its employees or agents shall be subject to LESSEE's rules and security procedures and all applicable laws, permits and regulations.

(d) Condition of Leased Premises. LESSEE declares that LESSEE has thoroughly inspected the Leased Premises. LESSEE accepts the property, component parts, improvements and conditions of the Leased Premises in an "as is" and "where is" basis, in their condition as of the Lease Commencement Date, and assumes responsibility therefor to the fullest extent allowed by LSA-R.S. 9:3221. Without prejudice to Section 10, LESSEE expressly waives and releases LESSOR from all warranties pertaining to the condition of the Leased Premises, including, but not limited to, any warranty against visible, hidden, or latent defects, and LESSEE does also waive any right LESSEE may or might have relative thereto (i) to rescind or revoke this Lease on the basis of any such warranty, and (ii) except for any damage to the Leased Premises arising from the gross negligence or willful misconduct of LESSOR or its employees, contractors or agents after the Lease Commencement Date, to have LESSOR repair or replace all or any part of the Leased Premises and any component parts, improvements, equipment, fixtures and any other items that might be relative to the Leased Premises. Except for any damage to the Leased Premises arising from the gross negligence or willful misconduct of LESSOR or its employees, contractors or agents after the Lease Commencement Date, LESSOR shall not be required to make any improvements or repairs of any kind or character to the Leased Premises during the term of this Lease, and LESSEE shall assume all responsibility for improvements and repairs necessary or desirable in connection with LESSEE's use of the Leased Premises.

(e) Labor and Material Liens. LESSEE shall keep the Leased Premises free from liens arising from delinquent invoices for work or services performed on the Leased Premises or materials provided to the Leased Premises at LESSEE's request, provided that LESSEE shall have the right to dispute any such invoice so long as LESSEE posts a bond sufficient to remove or release any labor and material lien which may arise from such disputed invoice.

(f) Utility Charges. LESSOR shall not have any obligation to pay any utility charges made or incurred in connection with LESSEE's use of the Leased Premises, and LESSEE shall be solely responsible therefor.

4. Dredging; Easements; Channel Access.

(a) Dredging of the Slip and Ship Channel. LESSEE shall have the right to remove soil and spoil from, and to add fill to, the Leased Premises and to dredge the slip and dredge and widen the Calcasieu River Ship Channel or the Industrial Canal, and, without further payment to LESSOR, deposit the dredge spoils on areas owned by LESSOR designated as Areas 12A and 12B (as allowed by applicable law), in each case in connection with the excavation for, development, construction, installation, use, operation, maintenance, repair, expansion, optimization, alteration and/or removal of the Facilities, and for the purpose of constructing, creating, expanding, operating and maintaining a ship berthing and turning basin, provided, however, that LESSEE shall, at its own expense, obtain any required permits and/or approvals

from the United States Army Corps of Engineers, (the “Corps”) and/or any other governmental agencies, and LESSEE shall comply with such permits and approvals.

(b) *Easements.* To the extent required land or property interests are currently owned by the LESSOR, LESSOR will grant any reasonable required easements or rights of way that are necessary or useful in constructing, maintaining or operating the Facilities to the extent that such easements or rights of way do not unreasonably interfere with the use or future development of the land or property rights by LESSOR.

(c) *Channel Access and Usage.* LESSEE and the District agree and acknowledge that nothing in this Lease is intended to, or shall be construed as, granting vessels calling at LESSEE’s Facilities any greater or lesser priority with regard to channel access and usage than existing users of the channel, and vessels calling at LESSEE’s Facilities are subject to the same vessel traffic controls and management as the District may, in compliance with applicable laws, impose on other vessels using the Calcasieu River Ship Channel.

5. FERC Application; Wetland Mitigation.

(a) *FERC Application.* The District shall reasonably cooperate with LESSEE, at no cost to the District, with respect to any application or other submission by LESSEE to the FERC, Department of Energy or other governmental or regulatory agencies related to the proposed Facilities or LESSEE’s other permitted uses of the Leased Premises, including any expansion of such Facilities, and the District shall not oppose any such application or other such submission

(b) *Wetlands Mitigation.* LESSOR has provided LESSEE with that certain letter dated January 25, 1994 from the Corps, attached hereto as Exhibit B, stating that the Corps has determined that the Leased Premises are not subject to wetland mitigation or regulation. However, should such determination be found not to be valid and enforceable, the LESSOR will use its best efforts to assist LESSEE to minimize any required wetland permitting, regulation or mitigation, and reasonably cooperate to make other lands or property interests owned by the LESSOR available to LESSEE for the purpose of effecting any such required wetlands permitting.

6. Additional Charges Legally Assessable by the District. LESSEE hereby acknowledges that the Base Rent and the Additional Rent constitute all charges applicable for the use, enjoyment and operation of the Leased Premises, but are not intended to include, and will not include, reduce or abate, any charges legally assessable by the District against vessels calling at LESSEE’s Facilities or using any other facilities or waterways or otherwise subject to the District’s jurisdiction to assess fees and such fees and charges will be separately assessed, charged and paid by the vessel’s owners or charterers in accordance with the District’s assessments of same, all in accordance with applicable laws and regulations. Nothing in this Lease is intended to relieve obligations of LESSEE to pay taxes or tariffs legally assessable by the District that LESSEE is obligated to pay the District under applicable laws, provided that all such fees and charges are assessed and applied uniformly and apply to the use of the District’s waterways (and not land).

7. **Permits.** LESSOR authorizes LESSEE to secure, at the cost of LESSEE, any permits or authorizations required by any state, local, or federal agency, or other governing or regulating authority, for LESSEE's Facilities or operations, and LESSOR shall cooperate, as landowner, in securing any such permits or authorizations. LESSEE shall assume full responsibility for any obligations and liabilities imposed in securing such permits, contained in such permits, or imposed by law with respect to such permits, and shall hold LESSOR harmless from any liability, penalties, damages, expenses, and judgments, and shall defend any actions arising from the securing or issuance of such permits or the applications therefor; provided, however, that any such liability, penalties, damages, expenses or judgments arising solely as a result of the negligence or willful misconduct of the District shall be excluded from this indemnity.

8. **Ownership of Facilities; Surrender at End of Lease; Liability.** All Facilities constructed or placed upon, in, under, over, or through the Leased Premises by LESSEE, shall remain the property of LESSEE and may be removed by LESSEE at any time during the Initial Term or any Renewal Term, subject and subordinate to Section 17 and the rights of any Leasehold Lender under any Leasehold Mortgage. Subject and subordinate to Section 17 and the rights of any Leasehold Lender under any Leasehold Mortgage, upon the expiration or termination of this Lease, LESSOR may elect, in its sole discretion, by delivery to LESSEE of written notice thereof (a "Surrender Election Notice"), to require LESSEE to either surrender possession of the Facilities that are permanently attached to the ground upon the Leased Premises (collectively, "Permanent Facilities"), at no cost to LESSOR, in which case such Permanent Facilities shall be surrendered to LESSOR in their "as-is, where-is" condition, with all defects) or remove the Permanent Facilities (provided, however, that in no event shall LESSEE be required to remove any docks, berths, wharves, electrical interconnection infrastructure, roadways, rail lines, underground pipelines, fill materials, foundations, or other underground Facilities, all of which may be abandoned in place in accordance with applicable laws). With respect to any scheduled expiration of this Lease, LESSOR shall deliver the Surrender Election Notice to LESSEE not less than twenty-four (24) months prior to scheduled expiration of the Initial Term or Renewal Term, as applicable. With respect to any earlier termination of this Lease, LESSOR shall deliver the Surrender Election Notice to LESSEE as soon as reasonably practicable, but not more than ten (10) calendar days after the effective date of such termination (the "Early Termination Date"). If LESSOR elects to require removal of the Permanent Improvements, then LESSEE shall have an additional period of up to twenty-four (24) months after the scheduled expiration of this Lease or the Early Termination Date, as applicable (the "Removal Period"), to complete such removal in accordance with this paragraph, in which case the terms and conditions of this Lease shall continue to apply during such Removal Period, except that LESSEE shall not be obligated to pay Base Rent or Additional Rent during the Removal Period and LESSEE may not use the Leased Premises for any purpose other than removal of the Permanent Improvements. LESSEE shall continue to have the right to use Henry Pugh Boulevard for ingress, egress and access to, from and between the Leased Premises and Big Lake Road during the Removal Period. With respect to Facilities that are not Permanent Facilities, LESSEE shall remove such Facilities not later than one hundred eighty (180) calendar days after the scheduled expiration of this Lease or the Early Termination Date, as applicable. Subject and subordinate to Section 17 and the rights of any Leasehold Lender under any Leasehold Mortgage, any Facilities that are not removed by the time fixed for such removal in this paragraph shall be irrevocably deemed to be abandoned by LESSEE, and LESSOR may

elect, in its sole discretion, to remove such Facilities from the Leased Premises at LESSEE's sole cost (less any salvage value received by LESSOR) and may dispose of such Facilities without notice or liability to LESSEE, provided, however, that title to any such Facilities that LESSOR does not remove from the Leased Premises shall automatically pass to LESSOR. In no event shall LESSEE be required to restore the Leased Premises to their condition prior to construction of the Facilities or to restore any alterations of the Leased Premises, and LESSEE shall surrender the Leased Premises upon the expiration or earlier termination of this Lease (as the same may be extended by the Removal Period) in their "as-is, where-is" condition, with all defects (provided, however, that in no event LESSEE shall be excused from any default of LESSEE's obligations under this Lease). If the LESSEE holds over after the expiration or termination of this Lease, with or without the consent of the LESSOR, such tenancy shall be from month-to-month only. Such month-to-month tenancy, whether with or without the LESSOR's consent, shall be subject to every other term, covenant, and agreement contained herein, and shall not constitute a renewal or extension of the term of this Lease. LESSOR shall not be responsible for any loss or damage occurring to any Facilities owned, leased, or operated by the LESSEE, its agents, or employees, prior to or subsequent to the termination of this Lease, other than, to the extent required by law, for such loss or damage occurring as a result of the negligent conduct or the willful misconduct or gross negligence of the LESSOR, its officers, representatives, agents, contractors or employees or the LESSOR's misrepresentations or its breach of or default under this Lease.

9. Casualty; Condemnation.

(a) *Casualty.* This Lease shall not terminate or be cancelled at any time upon the damage or destruction by fire or other casualty of all, substantially all, or any part of the Leased Premises or the LESSEE's Facilities. LESSEE shall have full use of and the right to apply its insurance proceeds available for rebuilding and restoration of LESSEE's Facilities.

(b) *Condemnation or Expropriation.* If the whole of the Leased Premises shall be taken under power of eminent domain or expropriation by any public or private authority, then this Lease and the applicable term hereof shall cease and terminate as of the date of such taking. If only a portion of the Leased Premises shall be taken, and such partial taking shall result in the inability of LESSEE to operate its Facilities, or have a material adverse effect upon LESSEE's operation of its Facilities, on the remainder of the Leased Premises, then LESSEE may, at its election, terminate this Lease by giving LESSOR notice of the exercise of LESSEE's election within one hundred twenty (120) calendar days after LESSEE shall receive notice of such taking. In the event of termination under this Section 9(b), and any unearned Base Rent, Additional Rent or other charges, if any, paid in advance, shall be refunded to LESSEE, and this Lease shall cease and terminate as of the date of such taking, subject, however, to the right of LESSEE, at its election, (i) to continue to occupy the Leased Premises, subject to the terms and provisions of this Lease, for all or such part, as LESSEE may determine, of the period between the date of such taking and the date when possession of the Leased Premises shall be taken by the public authority; and (ii) to keep this Lease in full force and effect so as to obtain the highest possible award from the condemning authority, if termination of this Lease would reduce any award for a taking, as set forth herein below in this Section 9(b). In the event of a taking of a portion of the Leased Premises and this Lease is not terminated, then Base Rent shall be reduced pro rata based upon the portion of the Leased Premises taken. The parties reserve any rights each may have under applicable law to seek from the expropriating authority an award for a taking of their

respective interests in, under and to the Leased Premises and this Lease. All compensation awarded for any taking of the Leased Premises shall belong to the party to whom such award was made. If only one award is made as to the Leased Premises, such award shall be allocated between LESSOR and LESSEE in accordance with their respective interests. Notwithstanding the foregoing, any award attributable or applicable to any improvements on the Leased Premises shall belong to LESSEE. LESSOR agrees that, to the extent permitted by law, LESSOR waives and forebears the use of any of its power of expropriation that would impair LESSEE's interest in, under and to this Lease or the performance of this Lease.

10. **Warranty of Title.** This Lease is made without warranty of title or possession either expressed or implied, except as expressly set forth in this Lease. This Lease, as it applies to the Leased Premises, is subject to all matters of record in the Official Records as of the Lease Commencement Date with respect to the Leased Premises. LESSOR covenants and warrants that LESSOR is the sole owner of the Leased Premises (subject to matters of record in the Official Records), and LESSEE shall peacefully hold and enjoy all of the rights granted by this Lease for the entire term (including any Renewal Terms) without hindrance or interruption by LESSOR or any person lawfully or equitably claiming by, through or under or superior to LESSOR, subject to the terms and conditions of this Lease; and as long as LESSEE is not in material default of the terms and conditions of this Lease beyond applicable notice and cure periods.

11. **Taxes.**

(a) Taxes on Facilities. LESSEE agrees to pay any and all taxes assessed against LESSEE's Facilities, or assessed against the Leased Premises as a result of Facilities placed on the Leased Premises by LESSEE. LESSEE shall pay all taxes and license fees required for operations LESSEE conducts on the Leased Premises. LESSEE shall have the right to seek abatement of taxes for any portion of the term of this Lease, through one or more programs available in the State of Louisiana with respect to taxes assessed against LESSEE's Facilities and the equipment, trade fixtures and other tangible personal property proposed to be used by Tenant in connection with its use and occupancy of the Facilities. The District agrees to reasonably cooperate with LESSEE in seeking such abatement of taxes, at no cost or expense to the District.

(b) Taxes on Real Property. The District is exempt from the payment of ad valorem property taxes. The District will use its reasonable best efforts to maintain current law that the District is not required to pay taxes. However, if the law providing for such exemption of the District from taxes changes or otherwise taxes are owed by the District, then LESSEE shall pay all taxes assessed with respect to the ownership by the District of the Leased Premises during the term of this Lease so long as the District delivers to LESSEE a copy of the tax assessor's invoice for such taxes not less than thirty (30) calendar days prior to the due date shown in such invoice, in which case LESSEE shall pay the amount due no later than the due date shown in such invoice. The District shall pay (and LESSEE shall not be responsible or liable for) any fines or penalties assessed for non-payment or late payment of such taxes if the District does not deliver the tax assessor's invoice to LESSEE not less than thirty (30) calendar days prior to the due date shown in such invoice. Notwithstanding the foregoing, "taxes," as used herein, shall not include, and LESSEE shall not be required to pay, any franchise, transfer, income, capital gains or similar tax

of or on LESSOR unless such tax is imposed, levied or assessed in substitution for ad valorem property tax.

12. **Default by LESSEE or by LESSOR.**

(a) If LESSEE is in default under this Lease, or has failed to comply with any of its obligations hereunder within the time periods set forth herein, LESSOR shall give LESSEE specific written notice of the alleged breach in which event (i) LESSEE shall have ten (10) calendar days from said notice within which to cure any monetary default, and (ii) LESSEE shall have forty-five (45) calendar days from said notice within which to cure any other default, provided, however, after such notice, if LESSEE has commenced in good faith to cure such non-monetary default within said forty-five (45) calendar day period but cannot reasonably cure such non-monetary default without more time, then LESSEE shall have such additional time required to cure such default so long as LESSEE is diligently prosecuting such cure to completion.

(b) If LESSEE fails to cure any default within the time periods set forth in Section 12(a) above, then subject to Section 17 below, LESSOR shall have the right at LESSOR's option to do any one or more of the following: (i) terminate this Lease effective immediately or as of any date which LESSOR may select, or (ii) proceed one or more times for past due installments of Rent without prejudicing LESSOR's rights to proceed later for remaining installments or to exercise any other remedy, or (iii) require specific performance of LESSEE, or (iv) seek and recover damages from LESSEE, or (v) have recourse to any other remedy to which LESSOR may be entitled to by law. Notwithstanding Section 17 below, LESSOR shall also have the right to draw on any Letter of Credit provided by LESSEE in accordance with Section 18 below.

(c) If LESSOR is in default under this Lease, or has failed to comply with any of its obligations hereunder within the time periods set forth herein, LESSEE shall give LESSOR specific written notice of the alleged breach in which event (i) LESSOR shall have ten (10) calendar days from said notice within which to cure any monetary default, and (ii) LESSOR shall have forty-five (45) calendar days from said notice within which to cure any other default, provided, however, after such notice, if LESSOR has commenced in good faith to cure such non-monetary default within said forty-five (45) calendar day period but cannot reasonably cure such non-monetary default without more time, then LESSOR shall have such additional time required to cure such default so long as LESSOR is diligently prosecuting such cure to completion.

(d) If LESSOR fails to cure any default within the time periods set forth in Section 12(c) above, then LESSEE shall have the right to invoke any remedy allowed by law.

(e) Should it become necessary for LESSOR, because of breach of LESSEE, to place the enforcement of this Lease or any part hereof, or the collection of any Rent due or to become due hereunder, or recovery of the possession of the Leased Premises, in the hands of an attorney, or file suit upon the same, LESSEE also agrees to pay LESSOR's costs and charges pertaining thereto, including reasonable attorney's fees. Should it become necessary for LESSEE, because of breach of LESSOR, to place the enforcement of this Lease or any part hereof, in the hands of an attorney, or file suit upon the same, LESSOR also agrees to pay LESSEE's costs and charges pertaining thereto, including reasonable attorney's fees.

(f) In regard to any claim by LESSOR or LESSEE against the other, LESSOR and LESSEE agree to, reasonably and in good faith, take all available and appropriate steps to mitigate, to the maximum extent reasonable under the circumstances, any loss, damage or claim made by LESSOR or LESSEE against the other.

13. **Assignment.** This Lease and the rights granted hereby may only be assigned by LESSEE, its successors and assigns, in whole or in part, with the written consent of LESSOR, which consent shall not be unreasonably withheld, conditioned or delayed by LESSOR provided that LESSEE is not in default beyond applicable notice and cure periods under this Lease. LESSEE shall give LESSOR written notice of any proposed assignment hereof no less than thirty (30) calendar days prior to the proposed effective date of such assignment. Subject to Section 17, any assignee shall assume LESSEE's obligations and liabilities hereunder, including, but not limited to, the obligation to provide replacement credit support in accordance with Section 18. Notwithstanding the foregoing, LESSEE shall have the right, after thirty (30) calendar days prior written notice thereof to LESSOR but without the requirement of consent by LESSOR, to assign LESSEE's rights, title and interest in, to and under this Lease to (a) any Affiliate (as defined below) of LESSEE, (b) any transferee or grantee of all or substantially all of the assets of LESSEE or ownership interests (whether stock, shares or membership interests) in LESSEE, (c) any entity resulting from a merger, non-bankruptcy reorganization or consolidation with LESSEE, (d) to any entity owned by an Affiliate or Affiliates of one or more of the ultimate parent entities that own direct or indirect interests in LESSEE or (e) a Leasehold Mortgagee or any purchaser upon a foreclosure of a Leasehold Mortgage or transferee upon a transfer in lieu of foreclosure (*dation en paiement*) pursuant to a Leasehold Mortgage; provided, in each case, that such assignment shall not be a subterfuge by LESSEE to avoid its obligations under this Lease, and upon such assignment, LESSEE shall not be released from liability under this Lease without LESSOR's written consent. The term "Affiliate" shall mean (i) LESSEE's parent company or any wholly owned subsidiary of LESSEE's parent company, or (ii) any entity Controlling, under common Control or Controlled by LESSEE or LESSEE's parent company. The term "Control" shall mean (A) with respect to a corporation, the right to exercise, directly or indirectly, more than fifty percent (50%) of the voting rights attributable to the stock or shares of the controlled corporation, and (B) with respect to an individual or entity that is not a corporation, the possession, directly or indirectly, of the power to direct or cause the direction of the management or policies of the controlled individual or entity.

14. **Indemnification and Insurance.**

(a) LESSEE's General Agreement to Indemnify. The LESSEE releases the District, its officers, representatives, employees, agents, successors and assigns, (individually and collectively, "District Indemnatee") from, assumes any and all liability for, and agrees to indemnify the District Indemnatee against all claims, liabilities, obligations, damages, penalties, litigation, costs, charges, and expenses (including, without limitation, reasonable attorney's fees, engineers' fees, architects' fees, and the costs and expenses of appellate action, if any), imposed on, incurred by or asserted against the District Indemnatee or its interest in real property in the Leased Premises arising out of (i) the use or occupancy of the Leased Premises by the LESSEE, its officers, representatives, agents, and employees, (ii) the construction or operation of the Facilities by the LESSEE, its officers, representatives, agents, and employees, (iii) any claim arising out of the use, occupancy, operation, or construction of the Leased Premises by the LESSEE, its officers, representatives, agents, and

employees, and (iv) activities on or about the Leased Premises by the LESSEE, its officers, representatives, agents, and employees, of any nature, whether foreseen or unforeseen, ordinary, or extraordinary, in connection with the construction use, occupancy, operation, maintenance, or repair of the Facilities, or the Leased Premises by the LESSEE, its officers, representatives, agents, and employees, except to the extent any such claim, liability, obligation, damage or penalty is attributable to the negligence or willful misconduct of the District Indemnitee. The indemnity provided in this Section shall be to the fullest extent permitted by law, including, but not limited to, La. R. S. 9:322, and shall include within its scope any liability imposed by law on the District on a strict liability theory as landowner for physical defects in the Leased Premises (except for environmental contamination); it being the intention of the parties for LESSEE to assume liability for such defects in the Leased Premises during the term of this Lease. This Section shall include within its scope but not be limited to any and all claims or actions for wrongful death, but any and all claims brought under the authority of or with respect to any local, state, or federal environmental statute or regulation shall be covered by Section 14(b) and not this Section 14(a).

(b) *LESSEE's Environmental Indemnification.* The LESSEE agrees that it will comply with all environmental laws and regulations applicable to the LESSEE, including without limitation, those applicable to the use, storage, and handling of hazardous substances in, on, or about the Leased Premises. The LESSEE agrees to indemnify and hold harmless each District Indemnitee against and in respect of, any and all damages, claims, losses, liabilities, and expenses (including, without limitation, reasonable attorneys, accounting, consulting, engineering, and other fees and expenses), which may be imposed upon, incurred by, or assessed against any District Indemnitee by any other party or parties (including, without limitation, a governmental entity), arising out of, in connection with, or relating to the subject matter of: (a) the LESSEE's breach of the covenant set forth above in this Section 14(b), or (b) any environmental condition of contamination on the Leased Premises or any violation of any federal, state, or local environmental law with respect to the Leased Premises first occurring after the Lease Commencement Date and caused by the LESSEE's operations or facilities. For the avoidance of doubt, and notwithstanding anything to the contrary contained in this Lease, LESSEE shall not be responsible for any environmental contamination on the Leased Premises existing prior to the Lease Commencement Date, or liable for any damage or claims attributable to any such pre-existing contamination or with respect to the prior or future actions or activities of the LESSOR or any third party.

(c) *Burden of Proof.* The LESSEE, at its own cost, shall cause to be conducted a Phase I environmental assessment and, if indicated by such Phase I, a Phase II environmental assessment of the Leased Premises prior to the commencement of construction of the Facilities and a copy of all written reports issued in connection with such assessments shall be given to the District within ten (10) calendar days of completion. If, as a result of such assessments, environmental contamination of the Leased Premises is discovered, such contamination shall be deemed to have existed prior to the Lease Commencement Date. Any condition of environmental contamination discovered on the Leased Premises after the completion of the environmental assessments (Phase I and Phase II) which is not disclosed in the Phase I or Phase II environmental assessments shall be presumed, for purposes of the LESSEE's agreement to indemnify the District Indemnitee in Section 14(b), to have been caused by the LESSEE's operations or facilities, unless the LESSEE can demonstrate, by a preponderance of the evidence, that (i) such condition originated off the Leased Premises, or (ii) such condition was not caused by the LESSEE's operations or facilities. The provisions of this Section 14(c) are intended only to allocate the burden of establishing causation between the

LESSEE and the District with respect to environmental contamination discovered before and after the Lease Commencement Date. In no event shall any third party other than the District Indemnitee be entitled to any benefit, reliance, or presumption based on the provisions of causation or liability of either party with respect to any environmental contamination of the Leased Premises.

(d) *Defense & Settlement.* The indemnity obligations of LESSEE under Section 14(a) and Section 14(b) above shall be subject to the applicable District Indemnitee giving LESSEE prompt notice when any District Indemnitee becomes aware of any actual or threatened claim, action or administrative enforcement action which might give rise to a claim for indemnification under these provisions, including a description of the relevant facts and circumstances regarding any such actual or threatened claims or actions. Notice shall be prompt enough to allow LESSEE to respond to same in a timely fashion such that all material defenses, legal or factual, are preserved. LESSEE shall thereafter have sole responsibility and control over the defense and costs of defense, and any settlement, of any such claims or actions and any liability which arises as a result of any interference with LESSEE's right to control such defense, or any failure to cede same, shall not be within the scope of LESSEE's indemnity obligations hereunder; provided, however, to the extent (i) any District Indemnitees are dissatisfied with LESSEE's conduct of the defense any such claims or actions, (ii) LESSEE breaches its obligation to defend, or (iii) any District Indemnitees reasonably determine that the interests of LESSEE and the District Indemnitees are not materially aligned, such District Indemnitees may retain their own separate counsel, at their sole cost and expense (unless LESSEE is shown to be in breach of its obligations hereunder with regard to such claim or action) to protect the respective interests of the District Indemnitees. Similarly, LESSEE shall give LESSOR prompt notice when it becomes aware of any or actual or threatened claim, action or administrative enforcement action which might give rise to a claim for indemnification under these provisions.

(e) *Survival of Indemnities.* The foregoing indemnities shall survive the expiration or other termination of this Lease and shall be the sole and exclusive remedy of District and the District Indemnitees with regard to any and all damages, claims, losses, liabilities, and expenses (including, without limitation, reasonable attorneys, accounting, consulting, engineering, and other fees and expenses) ("Claims"), which are within the scope of the above stated indemnities.

(f) *Insurance.*

(i) At all times during the term of this Lease, at its sole expense, LESSEE shall maintain or cause to be maintained for the protection of LESSEE and LESSOR, commercial general liability insurance applying to the use and occupancy of the Leased Premises and the business operated by LESSEE on the Leased Premises, which shall be written to apply to bodily injury (including death), property damage and personal injury losses, and shall be endorsed to include LESSOR as an additional insured. Such insurance shall have a minimum combined single limit of liability of at least \$10,000,000.00 per occurrence and a general aggregate limit of at least \$20,000,000.00, and LESSEE shall provide, in addition, excess liability insurance on a following form basis, with overall limits of at least \$10,000,000.00.

(ii) At all times during the term of this Lease, LESSEE shall maintain in effect policies of insurance covering the Facilities during the term of this Lease in an amount

reasonably determined by LESSEE, providing protection against any peril included within the classification “all risk coverage” or “causes of loss special form” (as such terms are used in the State of Louisiana), including vandalism and malicious mischief. LESSEE shall be entitled to all proceeds of such insurance, and the value of the Facilities shall be determined by LESSEE.

(iii) All insurance required to be carried under this Lease shall be issued by responsible insurance companies. Insurance companies rated A-VII or better by Best’s Insurance Reports shall be deemed acceptable. Each insurance policy carried by LESSEE in accordance with this Lease shall include a waiver of the insurer’s rights of subrogation to the extent necessary to give effect to the release and shall name the District as an additional named insured. The foregoing waiver shall be effective whether or not a waiving party shall obtain and maintain the insurance which such waiving party is required to obtain and maintain pursuant to this Lease.

15. **Severability.** If any provision of this Lease or the application thereof to any person, place or circumstance shall be held by a court of competent jurisdiction, in a final and unappealable decision, to be invalid, unenforceable or void, then the remainder of the Lease and such provisions as applied to other persons, places, and circumstances shall remain in full force and effect, unimpaired by the holding, it being the intent of the parties that each and every provision of this Lease shall be enforceable to the fullest extent permitted by law.

16. **Notices.** All notices and correspondence between the parties shall be made or given in writing and shall be personally delivered, or delivered by facsimile or e-mail (provided, however, if any delivery is made by facsimile or e-mail, such delivery shall be deemed delivered only if the party giving such notice obtains a confirmation of receipt and also delivers such notice by means of another permitted method hereunder), or sent by registered or certified United States mail, postage prepaid, return receipt requested, or expedited prepaid delivery service, either commercial (such as UPS or FedEx) or United States Postal Service, to the applicable party or at the addresses set forth below, or such other address as may be furnished by notice in accordance with this Section 16:

If to LESSOR:

Lake Charles Harbor and Terminal District
Executive Director
751 Bayou Pines East, Suite P
Lake Charles, LA 70601
Email:
Fax:

with a copy to:

Lake Charles Harbor and Terminal District
General Counsel
751 Bayou Pines East, Suite P
Lake Charles, LA 70601

Email:
Fax:

If to LESSEE:

Magnolia LNG, LLC

Email:
Fax:

with a copy to:

Chad Mills
Sutherland, Asbill & Brennan, LLP
1001 Fannin Street, Suite 3700
Houston, TX 77002-6760
Email: chad.mills@sutherland.com
Fax: (713) 654-1301

Winfield E. Little, Jr.
616 Broad Street
P.O. Box 3759 (70602)
Lake Charles, LA 70601
Email: wlittle@littlelawfirm.com
Fax: (337) 430-0120

A notice shall be deemed to have been given: in the case of hand delivery, at the time of delivery; in the case of facsimile or e-mail, the time of confirmation of receipt; in the case of registered or certified mail, when delivered (as evidenced by the receipt) or the first attempted delivery on a business day; or in the case of expedited prepaid delivery, upon the first attempted delivery on a business day.

17. **Leasehold Mortgagee Provisions.** The provisions of this Section 17 shall supersede any contrary or inconsistent provisions in this Lease and in the event of any inconsistency or conflict between the provisions of this Section and any other provision of this Lease, the provisions of this Section shall govern and control.

(a) LESSEE's Right to Mortgage Leasehold Interest; Recognition of Leasehold Lender as Leasehold Mortgagee. LESSEE shall have the absolute right (but not the obligation), without seeking the consent or approval of LESSOR, to grant one or more leasehold mortgages encumbering LESSEE's interest in the Leased Premises and in this Lease. The term "Leasehold Lender" shall mean, at any point in time, the holder of a Leasehold Mortgage that provides written notice to LESSOR of its status as such. The term "Leasehold Mortgage" shall mean, at any point in time, a leasehold mortgage to secure debt or other equivalent instruments, as the case may be (as the same may be amended from time to time), encumbering LESSEE's interest

in the Leased Premises and this Lease. It is acknowledged and agreed that, during the term of this Lease, there may be multiple Leasehold Mortgages and multiple Leasehold Lenders and that each Leasehold Lender may, from time to time, assign its right, title and interest in and to the Leasehold Mortgage and this Lease.

(b) Right to Perform for LESSEE; Right to Cure.

(i) In addition to the rights provided in Section 17(a), LESSOR acknowledges and agrees that Leasehold Lender shall have the right to perform any term, covenant, condition or agreement to be performed by LESSEE under this Lease, and LESSOR shall accept such performance by Leasehold Lender with the same force and effect as if furnished by LESSEE. In the event of a default by LESSEE under this Lease and prior to any termination of this Lease by LESSOR, LESSOR acknowledges and agrees that LESSOR shall provide Leasehold Lender with notice of the same and Leasehold Lender shall have the right (but not the obligation) to commence to cure such default within the same period of time as LESSEE has under this Lease, plus an additional sixty (60) calendar days. LESSOR agrees that LESSOR shall not terminate this Lease in connection with any such default so long as Leasehold Lender has cured or commenced to cure and continues diligently to cure in accordance with the foregoing (A) any such non-payment default and (B) any such default in the payment of any portion of Base Rent or Additional Rent.

(ii) If any default in the performance of an obligation of LESSEE under this Lease is not susceptible to being cured by Leasehold Lender, LESSOR shall have no right to terminate this Lease with respect to such default and such default shall be deemed waived for the benefit of Leasehold Lender only, provided that:

(1) Leasehold Lender shall have commenced to cure (i) any other non-payment default of LESSEE that is susceptible to being cured by Leasehold Lender and (ii) any default in the payment of any portion of Base Rent or Additional Rent, in each case, within the time periods prescribed under Section 17(b)(i), above;

(2) Leasehold Lender (or its designee) shall have commenced to acquire LESSEE's interest in this Lease and the Leased Premises or to commence foreclosure or other appropriate proceedings under the Leasehold Mortgage within the time periods prescribed under Section 17(b)(i);

(3) if Leasehold Lender (or its designee) shall acquire LESSEE's interest in this Lease and/or the Leased Premises, Leasehold Lender (or its designee) shall, without prejudice to Section 17(e), (A) commence to cure and continue diligently to cure all non-payment defaults that are susceptible to being cured by Leasehold Lender with commercially reasonable diligence, (B) cure any payment default in respect of any portion of Base Rent or Additional Rent and (C) perform and observe all other agreements, covenants and conditions which are to be performed or observed by LESSEE under this Lease after the date of such acquisition; and

(4) if any third party shall, by foreclosure or *dation en paiement* under the Leasehold Mortgage or by assignment or other transfer from Leasehold Lender, acquire LESSEE's interest in and to the Leased Premises under this Lease, such third party shall, without prejudice to Section 17(e), (A) commence to cure and continue diligently to cure all non-payment defaults that are susceptible to being cured by a third party with commercially reasonable diligence, (B) cure any payment default in respect of any portion of Base Rent or Additional Rent and (C) perform and observe all other agreements, covenants and conditions which are to be performed or observed by LESSEE under this Lease after the date of such acquisition.

However, if LESSEE is in default beyond applicable notice and cure periods under this Lease and Leasehold Lender fails to act under Section 17(b) above within the applicable time periods set forth in Section 17(b)(i), then notwithstanding any provision in this Section 17 to the contrary, LESSOR may exercise any right to terminate this Lease that LESSOR may have under Section 12 above.

(c) *No Modification Without Leasehold Lender's Consent.* Neither LESSOR nor LESSEE will amend, modify, cancel or surrender this Lease without Leasehold Lender's prior written consent, and any such action taken without Leasehold Lender's consent shall not be binding on LESSEE or Leasehold Lender or their respective successors and assigns (and this Lease shall be interpreted as if such action was not taken), provided, however, that if LESSEE is in default beyond applicable notice and cure periods under this Lease and Leasehold Lender fails to act under Section 17(b) above within the applicable time periods set forth in Section 17(b), then Leasehold Lender's prior written consent shall not be required for LESSOR to exercise any right to terminate this Lease that LESSOR may have under Section 12 above.

(d) *Delivery of Notices.* LESSOR shall simultaneously deliver to Leasehold Lender copies of all notices, statements, information and communications delivered or required to be delivered to LESSEE pursuant to this Lease, including, without limitation, any notice of any default by LESSEE. In addition, LESSOR shall promptly notify Leasehold Lender in writing of any failure by LESSEE to perform any of LESSEE's obligations under this Lease. No notice, statement, information or communication given by LESSOR to LESSEE shall be binding or affect LESSEE or Leasehold Lender or their respective successors and assigns unless a copy of the same shall have simultaneously been delivered to Leasehold Lender in accordance with this Section 17(d). All notices to Leasehold Lender shall be addressed to any Leasehold Lender at any address that such Leasehold Lender shall provide in writing to LESSOR and LESSEE, and shall be delivered in a manner permitted under (and shall be deemed delivered in accordance with) Section 16. Notwithstanding anything to the contrary in this Lease, LESSOR shall not exercise any remedies related to LESSEE's default hereunder until (x) LESSOR has delivered notice of such default to Leasehold Lender pursuant to this Section 17(d) and (y) all applicable cure commencement periods following the delivery of such notice have expired.

(e) *Leasehold Lender Not Obligated Under Lease; Permitted Transfers.* The granting of the Leasehold Mortgage shall not be deemed to constitute an assignment or transfer of this Lease or the Leased Premises to Leasehold Lender, nor shall Leasehold Lender, in its capacity as the holder of the Leasehold Mortgage, be deemed to be an assignee or transferee of

this Lease or of LESSEE's interests in the Leased Premises thereby created so as to require Leasehold Lender, as such, to assume the performance of any of the terms, covenants or conditions on the part of LESSEE to be performed thereunder. In no event shall any act or omission of Leasehold Lender (including, without limitation, the acquisition of LESSEE's interest in this Lease and the Leased Premises created thereby in a transaction described in this Section 17 or the taking of possession of the Lease Premises or improvements thereon through a receiver or other means) require Leasehold Lender to assume, or cause Leasehold Lender to be deemed to have assumed, any obligation or liability of LESSEE under this Lease, and Leasehold Lender shall have no personal liability to LESSOR for LESSEE's failure to so perform and observe any agreement, covenant or condition of LESSEE under this Lease, it being expressly understood and agreed that, in the event of any such failure of LESSEE to perform, LESSOR's sole and exclusive remedy with respect to Leasehold Lender shall be to terminate this Lease without any recourse or claim for damages against Leasehold Lender, provided that this Section 17(e) shall not relieve Leasehold Lender of the requirements under Section 17(b)(ii)(3) in the event that Leasehold Lender has elected to acquire LESSEE's interests in this Lease and/or the Leased Premises.

(f) Permitted Transfers. Notwithstanding the provisions of Section 17(e), but for the avoidance of doubt while reserving LESSOR's right to terminate this Lease pursuant to Section 17(b), the purchaser at any sale of this Lease and the interests in and to the Leased Premises thereby created in any proceedings for the foreclosure of the Leasehold Mortgage (including, without limitation, power of sale), or the assignee or transferee of this Lease and the interests in and to the Leased Premises thereby created under any instrument of assignment or transfer in lieu of the foreclosure (whether to Leasehold Lender or any third party) shall be deemed to be a permitted assignee or transferee under this Lease without the need to obtain LESSOR's consent under Section 13 of this Lease and LESSOR shall recognize such assignee or transferee as the successor-in-interest to LESSEE for all purposes under this Lease, and such purchaser, assignee or transferee shall be deemed to have agreed to perform all of the terms, covenants and conditions on the part of LESSEE to be performed under this Lease from and after the date of such purchase and/or assignment, but only for so long as such purchaser or assignee is the owner of the LESSEE's interest in, to and under this Lease and the LESSEE's interests in and to the Leased Premises thereby created.

(g) No Termination for Casualty. So long as the indebtedness, or any part of the indebtedness, secured by the Leasehold Mortgage remains outstanding and unpaid, and the Leasehold Mortgage remains of record, LESSOR and LESSEE agree that the provisions of Section 9(a) shall not be amended, and shall control in the event of any by fire or other casualty of all, substantially all, or any part of the Leased Premises or the LESSEE's Facilities.

(h) Expropriation and Expropriation Proceeds. So long as the indebtedness, or any part of the indebtedness, secured by the Leasehold Mortgage remains outstanding and unpaid, and the Leasehold Mortgage remains of record, LESSOR and LESSEE agree that the provisions of Section 9(b) shall not be amended, and shall control in the event of a taking or expropriation pursuant to an eminent domain proceeding of all, substantially all, or any part of the Leased Premises, and further agree that: (1) any and all awards for any taking or expropriation of the Facilities and/or LESSEE's interest in, under and to this Lease which otherwise belong to LESSEE shall be payable to Leasehold Lender, to be disbursed as follows: (A) first, to

Leasehold Lender for the value of the interests in and to the Leased Premises created by this Lease and the value of the leasehold improvements located on the Leased Premises, up to an amount equaling the outstanding principal balance of any loan secured by the Leasehold Mortgage, and any interest accrued thereon, and (B) second, to LESSOR and LESSEE in accordance with this Lease; and (2) Leasehold Lender shall have the right to apply the expropriation proceeds payable to Leasehold Lender hereunder in accordance with the terms of the Leasehold Mortgage (or other applicable loan documents) and shall be entitled at Leasehold Lender's option to participate in any compromise, settlement or adjustment with respect to the claim for damages paid by the expropriating authority for the taking or expropriation of the Facilities and/or LESSEE's interest in, under and to this Lease; provided that this Section 17(h) does not derogate LESSOR's right to terminate this Lease pursuant to Section 17(b).

(i) New Direct Lease.

(i) If this Lease is canceled or terminated for any reason (except in connection with a Bankruptcy Proceeding, for which the provisions of Section 17(j) below are hereby agreed upon by LESSOR and LESSEE), and provided that Leasehold Lender has (A) commenced to cure and continues diligently to cure all non-payment defaults that are susceptible to being cured by Leasehold Lender with commercially reasonable diligence, and (B) cured any payment default in respect of any portion of Base Rent or Additional Rent, LESSOR hereby agrees that LESSOR shall, upon Leasehold Lender's written election within one hundred twenty (120) calendar days of such cancellation or termination, promptly enter in a new, direct lease with Leasehold Lender (or its nominee or any other party which Leasehold Lender may designate, including without limitation, LESSEE) with respect to the Leased Premises on the same terms and conditions as this Lease (a "New Lease"), it being the intention of the parties to preserve this Lease and the interests in and to the Leased Premises created by this Lease for the benefit of Leasehold Lender without interruption. Said New Lease shall be superior to all rights, liens and interests intervening between the date of this Lease and the granting of the New Lease and shall be free of any and all rights of LESSEE under this Lease.

(ii) LESSEE and LESSOR acknowledge and agree that Leasehold Lender shall have the right to encumber such direct New Lease and the estate created thereby with a deed of trust or a mortgage (as the case may be) on the same terms and with the same lien priority as the Leasehold Mortgage, it being the intention of the parties to preserve the priority of the Leasehold Mortgage, this Lease and the interests in and to the Leased Premises created by this Lease for the benefit of Leasehold Lender without interruption. If this Lease is rejected, cancelled or terminated for any reason and Leasehold Lender, its nominee or a designee of Leasehold Lender enters into a direct New Lease with LESSOR with respect to the Leased Premises, LESSOR hereby agrees that it will execute such documents as Leasehold Lender may require in order to ensure that the new direct lease provides for customary leasehold mortgagee protections, including without limitation, protections similar to those contained herein.

(j) Bankruptcy. In the event of a proceeding under the United States Bankruptcy Code (Title 11 U.S.C.) as now or hereafter in effect (a "Bankruptcy Proceeding"):

(i) If this Lease is rejected in connection with a Bankruptcy Proceeding by LESSEE or a trustee in bankruptcy (or other party to such proceeding) for LESSEE, such rejection shall be deemed an assignment by LESSEE to the Leasehold Lender of the Lease Premises and all of LESSEE's interest under this Lease, and this Lease shall not terminate and the Leasehold Lender shall have all rights and obligations of the LESSEE as if such Bankruptcy Proceeding had not occurred, unless Leasehold Lender shall reject such deemed assignment by notice in writing to LESSOR within thirty (30) calendar days following rejection of this Lease by LESSEE or LESSEE's trustee in bankruptcy. If any court of competent jurisdiction shall determine that this Lease shall have been terminated notwithstanding the terms of the preceding sentence as a result of rejection by LESSEE or the trustee in connection with any such proceeding, the rights of Leasehold Lender to a New Lease from LESSOR pursuant to Section 17(i) hereof shall not be affected thereby.

(ii) In the event of a Bankruptcy Proceeding against LESSOR:

(1) If the bankruptcy trustee, LESSOR (as debtor-in-possession) or any party to such Bankruptcy Proceeding seeks to reject this Lease pursuant to United States Bankruptcy Code §365(h)(1), LESSEE shall not have the right to treat this Lease as terminated except with the prior written consent of Leasehold Lender and the right to treat this Lease as terminated in such event shall be deemed assigned to Leasehold Lender, whether or not specifically set forth in the Leasehold Mortgage, so that the concurrence in writing of LESSEE and the Leasehold Lender shall be required as a condition to treating this Lease as terminated in connection with such Bankruptcy Proceeding.

(2) Unless this Lease is treated as terminated in accordance with Section 17(j)(ii)(1) above, then this Lease shall continue in effect upon all the terms and conditions set forth herein, including Rent, but excluding requirements that are not then applicable or pertinent to the remainder of the term of this Lease. Thereafter, LESSEE or its successors and assigns shall be entitled to any offsets against Rent payable hereunder for any damages arising from such bankruptcy, to the extent LESSEE's operation of business has been materially interfered with, and any such offset properly made shall not be deemed a default under this Lease. The lien of the Leasehold Mortgage shall extend to the continuing possessory rights of LESSEE following such rejection with the same priority as it would have enjoyed had such rejection not taken place.

(k) Estoppel Certificates.

(i) Upon Leasehold Lender's or LESSEE's written request, LESSOR shall provide Leasehold Lender or LESSEE with an estoppel certificate which shall certify to such requesting Leasehold Lender or LESSEE (1) as to the amount and status of all Rent payments and security deposits, if any, under this Lease, (2) as to the non-satisfaction or non-compliance by LESSEE of any other conditions under this Lease, or alternatively, as to the full satisfaction and compliance by LESSEE of any other conditions required under this Lease, (3) as to any existing default of LESSEE under the Lease, or alternatively that LESSEE is not in default in the payment, performance or observance of any other

condition or covenant to be performed or observed by LESSEE thereunder, (4) setting forth any offsets or counterclaims on the part of LESSOR or alternatively that there are no offsets or counterclaims on the part of LESSOR, and (5) as to such other matters related to this Lease as Leasehold Lender may reasonably determine from time to time.

(ii) Upon Leasehold Lender's or LESSOR's written request, LESSEE shall provide Leasehold Lender with an estoppel certificate which shall certify to such requesting Leasehold Lender (1) as to the amount and status of all Rent payments and security deposits under this Lease, (2) as to the non-satisfaction or non-compliance by LESSOR of any other conditions under this Lease, or alternatively, as to the full satisfaction and compliance by LESSOR of any other conditions required under this Lease, (3) as to any existing default of LESSOR under the Lease, or alternatively that LESSOR is not in default in the payment, performance or observance of any other condition or covenant to be performed or observed by LESSOR thereunder, (4) setting forth any offsets or counterclaims on the part of LESSOR or alternatively that there are no offsets or counterclaims on the part of LESSEE, and (5) as to such other matters related to this Lease as such Leasehold Lender may reasonably determine from time to time.

(l) No Merger. There shall be no merger of this Lease or any interest in this Lease or of the interests in and to the Leased Premises created thereby with the fee estate in the Leased Premises, by reason of the fact that this Lease or such interest therein, may be directly or indirectly held by or for the account of any person who shall hold any interest in the fee estate in the Leased Premises, nor shall there be such a merger by reason of the fact that all or any part of the interests in and to the Leased Premises created by this Lease may be conveyed or mortgaged in a leasehold mortgage, deed of trust, deed to secure debt or other equivalent instrument (as the case may be) to a mortgagee or beneficiary who shall hold any interest in the fee estate in the Leased Premises or any interest of LESSOR under this Lease.

(m) LESSOR's Recognition of LESSEE. LESSOR hereby recognizes LESSEE as the current tenant party to this Lease and acknowledges and agrees that LESSEE acquired its interest in this Lease and in and to the Leased Premises in accordance with the terms of this Lease.

(n) Agreement to Amend. LESSOR recognizes the importance of LESSEE's ability to obtain Leasehold Mortgages, and that the provisions of this Lease may be subject to the approval of a Leasehold Lender. If any Leasehold Lender should require, as a condition to such financing, any reasonable modifications of this Lease, whether for purposes of clarifying the provisions of this Lease or to include provisions then customary for leasehold financing transactions, LESSOR agrees to execute the appropriate amendments to this Lease; provided, however, that no such modification shall, to the detriment of LESSOR, impair any of LESSOR's rights, as reasonably determined by LESSOR or increase any of LESSOR's obligations, as reasonably determined by LESSOR, under this Lease.

(o) Third-Party Beneficiary. Notwithstanding anything to the contrary in this Lease, each Leasehold Lender shall be a third-party beneficiary solely and exclusively with respect to the provisions of this Section 17. There are no other third-party beneficiaries to this Lease.

(p) Subordination of LESSOR's Lien. LESSOR hereby subordinates any lien or privilege it may have on any movables found from time to time in or upon the Leased Premises, including without limitation, LESSOR's privileges pursuant to La. Civil Code Articles 2707, *et seq.*, to any Leasehold Lender's rights under this Section 17 and the lien of any Leasehold Mortgage.

(q) Letter of Credit. LESSOR's right to draw on the Letter of Credit in accordance with Section 18 below if LESSEE is in default under this Lease beyond applicable notice and cure periods shall not be limited by anything in this Section 17, even if the Leasehold Lender issues the Letter of Credit.

(r) No Waiver. Neither acceptance of Rent by LESSOR nor failure by LESSOR to complain of any action, non-action or default of LESSEE, whether singular or repetitive, shall constitute a waiver of any of LESSOR's rights hereunder. Waiver by LESSOR of any right pertaining to any default of LESSEE shall not constitute a waiver of any right for either a subsequent default of the same obligation or any other default. No act or thing done by LESSOR or LESSOR's agents shall be deemed to be acceptance of surrender of the Leased Premises and no agreement to accept a surrender of the Leased Premises shall be valid unless it is in writing and signed by LESSOR.

18. Parent Company Guaranty or Credit Support. Liquefied Natural Gas, Limited has executed this Lease below to guaranty, in full, all the obligations of LESSOR in favor of LESSOR in respect of LESSEE's obligations under this Lease. However, LESSEE shall be entitled, at any time on or after the Lease Commencement Date, to deliver to LESSOR (i) an irrevocable stand-by letter of credit in the form of Exhibit C, naming LESSOR as beneficiary, in an amount equal to the Required Amount as of such time, and issued by a Creditworthy Bank (a "Letter of Credit") or (ii) one or more replacement guarantees from Affiliates of LESSEE acceptable to LESSOR. If LESSEE delivers a Letter of Credit to LESSOR or such replacement guarantee, LESSOR shall execute a written termination and release of all of the obligations of Liquefied Natural Gas, Limited under its guaranty as soon as practicable (but, in any event within ten (10) calendar days) after LESSOR's receipt of the Letter of Credit or such replacement guarantee. LESSOR shall have the right to draw down on or collect against the Letter of Credit upon LESSOR's demand in the event that LESSEE has breached any of its obligations under this Lease and such breach has not been cured within the applicable cure period set forth in Section 12(a) in an amount not exceeding the LESSOR's damages for such breach. LESSOR shall not draw an amount on the Letter of Credit that is greater than the then outstanding unpaid amount that is the subject of such breach, and all amounts drawn under the Letter of Credit shall be deemed applied to such outstanding unpaid amount. If at any time, the amount available for drawing under a Letter of Credit exceeds the Required Amount at such time, then provided that LESSEE is not then in default beyond applicable notice and cure periods, LESSEE shall be entitled to reduce the available amount of the Letter of Credit to an amount at least equal to the Required Amount by submitting to the issuing bank a certificate in the applicable form attached to the Letter of Credit jointly signed by LESSEE and LESSOR, and LESSOR shall promptly execute such a certificate tendered by LESSEE if the foregoing condition to such reduction has been satisfied. If Lessee delivers a Letter of Credit and such Letter of Credit has a term that expires prior to the Expiration Date, then LESSEE shall, not less than forty five (45) calendar days prior to the expiring Letter of Credit's expiration date, deliver

a replacement Letter of Credit that is in an amount equal to the Required Amount or one or more guarantees from Affiliates of LESSEE acceptable to LESSOR and which, in each case, is effective on or before the expiration date of the expiring Letter of Credit. If LESSEE fails to deliver a replacement Letter of Credit not less than thirty (30) calendar days prior to the Expiration Date of the expiring Letter of Credit, then LESSOR may draw the entire balance of the expiring Letter of Credit and hold those funds as security to set off against any and all amounts owed or to be owed by LESSEE to LESSOR under this Lease, and LESSOR shall return any such funds not applied to amounts owed by LESSEE in the event that LESSEE provides a replacement Letter of Credit or replacement guarantee in accordance with the foregoing. In this Lease, "Creditworthy Bank" means a commercial bank having at the applicable time a senior unsecured and un-credit-enhanced long term debt rating of: (a) A- or better from Standard & Poor's Corporation (or any successor rating agency thereof); or (b) A3 or better from Moody's Investor Services, Inc. (or any successor rating agency thereof). In this Lease, "Required Amount" means, as of any date in any Contract Year, the amount opposite such Contract Year in Exhibit D. Any assignee of LESSEE shall be obligated to provide replacement credit support in accordance with this Section 18.

19. **Subleasing.** LESSEE shall have the right to sublease any or all of the Leased Premises, subject to the written consent of LESSOR, which consent shall not be unreasonably withheld, conditioned or delayed by LESSOR, provided that LESSEE is not in default beyond applicable notice and cure periods under this Lease. Unless specifically agreed and consented to by LESSOR, no such subleasing shall relieve LESSEE of LESSEE's obligations hereunder. In the event that LESSEE enters into any such sublease, at the request of the sublessee, LESSOR shall enter into a direct agreement with such sublessee, (a) providing that if this Lease is cancelled or terminated, LESSOR shall enter into a direct New Lease with such sublessee for the balance of the term of this Lease and otherwise on substantially the same terms and conditions as this Lease, and (b) containing lender provisions substantially similar to those set forth in Section 17.

20. **Memorandum.** At LESSEE's option, LESSOR and LESSEE shall each execute and have acknowledged a memorandum of this Lease as of the Lease Commencement Date, and LESSEE shall cause the executed and acknowledged memorandum to be recorded in the Official Records.

21. **Authority.** Each party to this Lease represents and warrants to each other party to this Lease that (a) the representing party has the unrestricted right, power and authority to execute, deliver and perform this Lease and to enter into this Lease as contemplated hereunder, (b) the person signing this Lease on behalf of the representing party is authorized to do so, (c) the representing party has taken all governmental (in the case of any party that is a public entity) or company (in the case of any party that is a private entity) actions necessary to authorize the execution, delivery and performance of this Lease, (d) the performance by the representing party of its duties, obligations and responsibilities under this Lease will not violate or constitute a default under the terms and provisions of its charter, articles of organization or operation agreement, any applicable law, or any material agreement, document or instrument to which it is a party or by which it or the Leased Premises are bound or affected, (e) no further consent of any person or entity is required in connection with the representing party's execution, delivery or performance of this Lease, (f) when signed by the representing party, this Lease constitutes a valid and binding agreement enforceable against such party in accordance with its terms (except

as such enforcement may be limited by the effect of bankruptcy, insolvency, reorganization, receivership, conservatorship, moratorium or other applicable laws relating to the rights of creditors generally, or the rules governing the availability of specific performance, injunctive relief or other equitable remedies and general principles of equity, regardless of whether considered a proceeding in equity or at law). The District further represents and warrants to LESSEE that it is not immune from suit or judgment resulting from any claim or action brought against it by the LESSEE pursuant to the express terms of this Lease.

22. **Governing Law and Venue.** This Lease shall be governed by and interpreted in accordance with the laws of the State of Louisiana, excluding conflicts of laws principles. If the parties are unable to resolve amicably any dispute arising out of or in connection with this Lease, they agree that, if permitted under applicable laws, such dispute shall be resolved in the state or federal courts located in Lake Charles, Louisiana

23. **Alternative Dispute Resolution.**

(a) *Executive Officers Meetings.* As a condition precedent to instituting any lawsuit relating to any claim, controversy or dispute arising under this Lease (a “Dispute”), the parties each agree to appoint an executive officer as its representative to resolve such dispute, and that such representatives must personally meet at a mutually acceptable date, time and location within fifteen (15) calendar days following the request of either party, in a good faith effort to resolve the dispute or disagreement. If such executive officer representatives cannot resolve the dispute, then each party agrees that the parties’ chief executive officers shall similarly meet personally at a mutually acceptable date, time and location within fifteen (15) calendar days following the meeting of representatives, in a good faith effort to resolve the dispute or disagreement. Failure of either party to timely attend such meeting shall constitute a breach of this Lease and, in such event, the condition precedent to initiating any litigation shall be deemed satisfied or waived.

24. **Entire Lease.** This Lease constitutes the entire agreement between LESSOR and LESSEE respecting the subject matter of this Lease. Any agreement, understanding or representation respecting the Leased Premises, this Lease, or any other matter referenced herein not expressly set forth in this Lease or a subsequent writing signed by both parties is null and void. This Lease shall not be modified or amended except in a writing signed by both parties. No purported modifications or amendments, including without limitation any oral agreement (even if supported by new consideration), course of conduct or absence of a response to a unilateral communication, shall be binding on either party.

25. **Counterpart Signatures.** This Agreement may be executed with counterpart signature pages and in duplicate originals, each of which shall be deemed an original, and all of which together shall constitute a single instrument.

26. **26. Force Majeure.** In the event that LESSEE shall be delayed or hindered in or prevented from the performance of any act required hereunder (other than payment of Base Rent or Additional Rent) by reason of any event that is outside the reasonable control of LESSEE, including, but not limited to, strikes, lock-outs, labor troubles, inability to procure materials, failure of power, restrictive governmental laws or regulations, changes in governmental laws or

regulations, delay in obtaining permits beyond the time periods for obtaining permits that existed as of the Lease Commencement Date (provided that such delay did not result from failure of LESSEE to comply with the clear requirements of the permitting office), riots, insurrection, civil unrest, war, terrorist act, act of a public enemy, sabotage, blockade, embargo, hurricane, fire, flood, tornado, earthquake, storm, lightning, washout, explosion, or other reason of a like nature not the fault of the party delayed in performing work or doing acts required under the terms of this Lease (“Force Majeure Event”), then performance of such act shall be excused temporarily but shall accrue during the period of the delay and the period for the performance of any such act shall be extended for a period equivalent to the period of such delay. The provisions of this Section 26 shall not relieve LESSEE of any of its other obligations hereunder nor operate to excuse LESSEE from prompt payment of all Base Rent or Additional Rent. Notwithstanding anything to the contrary contained in this Lease, in the event of a Force Majeure Event, the prolonged effects of which prevent the commercially reasonable use of the Leased Premises or the Facilities (or the construction or reconstruction of the Facilities following a casualty or Force Majeure Event), for more than twelve (12) consecutive months, then LESSEE shall have the right to terminate this Lease by giving notice to LESSOR. **Relationship of Parties.** Nothing contained in this Lease and no course of dealing between the parties shall be construed so as to constitute a joint venture or partnership between LESSOR and LESSEE.

27. **Successors.** The covenants, agreements, terms, provisions and conditions contained in this Lease shall apply to and inure to the benefit of and be binding upon the LESSOR and the LESSEE and their respective successors and assigns, and shall be construed as covenants running the respective interests of the parties hereto.

28. **Severability.** If any term or provision of this Lease is found to be invalid, illegal or unenforceable, the remaining terms and provisions hereof will not be affected thereby; and each term and provision hereof will be valid and enforceable to the fullest extent permitted by law.

29. **Headings.** The captions, section numbers and paragraph numbers appearing in this Lease are inserted only as a matter of convenience and in no way define, amplify, limit, construe or describe the scope or interest of any section of this Lease.

30. **Intentionally omitted.**

31. **No Waiver.** The failure of either party to exercise any power given to it hereunder, or to insist upon strict performance of any one or more of the obligations under this Lease, or to exercise any election contained in this Lease, shall not be construed as a waiver or relinquishment of the right to demand strict compliance with the terms hereof for the future performance of the terms and conditions of this Lease or of the right to exercise such election.

[Signatures on following pages]

EXECUTED this _____ day of _____, 2013.

WITNESSES:

LAKE CHARLES HARBOR AND
TERMINAL District

Print Name: _____

By: _____
William J. Rase, III, Executive Director

Print Name: _____

WITNESSES:

MAGNOLIA LNG, LLC

Print Name: _____

By: _____
Name: _____
Title: _____

Print Name: _____

WITNESSES:

Liquefied Natural Gas, Limited

By: _____
Name: _____
Title: _____

STATE OF LOUISIANA

PARISH OF _____

On this ____ day of _____, 2013, before me appeared William J. Rase, III, to me personally known, who, being by me duly sworn, did say that he is the Executive Director for LAKE CHARLES HARBOR AND TERMINAL District, and that the foregoing instrument was signed in behalf of said entity by authority of its Board of Commissioners, and said appearer acknowledged said instrument to be the free act and deed of said entity.

NOTARY PUBLIC

Printed Name: _____

Bar Roll/Notary No.: _____

Commission Expires: _____

STATE OF _____ :

COUNTY OF _____ :

On _____ before me, _____, Notary Public, personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of _____ that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____

(Seal)

NOTARY PUBLIC

Printed Name: _____

Bar Roll/Notary No.: _____

Commission Expires: _____

Exhibit A

Legal Description of Leased Premises

Exhibit B

Corps letter – Dated January 25, 1994



DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT CORPS OF ENGINEERS

P.O. BOX 60267

NEW ORLEANS, LOUISIANA 70160-0267

January 25, 1994

EXHIBIT B

REPLY TO
ATTENTION OF:

Operations and Readiness Division
Surveillance and Enforcement Section

Mr. Ulysses J. de St. Germain, Jr.
Lake Charles Harbor & Terminal District
Post Office Box AAA
Lake Charles, Louisiana 70620-0AAA



Dear Mr. de St. Germain:

This is with reference to your letter of December 30, 1993, raising several questions regarding the Industrial Canal South Shore, (Devil's Elbow) area in Calcasieu Parish, Louisiana, as indicated on the attached map.

In response to the various points you raised, we have the following comments:

1. Is the site currently a designated Corps spoil disposal area with easements in effect? While it is true that the Corps did utilize this area for spoil disposal previously, we now have no need for further deposition there. We are currently making use of other sites for spoil disposal. The Corps has no spoil disposal easements on this site.

2. Do official jurisdictional determinations exist for the site other than for the extreme western end which is presently leased to the Marine Spill Response Corporation (MSRC)? Our letter of October 6, 1993, authorizing the installation of additional culverts, the excavation and improvement of existing drainage ditches, and the grading of surface undulations for tractor access without a permit under either Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act of 1899 is in effect a determination that jurisdictional wetlands do not occur on the site except for the extreme western end which is presently leased to the MSRC, and for which a permit has been issued.

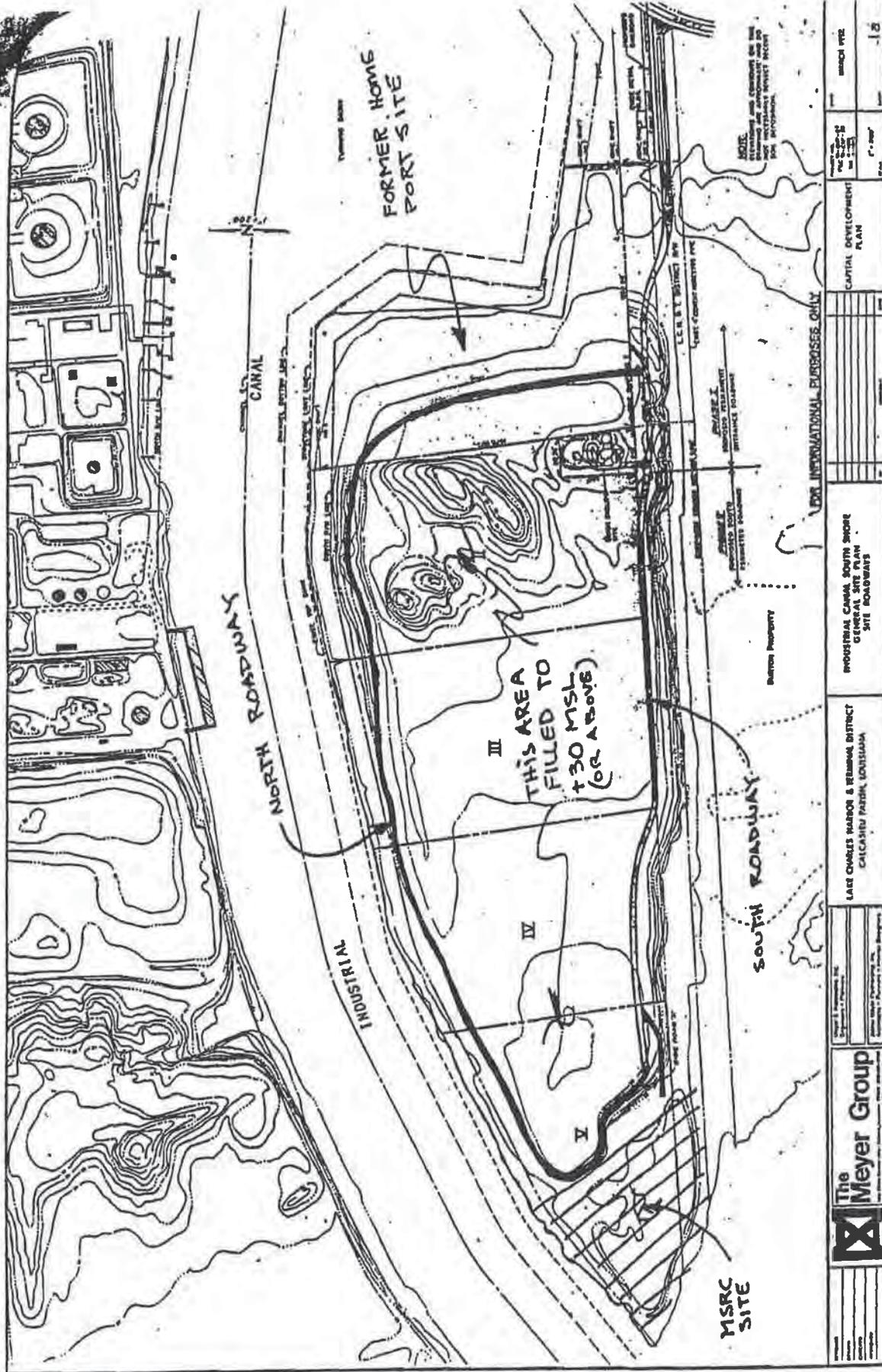
3. Do permits exist for work at the site other than that obtained by the MSRC? A search of our files reveals that the only permit that has been issued for this site is the one to the MSRC.

Should you have any questions regarding this matter, please contact Thom Davidson at the above address or by phone at (504) 862-2270.

Sincerely,

Ronald J. Ventolaja
Chief, Regulatory Functions Branch

Enclosure



		LARZ CHARGES MARCOB & REMANA DISTRICT CALCUTTA PRADEK, INDIA	INDUSTRIAL CANAL SOUTH SHORE GENERAL SITE PLAN SITE ROADWAYS	CAPITAL DEVELOPMENT PLAN	SHEET NO. 18 OF 18
--	--	---	--	-----------------------------	-----------------------

December 30, 1993

U.S. Army Corps of Engineers
Permits Section
P.O. Box 60267
New Orleans, LA 70160

ATTN: Mr. Ronald Ventola

RE: Industrial Canal South Shore (Devil's Elbow)

Dear Mr. Ventola,

This letter is to acknowledge your letter of October 6, 1993 (copy attached) which indicated a permit was not required for various improvements at the above subject site. Since receiving your letter, several issues have surfaced which the District feels require clarification.

The Industrial Canal was dredged a number of years ago and has been maintained by the Corps. The District's files contain limited information about the project in general and particularly as it relates to the site in question. The site has been used in the past as a spoil disposal area and the eastern end was to be a Navy home port prior to the Base Closure and Realignment Act of 1988. However, it is not clear if the site is currently a designated disposal area or if any easements for this use are still in effect.

The majority of the site has been filled 20 to 30 feet with spoil material above its original elevation of +10 MSL. However, our records do not indicate if a wetland delineation has been made to determine if the site and/or any portions thereof are jurisdictional wetlands with the exception of the extreme western end which was recently leased to the Marine Spill Response Corporation (MSRC). This portion of the site was at or near its original average elevation of +10 MSL and was considered a jurisdictional wetland.

The District is in the process of reviewing its long term development options for various properties. Major considerations include past uses, present permitted uses, proposed uses and regulatory constraints that would be associated with developing the properties. Based thereon, any historical file information you could furnish on this site which would clarify the above concerns would be most helpful.



**Lake Charles
Harbor
& Terminal
District**

Post Office Box AAA
Lake Charles, LA 70602
Phone 318-439-3661
Facsimile 318-493-3523

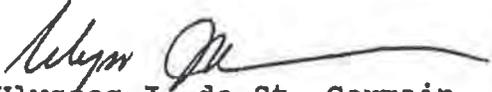
Ulysses J. de St. Germain, Jr.
Executive Director

U. S. Army Corps of Engineers
Page 2
December 30, 1993

Please advise if the site, as shown on the attached drawing, has any areas other than the MSRC area which would be considered jurisdictional wetlands under Section 404 of the Clean Water Act. Additionally, please advise whether or not the site is a dedicated spoil area and if so, whether the Corps would consider releasing the dedication.

Please advise if you have any questions or require any additional information.

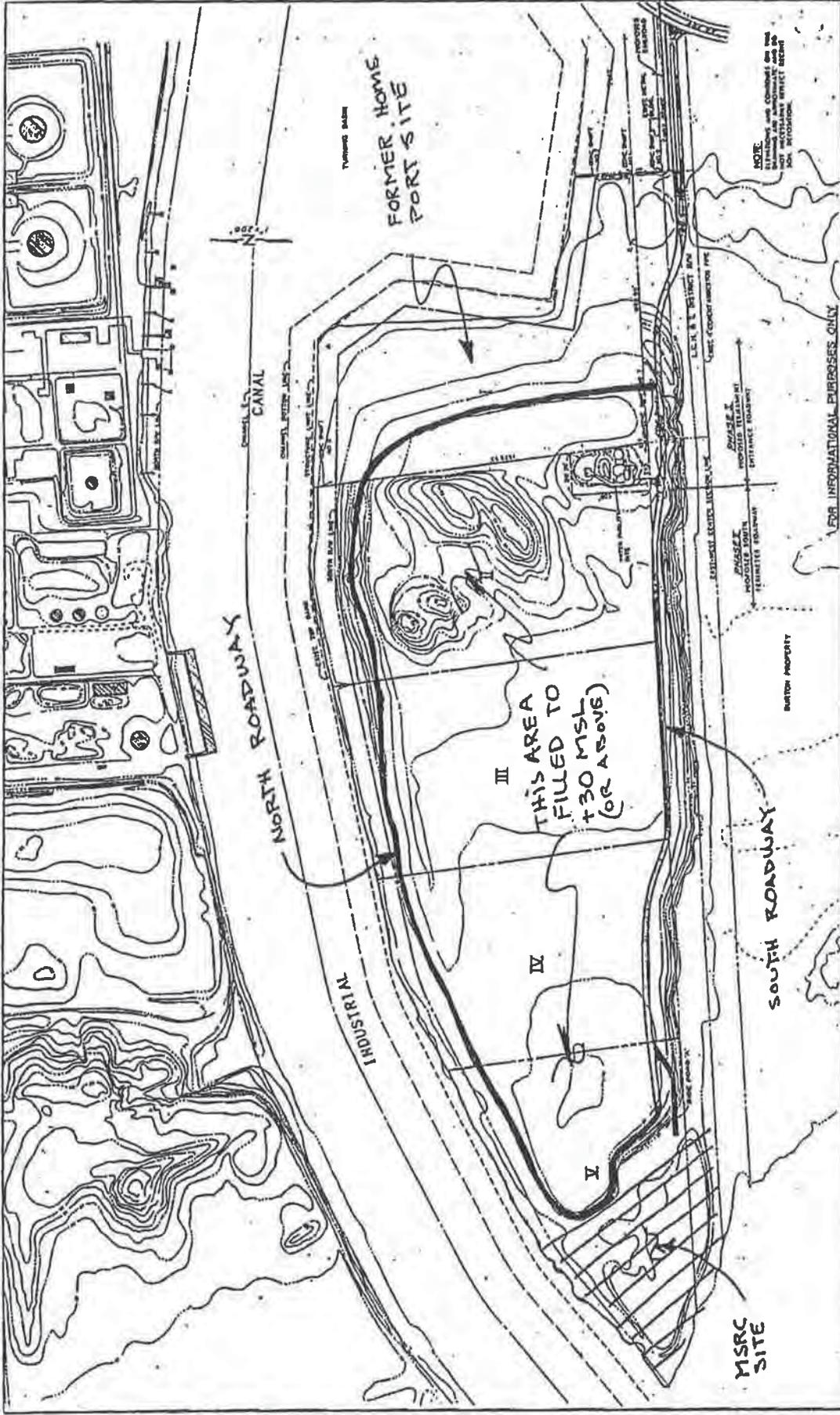
Sincerely,


Ulysses J. de St. Germain, Jr.

USG:lsm

Attachment





		LAKE CHARLES HARBOR & TERREMIN DISTRICT CALCASIEU PARISH, LOUISIANA		INDUSTRIAL CANAL SOUTH SHORE GENERAL SITE PLAN SITE ROADWAYS		CAPITAL DEVELOPMENT PLAN		DATE: MARCH 1978	
PROJECT NO. 10-100		SHEET NO. 12		SCALE: 1" = 100'		DRAWN BY:		CHECKED BY:	



DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS

P.O. BOX 60267

NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF

October 6, 1993



Operations & Readiness Division
Surveillance & Enforcement Section

Mr. John Polansky
Lake Charles Harbor & Terminal
Post Office Box AAA
Lake Charles, Louisiana 70602-0AAA

Dear Mr. Polansky:

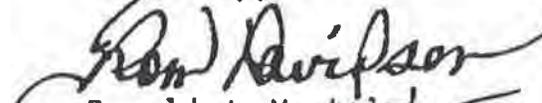
This is in regard to your letter of July 14, 1993, requesting a jurisdictional determination for your project to install additional culverts, excavate and improve existing ditches and grade undulations for tractor access in the spoil disposal area indicated on the attached map of the Industrial Canal, South Shore of the Lake Charles Harbor and Terminal District in Calcasieu Parish, Louisiana.

We have reviewed the information you have provided regarding this project, and have determined that no permit from the U.S. Army Corps of Engineers under either Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act of 1899 is required for this work.

This determination is only applicable to the permit program administered by the Corps of Engineers. It does not eliminate the need to obtain other Federal, state or local approvals before beginning the work.

Should you have any questions regarding this matter, please contact Thom Davidson at (504) 862-2270.

Sincerely,


Ronald J. Ventola
Chief, Regulatory Functions Branch

Enclosure

④
ICSS

July 14, 1993

U. S. Army Corps of Engineers
Permits Section
P. O. Box 60267
New Orleans, LA 70160

Attn: Mr. Ronald Ventola

RE: Maintenance of Dredged Material Disposal Area

Dear Mr. Ventola:

This letter is to provide you with the planned scope of maintenance of the dredged material disposal area on the south shore of the Industrial Canal (Devil's Elbow) and to request guidance relative to permit requirements for the planned activity.

As shown on the attached drawing, the site was used for disposal of dredged material from the Industrial Canal with an average elevation of +30 MSL. It was to be one of the Navy's home port facilities prior to the Base Closure and Realignment Act of 1988. The subsequent closure of the facility has resulted in the maintenance of the area resting with the District.

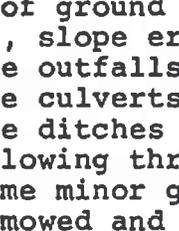
The District has previously received approval from your office to construct and maintain access roads around the perimeter of the site. These roads were constructed on top of the perimeter levee which was constructed at an elevation approximately two (2) feet higher than the surface of the dredged material. Due to this elevation differential, the site held water and, according to Parish officials, added significantly to the mosquito population. The construction of the roads and the associated drainage improvements have significantly reduced the amount of standing water which has eliminated most large breeding areas. Regular mowing of accessible areas has aided the growth of ground cover which has reduced surface cracking and eliminated additional breeding areas.



Lake Charles
Harbor
& Terminal
District

Post Office Box AAA
Lake Charles, LA 70602
Phone 318-439-3661
Telex 502449 Portlkchas
Facsimile 318-493-3523

Mr. Ronald Ventola
U. S. Army Corps of Engineers
Page 2
July 14, 1993



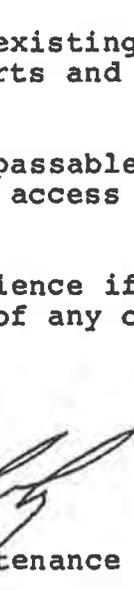
In addition to the above, the underlying dredged material has a high moisture content and in some areas is unstable. Based upon this condition, the District is concerned about the integrity of sections of the perimeter levee. Regular mowing of the levee slopes has aided the growth of ground cover which has reduced sloped erosion. However, slope erosion has been experienced at several drainage outfalls. To eliminate the erosion, additional drainage culverts through the levee and interconnecting drainage ditches are necessary to reduce the volume of water flowing through any one culvert. This work, along with some minor grading, will improve the site so that it can be mowed and properly drained.

Based upon the foregoing and as discussed with Mr. Serio, the following specific items of work are planned.

1. Install additional culverts through the perimeter levee.
2. Excavate new ditches and improve existing ditches to interconnect the culverts and balance flow rates.
3. Grade undulations at localized impassable areas to the extent necessary to enable access for tractor mounted mowers.

Please advise at your earliest convenience if any permits will be necessary for this work or of any other limitations.

Sincerely,



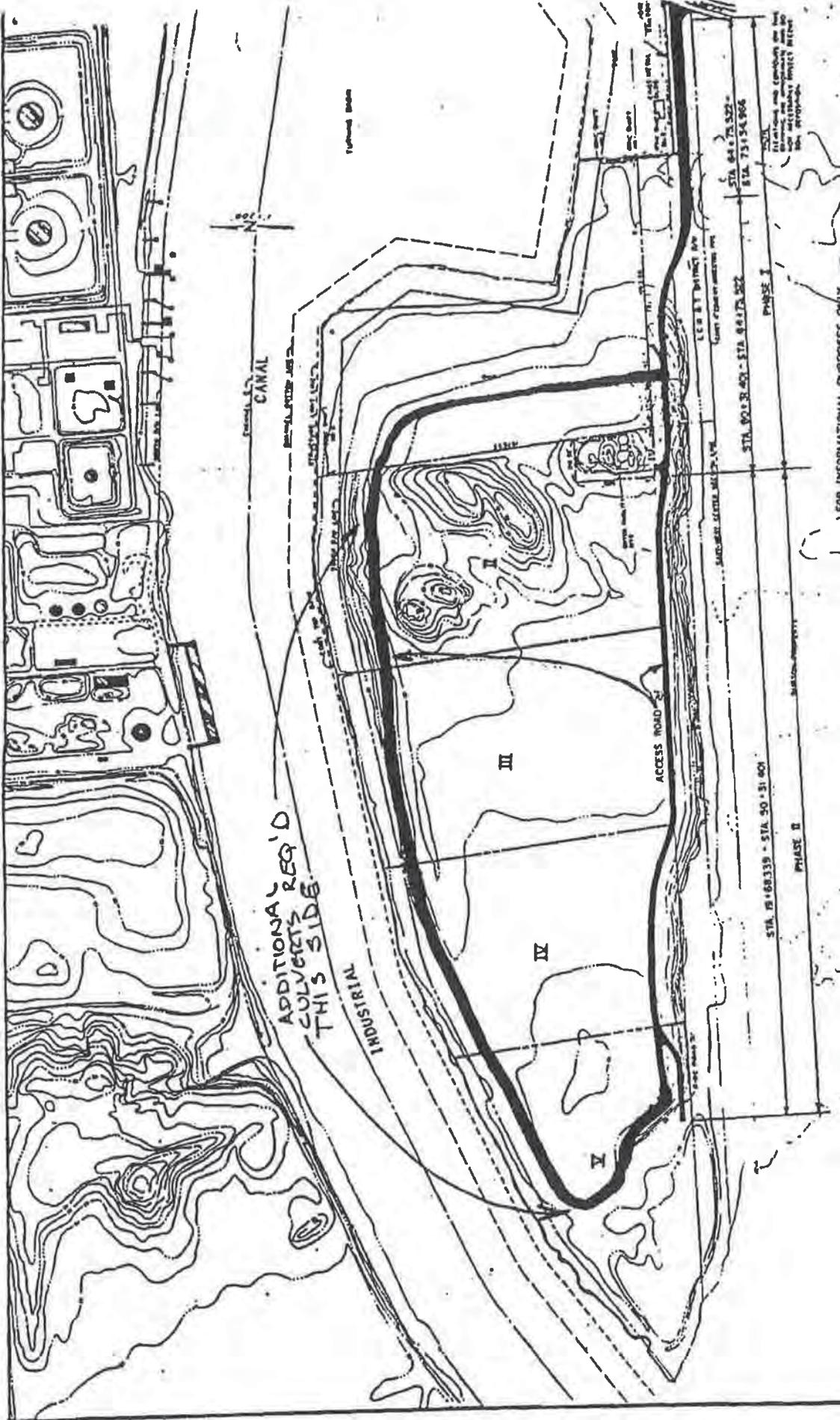
John Polansky
Director of Maintenance

✓JP:lsm

Attachment

CC: Mr. Ulysses J. de St. Germain, Jr.
Executive Director

Mr. Michael K. Dees
General Counsel



		LAKE CHARLES HARBOR & TERMINAL DISTRICT CALCASIEU PARISH, LOUISIANA		INDUSTRIAL CANAL SOUTH SHORE GENERAL SITE PLAN SEE ROADWAYS		CAPITAL DEVELOPMENT PLAN		DATE: 12-15-10 DRAWN BY: J.S.B. CHECKED BY: P. J. BERRY		SHEET NO. 10	
FOR INFORMATIONAL PURPOSES ONLY											



DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

(f)
91CIP3/38



REPLY TO
ATTENTION OF:

March 31, 1992

Operations & Readiness Division
Surveillance & Enforcement Section

Mr. Charles W. Stutes
Meyer and Associates
Post Office Box 2149
Sulphur, Louisiana 70664-2149

Dear Mr. Stutes:

This is in regard to your letter of March 13, 1992, concerning the proposed project of your client, the Lake Charles Harbor and Terminal District, to make roadway improvements to existing access roads located along the south property line of the site. We understand that Phase I improvements will generally consist of earthwork necessary to provide a suitable alignment and grade within acceptable design standards, placement of geotextile fabric, a stone base course and PCC pavement. Phase II improvements will generally consist of a minimal grading and leveling, placement of geotextile fabric, and placement of a limestone surface course.

Based on a review of the information you have provided, we have determined that no permit is required from the US Army Corps of Engineers for the work your client proposes.

This determination is only applicable to the permit program administered by the Corps of Engineers. It does not eliminate the need to obtain other Federal, state or local approvals before beginning the work.

Should you have any questions regarding this matter, please contact Dr. Thom Davidson at (504) 862-2270.

Sincerely,

Ronald J. Ventola
Chief, Regulatory Functions Branch
Operations and Readiness Division

(2)



Meyer and Associates, Inc.
Engineers • Planners

Vernon F. Meyer, P.E.
President
Richard T. Meyer, P.E.
Vice-President

March 13, 1992

U. S. Army Corps of Engineers
Post Office Box 60267
New Orleans, LA 70160-0267

ATTENTION: MR. RONALD J. VENTOLA, CHIEF
REGULATORY FUNCTIONS BRANCH
OPERATIONS READINESS DIVISION

Re: Lake Charles Harbor and Terminal District
Access Roadway at Industrial Canal
South Shore, Phase I and II
PLC No. 91-CIP-37 and 38
MA Project No. 4-10113, 4-10123

Gentlemen:

This letter is to advise you of additional planned improvements at the Industrial Canal South Shore and request review and approval of the work described herein. On January 21, 1992, Mr. John Polansky, Director of Maintenance at the Lake Charles Harbor and Terminal District, forwarded a letter to your office advising you of work proposed at the site. On January 27, 1992, your office provided written confirmation that no Corps permit was necessary for the required work. As consulting engineers for the Lake Charles Harbor and Terminal District, Meyer and Associates, Inc. have prepared plans for additional roadway improvements to the existing access roads located along the south property line of the site. Provided herewith is a site plan and typical sections of the proposed roadway improvements.

Roadway improvements will consist of two phases.

Phase I improvements (parallel to existing Navy limestone access road) will generally consist of earthwork necessary to provide a suitable alignment and grade within acceptable design standards, placement of geotextile fabric, stone base course and PCC pavement. Ditches and culverts along the roadway will be constructed to provide required roadway drainage.

Phase II improvements (parallel to existing unsurfaced access road) will generally consist of a minimal grading and leveling, placement of geotextile fabric, and placement of limestone surface course. Ditches and culverts will be constructed to provide required roadway drainage.

March 13, 1992 4-10113/4-10123 (#63) Meyer and Associates, Inc.

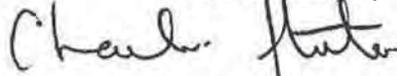
U. S. Army, Corps of Engineers
March 13, 1992
Page Two

Any excess materials will be deposited and spread along the existing perimeter levee slopes.

Please advise our office of you determination at your earliest opportunity. If you have any questions, please advise.

Yours very truly,

MEYER AND ASSOCIATES, INC.



Charles W. Stutes, P. E.

CWS:tb

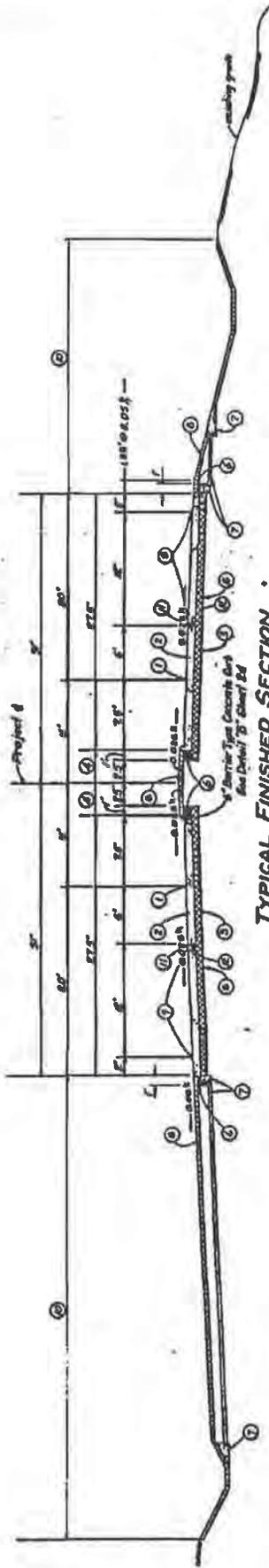
cc: Mr. John Polansky, Jr.





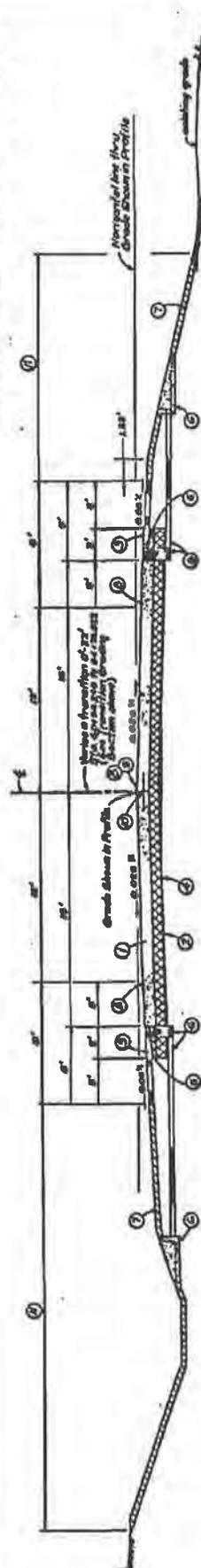
		LALE CHARLES HARBOR & TERREMINA DISTRICT CALCASIEU PARISH, LOUISIANA		INDUSTRIAL CANAL SOUTH SHORE GENERAL SITE PLAN SITE ROADWAYS		CAPITAL DEVELOPMENT PLAN		DATE: MARCH 1974 SCALE: 1" = 100'	
PROJECT NO. 100-1000-1000-1000 DRAWING NO. 100-1000-1000-1000		SHEET NO. 100-1000-1000-1000 TOTAL SHEETS 100-1000-1000-1000		DESIGNER: [Name] CHECKED: [Name]		DATE: [Date] SCALE: [Scale]		PROJECT NO. 100-1000-1000-1000 DRAWING NO. 100-1000-1000-1000	

FOR INFORMATIONAL PURPOSES ONLY



TYPICAL FINISHED SECTION
 STA. 64+75.622 to STA. 71+84.900

- LEGEND**
- ① Gravel Course (8" Thick)
 - ② Base Course (5" Thick) (3% Thick)
 - ③ Aggregate Surface Course (5" Thick) (4" Thick) (Net Section)
 - ④ Geotextile Fabric
 - ⑤ Embankment (20000 Cu. Yds. per Lin. Ft. inside, 0.0000 Cu. Yds. per Lin. Ft. outside, One side of Section)
 - ⑥ Underdrain System and Outlets
 - ⑦ Top Soil (2" Thick)
 - ⑧ Plastic Pavement Striping (6" Width)
 - ⑨ Limits of Seeding, Fertilizer, Mole, and Excavator Marking
 - ⑩ Reflectored Raised Pavement Markers (Class II)
 - ⑪ Longitudinal Construction Joint or Longitudinal Joint



TYPICAL FINISHED SECTION
 STA. 60+81.401 to STA. 64+75.622

- LEGEND (cont'd)**
- ② Top Soil (2" Thick)
 - ③ Plastic Pavement Striping (6" Width)
 - ④ Reflectored Raised Pavement Markers (Class II)
 - ⑤ Longitudinal Construction Joint or Longitudinal Joint
 - ⑥ Limits of Seeding, Fertilizer, Mole, and Excavator Marking

NOTE: Contractor shall provide a plan showing a detailed layout of all points, and this plan shall be approved by the Project Engineer prior to any field construction.

- LEGEND**
- ① Portland Cement Concrete Pavement (8" Thick)
 - ② Base Course (5" Thick) (3% Thick)
 - ③ Aggregate Surface Course (5" Thick) (4" Thick) (Net Section)
 - ④ Geotextile Fabric
 - ⑤ Embankment (20000 Cu. Yds. per Lin. Ft. one side of section)
 - ⑥ Underdrain System

<p>The Meyer Group 1000 West 10th Street, Suite 200, Lincoln, NE 68502 (402) 441-1000</p>	PHASE I		PROJECT NO.	DATE
	REVISIONS BY DATE	EDITIONS BY DATE	NTS. SCALE	8443



DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS

P.O. BOX 60267

NEW ORLEANS, LOUISIANA 70160-0267

91-011

REPLY TO
ATTENTION OF:

January 27, 1991

Operations & Readiness Division
Surveillance & Enforcement Section

Mr. John Polansky, Jr.
Lake Charles Harbor & Terminal District
Post Office Box AAA
Lake Charles, Louisiana 70602-0AAA

Dear Mr. Polansky:

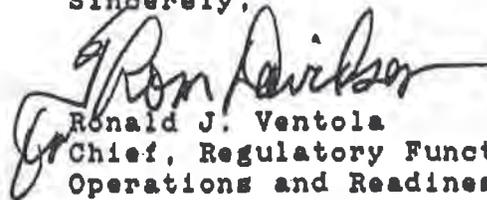
This is in regard to your letter of January 21, 1992, concerning your proposed project for access improvements at the Industrial Canal South Shore which you identify as Project No. 91-011. We understand the project to involve minor grading of the existing containment levees to remove ruts and other surface irregularities, the placement of geotextile fabric, and the placement and compaction of crushed limestone. Culverts will be placed to provide adequate drainage at various locations.

Based on a review of the information you have provided, we have determined that this work does not involve depositing fill in a wetland as you have designed it, therefore, it will not require a permit from the U.S. Army Corps of Engineers.

This determination is only applicable to the permit program administered by the Corps of Engineers. It does not eliminate the need to obtain other Federal, state or local approvals before beginning the work.

Should you have any questions regarding this matter, please contact Dr. Thom Davidson at (504) 862-2270.

Sincerely,


Ronald J. Ventola
Chief, Regulatory Functions Branch
Operations and Readiness Division



②

January 21, 1992

U. S. Army Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160-0267

Attention: Mr. Ronald J. Ventola
Chief, Regulatory Functions Branch
Operations & Readiness Division

Re: Access Improvements at the
Industrial Canal South Shore
Project No. 91-011
Perimeter Access Road - ICSS

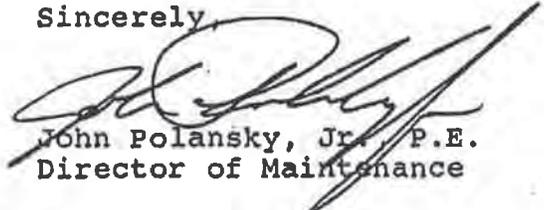
Gentlemen:

This letter is to advise you of planned access improvements at the ICSS and to request approval of the work described herein and on the attached drawing. The work includes minor grading of the existing containment levees to remove ruts and other surface irregularities; placement of geotextile fabric; and placement and compaction of crushed limestone. Culverts will also be placed to provide drainage at various locations.

Earth work will be confined to the perimeter of the site and does not include placement of any fill material other than surfacing aggregate. Any excavated materials will be deposited and spread along the existing levee slopes.

Please advise this office of your determination at your earliest opportunity.

Sincerely,



John Polansky, Jr. P.E.
Director of Maintenance

JP:hd

Attachment



Lake Charles
Harbor
& Terminal
District

Post Office Box AAA
Lake Charles, LA 70602
Phone 318-439-3661
Telex 502449 Portlkchas
Facsimile 318-493-3523

Exhibit C

Form of Letter of Credit

Date: [INSERT DATE]

IRREVOCABLE STANDBY LETTER OF CREDIT NUMBER: [INSERT LETTER OF CREDIT NUMBER]

BENEFICIARY [LAKE CHARLES HARBOR AND TERMINAL District] [ADDRESS]	APPLICANT [CAMMERON LNG, LLC] [ADDRESS]
	AMOUNT USD \$[AMOUNT IN NUMBERS] [AMOUNT IN WORDS] US Dollars
	EXPIRATION DATE: [INSERT DATE] at our counter

We, [NAME OF ISSUING BANK], hereby establish our Irrevocable Standby Letter of Credit No. [INSERT LETTER OF CREDIT NUMBER] (this "Letter of Credit") for account of [NAME OF APPLICANT] in favor of LAKE CHARLES HARBOR AND TERMINAL District (the "Beneficiary") for an aggregate amount of USD [AMOUNT IN NUMBER AND WORDS] (THE "L/C Amount").

The L/C Amount is available for one or more drawings under this Letter of Credit by presentation by the Beneficiary to us of a demand for a payment under this Letter of Credit in the form of the Schedule I to this Letter of Credit (a "Demand").

Each Demand under this Letter of Credit is presentable at our office at:

[]
Attn: []

Subject to the terms of this Letter of Credit, we unconditionally and irrevocably undertake to the Beneficiary that, within ten (10) calendar days of receipt by us of a Demand, we shall pay to the Beneficiary the amount demanded in that Demand, provided that we shall not be obliged to make a payment under this Letter of Credit if as a result the aggregate of all payments made by us under this Letter of Credit would exceed the L/C Amount. Payment of a Demand under this Letter of Credit will be made by wire transfer of immediately federal funds to such account as Beneficiary may designate in the Demand. As used in this Letter of Credit the term "Business Day" means a day other than a Saturday, Sunday or any other day on which banking institutions in the state of [New York] are authorized or required by law to close.

Upon our receipt of a reduction notice (a “Reduction Notice”) in the form of Schedule II to this Letter of Credit, the L/C Amount shall be permanently reduced by the amount stated in such Reduction Notice.

All bank charges, including, but not limited to, fees or commissions shall be for the account of Applicant.

We hereby undertake that we will not modify, revoke or terminate this Letter of Credit without the Beneficiary’s written consent.

We will be released from our obligations under this Letter of Credit on the date (if any) notified by the Beneficiary to us as the date upon which our obligations under this Letter of Credit are released. Unless previously released under the immediately preceding sentence, on [INSERT DATE] [a.m/p.m.] [INSERT TIME ZONE] on [INSERT EXPIRATION DATE], our obligations under this Letter of Credit will cease with no further liability on our part except for any Demand validly presented under the Letter of Credit that remains unpaid; provided, however, that this Letter of Credit shall be deemed to have been automatically extended without amendment for an additional twelve (12) month period from such expiration date, and, thereafter, annually, from the then current expiration date unless we have notified the Beneficiary in writing at least sixty (60) calendar days prior to the then current expiration date that this Letter of Credit will not be extended; provided further that, in the event of an act of God, riot, civil commotion, insurrection, war or any other causes beyond our control that interrupts our business (collectively a “Force Majeure Event”) and causes the place for presentation of Demands under this Letter of Credit to be closed for business on the then current expiration date of this Letter of Credit, then such expiration date of this Letter of Credit will be automatically extended without amendment to the thirtieth calendar day after the date on which the place for presentation reopens for business.

This Letter of Credit shall be surrendered to us promptly after its expiration.

This Letter of Credit shall be governed by, and construed in accordance with, the terms of the Uniform Customs and Practice for Documentary Credits (2007 Revision), International Chamber of Commerce Publication No. 600 (the “Uniform Customs”), except to the extent that the terms hereof are inconsistent with the Uniform Customs. As to matters not governed by the Uniform Customs, this Letter of Credit shall be governed by and construed in accordance with the laws of the State of New York, including, without limitation, the Uniform Commercial Code as in effect in the State of New York. This Letter of Credit sets forth in full the terms of our undertaking, and such undertaking shall not be modified, annulled or amplified by reference to any other document, instrument or agreement referred to herein or to which the Letter of Credit relates, and such reference shall not be deemed to incorporate herein by reference any document, instrument or agreement, except for the Uniform Customs.

Communications with respect to this Letter of Credit shall be in writing and shall be addressed to us at [ADDRESS], specifically referring to the number of this Letter of Credit.

Authorized Signature

Authorized Signature

SCHEDULE I (FORM OF L/C DEMAND) TO LETTER OF CREDIT

To: [ISSUING BANK]

Date: [Date]

Dear Sirs,

We refer to your IRREVOCABLE STANDBY LETTER OF CREDIT NUMBER [INSERT LETTER OF CREDIT NUMBER] (the "Letter of Credit"). Terms used in herein have the meaning as defined in the Letter of Credit. This is a Demand under the Letter of Credit.

1. Pursuant to the Letter of Credit, demand is hereby made for payment of the sum of [INSERT IN WORDS] ([INSERT IN NUMBERS]).

2. Payment should be made to the following account:

[INSERT ACCOUNT INFORMATION]

3. The date of this Demand is not later than the expiration date of the Letter of Credit.

Yours faithfully,

[]

(Authorized Signatory)

For

[BENEFICIARY]

SCHEDULE II (FORM OF REDUCTION NOTICE) TO LETTER OF CREDIT

To: [ISSUING BANK]

Date: [Date]

Dear Sirs,

We refer to your IRREVOCABLE STANDBY LETTER OF CREDIT NUMBER [INSERT LETTER OF CREDIT NUMBER] (the "Letter of Credit"). Terms used in herein have the meaning as defined in the Letter of Credit. This is a Reduction Notice under the Letter of Credit.

With effect from the date of this Reduction Notice, the L/C Amount is reduced by [INSERT WORDS] ([INSERT NUMBERS]).

Yours faithfully,

[]

(Authorized Signatory)

For

[BENEFICIARY]

[]

(Authorized Signatory)

For

[APPLICANT]

Exhibit D

Required Amount

<u>Contract Year</u>	<u>Required Amount</u>
Any Contract Year ending on or before May 31, 2019	\$22,500,000
Any Contract Year commencing on or after June 1, 2019 and ending on or before May 31, 2024	\$18,750,000
Any Contract Year commencing on or after June 1, 2024 and ending on or before May 31, 2029	\$15,000,000
Any Contract Year commencing on or after June 1, 2029	\$11,250,000

EXHIBIT 1

Legal Description of Project Site

PROJECT SITE DESCRIPTION

(Morrison Survey is verifying total acres. District is fine with leasing maximum available acres. The east property line of area leased to BG and DII needs to be determined, verified and checked. This may be causing the difference between 90 acres and over 100 acres.)

EXHIBIT 2

Form of [Option Notice] or [Exercise of Right to Extend Option]

[Date]

Lake Charles Harbor & Terminal District
751 Bayou Pines East, Suite P
Lake Charles, LA 70601
Attention: President

Re: [Exercise of Option] [Extension of Option]

Dear Ladies and Gentlemen:

Reference is made to that certain Real Estate Lease Option Agreement dated as of _____, 2013 (the "Option Agreement") by and between Magnolia LNG, LLC, a Delaware limited liability company ("PROJECT COMPANY"), and the Lake Charles Harbor & Terminal District, a political subdivision of the State of Louisiana, (the "DISTRICT"). All capitalized terms used in this letter shall have the meanings ascribed thereto in the Option Agreement.

This letter shall serve as written notice by PROJECT COMPANY to the DISTRICT under the Option Agreement of PROJECT COMPANY's intention to [exercise its Option under the Option Agreement to enter into the Ground Lease for the Project Site] [extend the Option Agreement for the _____ Extended Option Period].

No further action is required by the DISTRICT in order for PROJECT COMPANY's [exercise of its Option] [extend the Option Agreement for the _____ Extended Option Period] to be effective and upon delivery of this letter to the DISTRICT, PROJECT COMPANY shall be deemed to have [exercised its Option under the Option Agreement] [extended the Option Agreement for the _____ Extended Option Period].

Very truly yours,
Magnolia LNG, LLC

By: _____
Its duly authorized signatory

cc: Executive Director
Lake Charles Harbor & Terminal District
751 Bayou Pines East, Suite P
Lake Charles, LA 70601

Michael K. Dees
Lake Charles Harbor & Terminal District
751 Bayou Pines East, Suite P
Lake Charles, LA 70601

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Appendix 1.C.2

BG LNG Option Agreement

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REAL ESTATE LEASE OPTION AGREEMENT

BE IT KNOWN, that on the dates hereinafter set forth, before the undersigned Notaries Public, duly commissioned and qualified in and for their respective State and County/Parish, and in the presence of the undersigned competent witnesses personally came and appeared:

MAGNOLIA LNG, LLC ("MAGNOLIA"), a Delaware limited liability company with its principal business office located at 5 Ord Street, West Perth, Western Australia 6005, and with its registered office in Louisiana at 5615 Corporate Blvd, Suite 400B, Baton Rouge, LA 70808, herein represented by its duly authorized undersigned representative; and

BG LNG SERVICES, LLC ("BG"), a Delaware limited liability company, herein represented by its duly authorized representative, with its principal business office located in Harris County, Texas, 811 Main Street, Suite 3400, Houston, Texas 77002

which hereinafter collectively declare that:

WITNESSETH:

WHEREAS, the Lake Charles Harbor & Terminal District ("District") is a deep water port and political subdivision of the State of Louisiana ("State") exercising governmental powers of the State as delegated and authorized pursuant to the Louisiana Constitution and other statutory supplemental authorities, acting by and through the Executive Director of the District, having its office and domicile at 751 Bayou Pines East, Suite P, Lake Charles, Louisiana;

WHEREAS, pursuant to (i) that certain Ground Lease Agreement dated as of September 1, 1998, by and between PIM, L.L.C. (predecessor-in-interest to Trunkline LNG Company, LLC, a Delaware limited liability company ("Trunkline")) and District, recorded at Conveyance Book 2720, page 479, file number 2426040, official records of Calcasieu Parish, Louisiana, (together with all of its material assignments of and amendments and extensions, "1998 PIM Lease") and (ii) that certain Ground Lease Agreement dated as of January 25, 2005 by and between Trunkline and District, a memorandum of which is recorded at Conveyance Book 3562, page 240, file

number 2909147, official records of Calcasieu Parish, Louisiana (together with any of its material amendments and extensions, "2005 Trunkline Lease") (the 1998 PIM Lease and the 2005 Trunkline Lease shall together or collectively be referred to as the "Trunkline Lease Agreements"), Trunkline leased land owned by District for the use and occupancy of District for the purposes stated in the Trunkline Lease Agreements including the construction, maintenance, and operation of docks, wharves, and bulkheads, the layberthing of liquefied natural gas ocean-going motor vessels, together with other support vessels and associated vessel support operations, and the handling and movement of cargoes, and related activity;

WHEREAS, pursuant to Ground Sublease Agreement dated May 30, 2006 (the "BG Ground Sublease") by and between Trunkline and BG, Trunkline subleased Tracts 1 and 2 (containing 31.73 acres) included in the 2005 Trunkline Lease and Parcels I and II and Tract 2 (containing 40.38 acres) included in the 1998 PIM Lease to BG;

WHEREAS, Trunkline and District entered into an Amended and Restated Composite Lease (Turning Basin Properties) dated effective May 30, 2006, recorded at Conveyance Book 3905, page 229, file number 3114189, aforesaid records, which amended and restated in their entirety the 1998 PIM Lease as amended and assigned and the 2005 Trunkline Lease as amended and assigned (the "Restated Trunkline Lease");

WHEREAS, BG and Trunkline entered into a Restated and Amended Sublease (Turning Basin Properties) dated effective June 9, 2010, recorded at Conveyance Book 3905, page 196, file number 3114188, aforesaid records (the "BG Restated Sublease") which amended and restated the BG Ground Sublease in its entirety;

WHEREAS, MAGNOLIA has determined that a portion of BG subleased land under the BG Restated Sublease is needed for and essential to the construction, operation and maintenance of a liquefied natural gas processing and export facility (the "Facility") to be constructed and operated by MAGNOLIA; such portion of BG subleased lands (the "Magnolia Site") being described on Exhibit 1 attached hereto and comprising of approximately 7.73 acres more or less;

WHEREAS, in an effort to accommodate the District's objective of promoting the economic development and creation of jobs in the greater Lake Charles area while expressly

reserving all of BG’s rights to monitor, comment and object to the Project (as defined below) during the regulatory and permitting process, BG has agreed to enter into this Real Estate Lease Option Agreement (this “Option Agreement”) to give MAGNOLIA the opportunity to assess the Magnolia Site for purposes of locating, constructing, operating and maintaining the Facility or portions thereof, and any other facilities related to the operations of MAGNOLIA as described above (collectively, the “Project”); and

WHEREAS, the District and Trunkline consent to this Real Estate Lease Option Agreement (the “Option Agreement”) and the sublease transaction contemplated hereby, pursuant to their intervention below.

NOW, THEREFORE, in consideration of the above recitals and the mutual covenants hereinafter contained, the parties herein covenant and agree as follows:

AGREEMENT

1. **PARTIES**. This Option Agreement is between BG and MAGNOLIA on the terms and conditions hereinafter set forth, to-wit:

2. **IRREVOCABLE AND EXCLUSIVE OPTION TO LEASE**.

A. **Initial Option Period**. For and in consideration of an option payment in the amount of \$6,025.00 (the “Initial Option Payment”) and the mutual covenants hereinafter contained, BG does hereby grant unto MAGNOLIA, or its assignee, an irrevocable and exclusive option (the “Option”) to sublease the Magnolia Site, on the terms and conditions set forth in the attached and annexed Sublease marked as Annex A (the “Magnolia Sublease”). This Option is hereby granted to MAGNOLIA for a period of twelve (12) months from the Effective Date (as defined in Paragraph 21) (the “Initial Option Period”). The Initial Option Payment shall be payable to BG not later than fifteen (15) calendar days after the Effective Date of this Option Agreement.

B. **First Extended Option Period**. The Initial Option Period shall be subject to an extension for up to twelve (12) months (the “First Extended Option Period”) for any reason that MAGNOLIA deems necessary in its sole discretion. The right to extend the Initial Option Period

for the First Extended Option Period may be exercised by MAGNOLIA in its sole discretion in accordance with Paragraph 5 below. If MAGNOLIA exercises its right to extend the Initial Option Period, then MAGNOLIA will make a payment to BG in the amount of \$7,530.00 for the First Extended Option Period (the “First Additional Option Payment”) not later than fifteen (15) calendar days after exercising such right in accordance with Paragraph 5 below.

C. Second Extended Option Period. The First Extended Option Period shall be subject to an extension for up to twelve (12) months (the “Second Extended Option Period”), for any reason that MAGNOLIA deems necessary in its sole discretion. The right to extend the First Extended Option Period for the Second Extended Option Period may be exercised by MAGNOLIA in its sole discretion in accordance with Paragraph 5 below. If MAGNOLIA exercises its right to extend the First Extended Option Period, then MAGNOLIA will make a payment to BG in the amount of \$12,050.00 Dollars for the Second Extended Option Period (the “Second Additional Option Payment”), not later than fifteen (15) calendar days after exercising such right in accordance with Paragraph 5 below.

D. Third Extended Option Period. The Second Extended Option Period shall be subject to an extension for up to twelve (12) months (the “Third Extended Option Period”), for any reason that MAGNOLIA deems necessary in its sole discretion. The right to extend the Second Extended Option Period for the Third Extended Option Period may be exercised by MAGNOLIA in its sole discretion in accordance with Paragraph 5 below. If MAGNOLIA exercises its right to extend the Second Extended Option Period, then MAGNOLIA will make a payment to BG in the amount of \$18,075.00 Dollars for the Third Extended Option Period (the “Third Additional Option Payment”), not later than fifteen (15) calendar days after exercising such right in accordance with Paragraph 5 below. However, if MAGNOLIA properly exercises this Option to Lease the Magnolia Site, then, in that event, BG shall grant a credit to MAGNOLIA of the Initial Option Payment toward any rent due under the Magnolia Sublease.

E. Option Exercise. In order to exercise its Option to sublease the Magnolia Site, MAGNOLIA shall give written notice to BG of its intention to sublease the Magnolia Site in accordance with the provisions of Paragraph 5. If MAGNOLIA fails to timely exercise its Option during the Initial Option Period, the First Extended Option Period, the Second Extended Option

Period, or Third Extended Option Period, as applicable, no further payments shall be due by MAGNOLIA and this Option Agreement shall be terminated and be of no further force or effect. If MAGNOLIA, after meeting all required conditions, timely exercises its Option, during the Initial Option Period or, if applicable, during the First Extended Option Period, the Second Extended Option Period or Third Extended Option Period, the parties shall execute and deliver the Magnolia Sublease on or before the Closing Date (as defined in Paragraph 8.D herein). Except as provided for in Paragraph, 2.D, any Option Payments made by MAGNOLIA under the Option Agreement shall not be deemed or considered rent, rental, or any other consideration under the Magnolia Sublease or used as a credit against any rent or other consideration due under the Magnolia Sublease.

F. Cancellation of Option by MAGNOLIA. Notwithstanding anything to the contrary in this Option Agreement, MAGNOLIA shall have the right at any time during the Initial Option Period or, if applicable, during the First Extended Option Period, the Second Extended Option Period or Third Extended Option Period, to cancel the Option at any time without any additional liability to BG upon delivery of written notice to BG of MAGNOLIA's desire to cancel the Option. Upon such cancellation of the Option by MAGNOLIA at any time, the Initial Option Payment and, if applicable, the First Additional Option Payment, the Second Additional Option Payment and the Third Additional Option Payment (collectively, the "Option Payments"), shall be non-refundable to MAGNOLIA, but no other payments shall be due by MAGNOLIA and this Option Agreement shall be terminated and be of no further force and effect.

3. Intentionally left blank.

4. RENT CREDIT. MAGNOLIA shall not be entitled to any credit for the Option Payments against rent due under the Magnolia Sublease, except as set forth in Paragraph 2D.

5. EXERCISE OF OPTION/EXTENDED OPTION PERIOD. The Option to sublease the Magnolia Site, or the right to extend the Initial Option Period, the First Extended Option Period or the Second Extended Option Period as set forth above, must be exercised in each case, if at all, by delivery of a written notice from MAGNOLIA to BG in substantially the form of Exhibit 2 with the appropriate blanks completed on or before the expiration of the Initial Option

Period or the First Extended Option Period, Second Extended Option Period or Third Extended Option Period, as applicable. Failure to timely exercise the Option or the right to extend the Initial Option Period, First Extended Option Period or Second Extended Option Period shall automatically terminate the right of MAGNOLIA to exercise the Option or to extend the Initial Option Period or First Extended Option Period, as applicable.

6. CONSIDERATION FOR THE LEASE OF MAGNOLIA SITE. If MAGNOLIA meets all required conditions and timely exercises its Option to sublease the Magnolia Site, BG shall comply with all terms and conditions of this Option Agreement as hereinafter set forth to sublease the Magnolia Site to MAGNOLIA on the Closing Date for the consideration as stated in the Magnolia Sublease and in accordance with the provisions of this Option Agreement and the Magnolia Sublease.

7. MAGNOLIA'S RIGHTS AND BG'S OBLIGATIONS DURING THE OPTION PERIOD.

A. Access and Inspection; Early Works. At all times during this Option Agreement, MAGNOLIA shall, at its cost, and upon providing at least twenty-four hours prior notice to BG (which may be telephonic notice), have reasonable access to the Magnolia Site for the purpose of determining the suitability of the Magnolia Site and performing any and all other inspections, analyses, tests and other due diligence that MAGNOLIA deems necessary or desirable in its sole discretion, including, without limitation, (i) developing preliminary engineering, design and construction information relative to the facilities required to comprise and support the Project, (ii) performing site assessments of the Magnolia Site by a contractor or contractors, including, without limitation, Phase I and Phase II environmental site assessments and any other environmental assessments that MAGNOLIA or any governmental entity regulating the Project deems necessary, (iii) performing engineering design, geotechnical, geophysical, seismic, archaeological and land surveys and assessments of and around the Magnolia Site, (iv) performing tests and inspections of improvements, structures, wells, septic tanks, underground storage tanks, soils, geologic hazards, utility lines and systems located on or under, the Magnolia Site, (v) conducting soil borings upon the Magnolia Site, for purposes of analyzing such soils, (vi) interviewing persons familiar with the Magnolia Site, (vii) coordinating design activities

with District; (viii) performing a land survey and title review, and (ix) any other actions or activities deemed by MAGNOLIA in its sole discretion to be necessary or desirable for MAGNOLIA to inspect, assess and establish the suitability of the Magnolia Site or assess compliance with this Option Agreement (collectively, the “Magnolia Site Activities”). Further, MAGNOLIA may have additional rights to undertake certain activities on the Magnolia Site subject and in accordance with an “Early Works Agreement” which may be negotiated and agreed upon in the future between MAGNOLIA and BG. MAGNOLIA and its employees, agents, representatives, contractors and consultants shall have access to the Magnolia Site, upon providing at least twenty-four (24) hours notice to BG (which may be telephonic notice), during the Initial Option Period and the First Extended Option Period, the Second Extended Option Period or Third Extended Option Period, as applicable, unless and until the date on which MAGNOLIA shall have entered into the Magnolia Sublease, or the expiration or termination of this Option Agreement. After the full execution of the Magnolia Sublease, MAGNOLIA shall have access to the Magnolia Site pursuant to the terms of the Magnolia Sublease.

B. Compliance with Laws; No Environmental Liability. MAGNOLIA shall take reasonable measures to ensure that its employees, agents, representatives, contractors and consultants, in conducting any Magnolia Site Activities, comply with all applicable laws, rules, regulations, ordinances and decrees of any governmental body, and the reasonable health and safety procedures currently in effect and otherwise implemented by BG from time to time for all the BG subleased lands. BG acknowledges and agrees that MAGNOLIA shall not incur any liability for any hazardous materials and/or substances, including, but not limited to, natural occurring radioactive material (“NORM”), asbestos, and polychlorinated biphenyls (“PCB”), existing on the Magnolia Site, as of the Commencement Date (as defined in the Magnolia Sublease) and shall not incur any liability for discovery of such hazardous materials and/or substances.

C. Delivery of Copies of Reports by MAGNOLIA. Excluding any materials owned by third parties, proprietary information of MAGNOLIA, materials subject to obligations of confidentiality or other restrictions or materials that cannot easily be separated from materials pertaining to property other than the Magnolia Site, all reports, plans, maps, surveys, soil studies, soil reports, or such other similar information pertaining solely to the physical condition of the

Magnolia Site developed by MAGNOLIA or its employees, agents, representatives, contractors and/or consultants pursuant to the Magnolia Site Activities prior to the Closing Date or, if the Option is not exercised, prior to the expiration of this Option Agreement (“Data”) shall be provided to BG at no cost within thirty (30) calendar days following the Closing Date or, if the Option is not exercised, within thirty (30) calendar days following the expiration of this Option Agreement. BG acknowledges and agrees that MAGNOLIA owns all such Data, subject to BG’s right to utilize such Data for any purpose without further consents or approval of MAGNOLIA.

D. Delivery of Diligence Materials by BG. No later than thirty (30) calendar days after the Effective Date, BG shall provide to MAGNOLIA, at BG’s expense and to the extent that BG currently has possession of same: (i) copies of any and all title insurance policies, title abstracts, title commitments, title exception documents and vesting deeds solely for the Magnolia Site; (ii) copies of any surveys, environmental assessments, audits, test results or reports, wetland mitigation documentation, engineering studies or surveys and soil conditions reports or studies, within BG’s possession or access or that of its attorneys, consultants, contractors and/or engineers solely related to the Magnolia Site; (iii) copies of any and all Governmental Approvals (as defined in Paragraph 7.E herein) that apply to or that BG has obtained solely for the Magnolia Site; (iv) copies of all contracts, leases, agreements, security agreements, servitudes, liens and obligations currently in effect relating to the Magnolia Site; (v) copies of any documents relating to pending litigation, written threats of litigation, legal violations, zoning changes or development moratoriums, and (vi) copies of any other information BG may have in its possession or control regarding the Magnolia Site (collectively, “Magnolia Site Materials”). The parties acknowledge and agree that BG’s obligation to provide the Magnolia Site Materials is on-going during this Option Agreement, to the extent that any such information becomes available to or is created by or for BG following the Effective Date.

E. Governmental Approvals. The execution and delivery of this Option Agreement and, if applicable, the Magnolia Sublease, shall not affect or diminish any rights that BG has or may have to monitor, comment and/or object to the Project during the Governmental Approvals (as defined hereinafter) process or at any other time during the term of this Option Agreement or the Magnolia Sublease, which reserved rights also include Trunkline’s right to monitor, comment and/or object for purposes of this Section 7E (collectively, the “BG Reserved Rights”); provided,

however that neither BG nor Trunkline shall derive any rights whatsoever with respect to Governmental Approvals for the Facility by reason of this Option Agreement or the Magnolia Sublease. BG shall assist MAGNOLIA, at no additional costs or expense to BG, with such matters as reasonably requested by MAGNOLIA in writing in connection with MAGNOLIA's efforts to complete and obtain: (i) all regulatory permits and approvals (including, without limitation, the issuance of any FERC permits, special use permits, building permits, zoning matters, environmental permits, and any other permits, approvals or ordinances deemed necessary or desirable by MAGNOLIA in its reasonable discretion in order to construct, develop and operate the Project on the Magnolia Site ("Governmental Approvals"), and (ii) results from the Magnolia Site Activities. MAGNOLIA agrees to diligently pursue obtaining all Governmental Approvals and satisfying all requirements in connection therewith. Subject at all times to the BG Reserved Rights, BG agrees that MAGNOLIA shall have the authority to apply for all Governmental Approvals. No Governmental Approvals shall be binding on BG or create any obligations to be fulfilled by BG unless BG specifically consents to be bound by such obligations in writing. MAGNOLIA further acknowledges and agrees that any reasonable exercise of the BG Reserved Rights at any time shall not constitute a default or other breach under this Option Agreement or the Magnolia Sublease (including, but not limited to Section 20.1 thereof), nor shall the reasonable exercise of any BG Reserved Rights at any time be grounds for MAGNOLIA to seek return of any portion of the Option Payments or other payments/expenses incurred or due by MAGNOLIA hereunder or pursuant to the Magnolia Sublease.

F. Operation of Magnolia Site During Option Period. After the Effective Date, BG and its employees, contractors and agents (i) shall maintain the Magnolia Site in the same condition as it was on the Effective Date, reasonable wear and tear excepted, and otherwise operate and maintain the Magnolia Site in the same manner as before the Effective Date, (ii) except in the case of an emergency, or to avert a potential emergency, shall not take any action and shall not permit any third party to take any action that would unreasonably interfere with MAGNOLIA'S lawful Magnolia Site Activities, (iii) shall not take any action and shall not cause any third party to take any action that would materially alter or affect the condition of the Magnolia Site, including, but not limited to, by causing a casualty or introducing, releasing, storing or exacerbating any hazardous waste or hazardous substances, including, but not limited

to, NORM, asbestos, and PCBs, upon, around or under any portion of the Magnolia Site or into the ground water beneath or adjacent to the Magnolia Site , and (iv) shall comply with any notices of legal violations or court orders affecting the Magnolia Site. If BG becomes aware prior to the Closing Date of any introduction, release, storage or exacerbation of any hazardous waste or hazardous substances, including, but not limited to, NORM, asbestos, and PCBs, upon, around or under any portion of the Magnolia Site or into the ground water beneath or adjacent to the Magnolia Site, then BG shall notify MAGNOLIA in writing the earlier of (a) within fifteen (15) calendar days after BG becomes aware of the same or (b) prior to the Closing Date. If BG violates this Paragraph 7.F, then BG shall take all reasonable actions to cure or remedy such violation at its sole cost and expense. If BG is unable to cure or remedy such violation by the Closing Date, then MAGNOLIA shall have the option in its sole discretion (to be exercised in a written notice delivered to BG) to: (a) grant BG additional time within which to cure the violation, and in such event the Closing (as defined in Paragraph 8.D herein) shall be extended for such time necessary to cure the violation (in which case MAGNOLIA and BG shall continue to have all of the rights and obligations set forth in this Option Agreement until the Closing); (b) elect not to enter into the Magnolia Sublease, whereupon BG shall immediately refund the aggregate Option Payments paid to BG and BG shall be liable to MAGNOLIA for MAGNOLIA's actual third party costs and expenses incurred in the due diligence and/or development of the Magnolia Site, drafting and negotiating of this Option Agreement and the Magnolia Sublease, and preparation of the Closing of the transaction contemplated by this Option Agreement (including, without limitation, all costs and expenses incurred in connection with the Magnolia Site Activities); or (c) waive such violation and proceed to Closing as provided in Paragraph 8.D below.

8. ADDITIONAL RIGHTS AND OBLIGATIONS PENDING EXERCISE OF LEASE OPTION. During the Initial Option Period, First Extended Option Period, Second Extended Option Period and Third Extended Option Period, as applicable, BG and MAGNOLIA hereby agree as follows:

A. Verification of Title and Survey.

(i) MAGNOLIA, at MAGNOLIA's expense, may obtain a title insurance commitment ("Title Commitment") to be issued by a title insurance company acceptable to MAGNOLIA in its sole discretion ("Title Company"), pursuant to which the Title Company shall commit to issue a 2006 ALTA extended coverage leasehold title insurance policy to MAGNOLIA ("Leasehold Title Policy") and a 2006 ALTA leasehold title loan insurance policy to any lender(s) of MAGNOLIA ("Lender Title Policy", and collectively with the Leasehold Title Policy, the "Title Policies"), each in forms and insurable amounts reasonably acceptable to MAGNOLIA and with such endorsements as MAGNOLIA may reasonably request. The Title Commitment shall show BG to be vested with good, marketable and complete leasehold interest pursuant to the BG Restated Sublease, subject to Trunkline's and the District's rights under the BG Restated Sublease and Restated Trunkline Lease, respectively, concerning the Magnolia Site and further subject only to the following matters (the "Permitted Exceptions"): ad valorem real estate taxes, if any are owed, for the current year and subsequent years, not yet due and payable; all applicable zoning ordinances and regulations; and such other matters as shall be satisfactory to MAGNOLIA, in MAGNOLIA's sole discretion.

(ii) MAGNOLIA may obtain, at MAGNOLIA's expense, a current staked ALTA/ACSM survey of the Magnolia Site, complying with the most current Minimum Standard Detail Requirements for ALTA/ACSM Surveys and including any Table A items that MAGNOLIA may request in its sole discretion ("Survey"), prepared by a surveyor or engineer licensed in Louisiana with a certificate attached thereto executed by the surveyor in the form of the most current Minimum Standard Detail Requirements certificate for ALTA/ACSM surveys. The Survey shall reflect the boundaries of the Magnolia Site and all improvements, servitudes, highways, pipeline, utility and other rights-of-way, flood zone classifications and other matters affecting or abutting the Magnolia Site, and shall be in a form sufficient to induce the Title Company to delete all standard and printed exceptions contained in the Title Commitment with regard to survey matters.

(iii) MAGNOLIA shall have until sixty (60) calendar days prior to Closing (the "Title Review Period") to notify BG of any title defects, encumbrances, servitudes, use

restrictions or other matters noted in the Title Commitment, the Survey, or elsewhere that MAGNOLIA requires to be removed or corrected prior to the execution and issuance of the Magnolia Sublease (“Title Objections”).

(iv) The Title Commitment will show that all standard exceptions will be deleted from the Leasehold Title Policy (and from the Lender Title Policy, if MAGNOLIA has requested one), when issued, and that the “gap” will be deleted as of the Closing Date. If, within the Title Review Period, MAGNOLIA notifies BG of any Title Objections, BG shall use its diligent, good faith, commercially reasonable efforts to cure (or cause the District and Trunkline to cure) and eliminate the Title Objections (unless caused directly or indirectly by MAGNOLIA) at the District’s expense (unless same are caused directly by BG or Trunkline in which case the costs shall be borne by BG or Trunkline as applicable). MAGNOLIA shall have the right to make additional requirements or objections as to title, up until the Closing Date, in the event any title or survey update or endorsement to the Title Commitment discloses matters not shown in the Title Commitment or Survey (“Additional Title Objections” and together with the initial Title Objections, the “Title Objections”). As long as this Option Agreement remains in effect, BG shall not convey all or any interest in the Magnolia Site to any third party (an “Unauthorized Transfer”) and, without MAGNOLIA’s prior written consent in its sole discretion, BG shall not grant or amend any lease, license, permit to use, servitude, lien, security interest or other encumbrance on the Magnolia Site (an “Unauthorized Encumbrance”). If BG is unable to cure the Title Objections, Unauthorized Transfer or Unauthorized Encumbrance by the Closing Date, MAGNOLIA shall have the option in its sole discretion (to be exercised in a written notice delivered to BG) to: (a) grant BG additional time within which to cure (or cause the cure of) the Title Objections, Unauthorized Transfer or Unauthorized Encumbrance, and in such event the Closing shall be extended for such time necessary to cure the Title Objections, Unauthorized Transfer or Unauthorized Encumbrance (in which case MAGNOLIA and BG shall continue to have all of the rights and obligations set forth in this Option Agreement until the Closing); (b) elect not to enter into the Magnolia Sublease, whereupon BG shall immediately refund the aggregate Option Payments paid to BG and the parties will be relieved from further liability hereunder, unless BG defaulted in its obligations under this Option Agreement (including, but not limited to, causing and failing to cure an Unauthorized Transfer or Unauthorized Encumbrance if BG is the sole cause of same) or acted in a commercially unreasonable manner

in not causing the District to cure such Title Objections or those Title Objections arising directly from BG's acts, in which event BG shall be liable to MAGNOLIA for MAGNOLIA's actual third party costs and expenses incurred in the due diligence and/or development of the Magnolia Site; drafting and negotiating of this Option Agreement and preparation of the Closing of the transaction contemplated by this Option Agreement (including, without limitation, all costs and expenses incurred in connection with the Magnolia Site Activities); or (c) waive one or more of the Title Objections, Unauthorized Transfers or Unauthorized Encumbrances (at which point such Title Objections, Unauthorized Transfer or Unauthorized Encumbrances will become Permitted Exceptions) and proceed to the Closing, as provided in Paragraph 8.D below.

(v) For purposes of clarification, if the Survey reflects encroachments, non-contiguity, overlaps, strips, gaps, rights-of-way or other encumbrances or interests on or in the Magnolia Site, or any other survey matters, or if the Magnolia Site, consists of two or more parcels which are not contiguous along the entire length of their common boundary, such defects may also be raised as a Title Objection as described in Paragraph 8.A (iv) above.

B. BG's Representations. BG warrants, covenants and represents, during the term of this Option Agreement, the following to MAGNOLIA with full knowledge that MAGNOLIA is relying upon same in agreeing to enter into this Option Agreement:

(i) BG subleases the Magnolia Site. BG has the full power and authority to make, deliver, enter into and perform pursuant to the terms and conditions of this Option Agreement and to consummate the transactions described in this Option Agreement and the Magnolia Sublease, and has taken all necessary action and proceedings to authorize the execution, delivery and performance of the terms and conditions of this Option Agreement and the Magnolia Sublease. No further consent of any person or entity is required in connection with the execution and delivery of, or performance by BG of its obligations under this Option Agreement and the Magnolia Sublease, except for the consent of the District and Trunkline which consent is given in the Intervention section of this Option Agreement.

(ii) This Option Agreement and the documents to be executed and delivered by BG in connection with the consummation of this Option Agreement are (and when the Option

is exercised and the Closing has occurred, the Magnolia Sublease will be) valid, binding and enforceable in accordance with their respective terms and conditions.

(iii) The execution, delivery and performance by BG of this Option Agreement and the Magnolia Sublease are not precluded by, and will not violate, any provisions of any existing law, statute, rule or regulation in Louisiana or any judgment, order, decree, writ or injunction of any court, governmental department, commission, board, bureau or agency, and will not result in a breach of, or default under, any agreement, mortgage, contract, undertaking or other instrument or document to which BG is a party or by which BG is bound or to which BG or any portion of the Magnolia Site is subject.

(iv) No portion of the Magnolia Site is presently being or, as of the Effective Date, previously has been acquired by any governmental authority in the exercise of its power to condemn or to acquire through eminent domain or private purchase in lieu thereof nor are any of these proceedings or actions threatened, pending or imminent.

(v) There are no actions, suits or proceedings pending or to BG's Knowledge (as defined in Paragraph 8.B(xii)), threatened against, by or affecting BG in any court or before any government agency regarding the Magnolia Site, including, but not limited to, any such actions, suits or proceedings relating to the ownership of, or BG's ability to sublease the Magnolia Site or that would affect the value or use or development of the Magnolia Site or the obligations of BG to enter into and perform its obligations under this Option Agreement or the Magnolia Sublease.

(vi) All work, labor, service and materials furnished prior to the Closing Date solely to or solely in connection with the Magnolia Site and any improvements constructed on the Magnolia Site prior to the Closing Date, will be discharged by BG prior to the Closing Date, so that no mechanics', materialmen's or other lien, except those created by MAGNOLIA, its affiliates or contractors, may be filed against the Magnolia Site or such improvements. BG shall indemnify, defend and hold MAGNOLIA harmless from and against any liens affecting the Magnolia Site solely created by BG and (a) relate to work, labor, services, or materials furnished prior to the Closing Date and (b) are not filed or perfected until after the Closing Date.

(vii) To BG's Knowledge there are no parties other than BG in possession of any portion of the Magnolia Site, as lessees, tenants at sufferance, licensees, or trespassers, and no person or entity has any right or option to lease, purchase, occupy or possess all or any part of the Magnolia Site, except for the District and Trunkline in accordance with the BG Restated Sublease and Restated Trunkline Lease and the District's condemnation authority or general police power.

(viii) BG has not entered into any agreement, commitments or arrangements concerning the Magnolia Site, or development thereof with any persons, including, but not limited to, governmental entities or agencies, councils, boards or other entities, adjoining landowners, utility companies or agencies other than MAGNOLIA.

(ix) The Magnolia Site is not subject to assessment or collection of additional taxes for prior years based upon a change of land usage or ownership.

(x) To BG's Knowledge, BG has not manufactured, stored, released or located any hazardous waste or hazardous substances, including, but not limited to, NORM, asbestos, and PCBs, upon, around or under any portion of the Magnolia Site or into any ground water beneath or adjacent to the Magnolia Site and BG has received no warning notice, violation notice, complaint (judicial or administrative) or any other formal or informal notice alleging that the Magnolia Site is not in compliance with any statute, ordinance, rule or regulation pertaining to hazardous waste or substances, including, but not limited to, NORM, asbestos, and PCBs. Except as disclosed by any reports provided to MAGNOLIA pursuant to Paragraph 7.D of this Option Agreement, to BG's Knowledge (a) no hazardous waste or hazardous substances, including, but not limited to, NORM, asbestos, or PCBs, have been manufactured, stored, released or located upon or under any portion of the Magnolia Site or into any ground water beneath or adjacent to the Magnolia Site, (b) the Magnolia Site has never been used to treat, store, release or dispose of waste materials or hazardous substances, including, but not limited to, NORM, asbestos, or PCBs; (c) there has not been and is no leaching or drainage of waste materials or hazardous substances, including, but not limited to, NORM, asbestos, or PCBs, into the ground water beneath or adjacent to the Magnolia Site; and (d) there have not been and are

not buried or semi-buried or otherwise placed tanks, storage vessels, drums or containers of any kind located on the Magnolia Site.

(xi) BG has received no notice from any governmental authority concerning the imposition or widening of any streets, roads or highways abutting the Magnolia Site or widening of the shipping channel alongside the Magnolia Site, or concerning the imposition of any special taxes or assessments against the Magnolia Site. BG has no knowledge of general plan, specific plan, zoning or other land use regulation proceedings or special assessment proceedings pending or threatened, with respect to the Magnolia Site. BG is not a party to any covenant or agreement to preserve or prevent a change in the existing zoning, land use designations, special use permits or entitlements of the Magnolia Site.

(xii) Other than as set forth in this Option Agreement, BG has not (a) entered into any agreement relating to the Magnolia Site, nor (b) encumbered or granted any interest in the Magnolia Site.

Each of the foregoing warranties, covenants and representations shall still be true and correct as of the Effective Date (except where specifically noted) and the Closing Date, shall survive the Closing Date and shall not be merged with or into the Magnolia Sublease or any other related instrument of conveyance or transfer. The term "Knowledge" as used in this Paragraph 8.B shall mean what BG knows or should reasonably know about the Magnolia Site, and any other matters addressed by the warranties, covenants, and representations made herein.

C. MAGNOLIA's Representations. MAGNOLIA warrants, covenants and represents, during the term of this Option Agreement, the following to BG, with full knowledge that BG is relying upon same in agreeing to enter into this Option Agreement:

(i) MAGNOLIA has the full power and authority to make, deliver, enter into and perform its obligations pursuant to the terms and conditions of this Option Agreement and has taken all necessary action and proceedings to authorize the execution, delivery and performance of the terms and conditions of this Option Agreement. No further consent of any person or entity is required in connection with the execution and delivery of, or performance by the MAGNOLIA of its obligations under this Option Agreement.

(ii) The execution, delivery and performance by MAGNOLIA of this Option Agreement are not precluded by, and will not violate, any provisions of any existing law, statute, rule or regulation in Louisiana or any judgment, order, decree, writ or injunction of any court, governmental department, commission, board, bureau or agency, and will not result in a breach of, or default under, any agreement, mortgage, contract, undertaking or other instrument or document to which MAGNOLIA is a party or by which MAGNOLIA is bound or to which MAGNOLIA is subject.

(iii) There are no actions, suits or proceedings pending or to MAGNOLIA's Knowledge (as defined in Paragraph 8.C(iv)), threatened against, by or affecting the MAGNOLIA in any court or before any government agency regarding the Magnolia Site, including, but not limited to, any such actions, suits or proceedings relating to the ownership of, or MAGNOLIA's ability to lease the Magnolia Site or that would materially affect the contemplated use or development of the Magnolia Site or the obligations of MAGNOLIA to perform its obligations under this Option Agreement.

(iv) All work, labor, service and materials furnished to MAGNOLIA prior to the Closing Date to or in connection with the Magnolia Site, will be discharged by MAGNOLIA prior to the Closing Date (unless the Option is exercised and the Magnolia Sublease is entered into by the parties in which case such matters will be MAGNOLIA's responsibility pursuant to the terms of the Magnolia Sublease), so that no mechanics', materialmen's or other lien, created by MAGNOLIA, its affiliates or contractors, may be filed against the Magnolia Site or such improvements. MAGNOLIA shall indemnify, defend and hold BG harmless from and against any liens affecting the Magnolia Site that were not created by BG and (a) relate to work, labor, services, or materials furnished prior to the Closing Date at the request or direction of the MAGNOLIA and (b) are not filed or perfected until after the Closing Date.

(v) MAGNOLIA, in conducting the activities permitted under this Option Agreement and the Magnolia Sublease and MAGNOLIA's other business operations, shall take such reasonable steps as are necessary not to interfere with or otherwise disrupt (a) BG's use of other property which BG leases from the District or Trunkline; (b) BG's business and operations

on or near the Magnolia Site or the Calcasieu Ship Channel; or (c) BG's sublessee's of property adjacent or in the vicinity of the Magnolia Site.

Each of the foregoing warranties, covenants and representations shall still be true and correct as of the Effective Date (except where specifically noted) and the Closing Date, shall survive the Closing Date and shall not be merged with or into the Magnolia Sublease or any other related instrument of conveyance or transfer. The term "Knowledge" as used in this Paragraph 8.0 shall mean what MAGNOLIA knows or should reasonably know about the matters addressed by the warranties, covenants and representations made herein.

D. Closing. The execution of the Magnolia Sublease (the "Closing") shall take place as soon as practical following the MAGNOLIA's exercise of the Option as provided in Paragraph 5 above, but in no event shall the Closing take place later than fifteen (15) calendar days following such exercise, as may be extended by the extensions provided for in Paragraphs 7.F, 8.A and 8.G ("Closing Date"). Possession of the Magnolia Site shall be delivered to MAGNOLIA or its assignee as of the Closing Date, free and clear of the rights and claims of any other party other than Permitted Exceptions; provided, however, that prior to the Closing Date, MAGNOLIA and its employees, agents, representatives, contractors and consultants shall have the right to enter upon the Magnolia Site at any and all times for purposes of any further inspections of the Magnolia Site as provided in Paragraph 7 above, upon providing at least twenty-four (24) hour prior notice to BG (which may be telephonic notice).

E. Expenses of Closing. At Closing, District shall pay the costs of recording any documents or certificates or taking any other action required to be taken to correct title defects or remove any title encumbrances (including, without limitation, any Title Objections, Additional Title Objections, Unauthorized Transfers or Unauthorized Encumbrances), unless such encumbrances are caused by BG in which case BG shall pay such costs. At Closing, MAGNOLIA shall pay the costs of recording an extract or memorandum of the Magnolia Sublease (as provided in the Magnolia Sublease) and for the Leasehold Title Policy (and the Lender Title Policy, if MAGNOLIA has requested one) issued pursuant to the Title Commitment. MAGNOLIA and BG shall each pay the fees and expenses of their respective counsel incurred in connection with the negotiation, preparation and execution of this Option

Agreement and the Magnolia Sublease, and satisfying its respective obligations under this Option Agreement. MAGNOLIA and BG shall each pay any brokerage, finder's fee or similar commission in connection with the option or lease of the Magnolia Site arising from its actions. MAGNOLIA shall pay the cost of the Survey and the Leasehold Title Policy (and the Lender Title Policy, if MAGNOLIA has requested one).

F. Closing Documents.

(i) BG shall deliver the following at Closing:

(a) Fully executed and signed Magnolia Sublease in substantially the form attached hereto as Annex A.

(b) Gap, mechanic's lien and possession affidavit(s) in forms sufficient to cause the Title Company to issue the Leasehold Title Policy (and the Lender Title Policy, if MAGNOLIA has requested one), without the applicable standard title policy exceptions.

(c) a certified copy of a resolution of the members or managers of BG (as required by the operating agreement of BG), authorizing the execution of the Magnolia Sublease, and all other documents necessary to effect the valid execution of the Magnolia Sublease.

(d) Possession of the Magnolia Site.

(ii) At Closing, MAGNOLIA shall:

(a) Deliver a certified copy of a resolution of the members or managers of MAGNOLIA (as required by the operating agreement of MAGNOLIA), authorizing the execution of the Magnolia Sublease, and all other documents necessary to effect the valid execution of the Magnolia Sublease.

(b) Cause the execution and delivery of the Magnolia Sublease by a duly authorized officer of MAGNOLIA.

G. Conditions Precedent for MAGNOLIA to Close. The following are conditions precedent to MAGNOLIA's obligations at Closing, including execution of the Magnolia Sublease:

(i) As of the Closing Date, all of BG's representations and warranties contained in Paragraph 8.B hereof shall be true and correct.

(ii) BG shall have performed all of its obligations under this Option Agreement.

(iii) BG's interest in the Magnolia Site shall be (and BG hereby warrants and represents to MAGNOLIA that the same is) good, merchantable, marketable and free and clear of any liens, encumbrances, highways, rights-of-way, servitudes, licenses, restrictions, leases, agreements, covenants, conditions and limitations, except the Permitted Exceptions. BG's title shall also be total and complete and not subject to any outstanding or contingent liens or claims of an undivided interest therein and MAGNOLIA shall have received the Survey and an irrevocable written commitment of the Title Company to issue the Leasehold Title Policy (and the Lender Title Policy, if MAGNOLIA has requested one), each in form and substance reasonably acceptable to MAGNOLIA.

(iv) There are no pending, threatened or existing moratoriums or governmental regulations, statutes, proceedings or actions pending, threatened or existing against BG, the Project or the Magnolia Site before any court or governmental agency or authority that would prohibit or inhibit MAGNOLIA from obtaining utility service, building permits or development approvals, or which would prevent, prohibit, delay or inhibit the construction, development and operation of the Project on the Magnolia Site.

(v) Subsequent final geotechnical investigation does not necessitate any substantial revision to the type of structural design contemplated by the preliminary investigation conducted by or on behalf of MAGNOLIA.

(vi) MAGNOLIA shall have obtained Final Approval (as hereinafter defined) with respect to all Governmental Approvals, free of any unreasonable or extraordinary conditions imposed by the issuing entity upon the issuance of such Final Approvals (provided

that MAGNOLIA has used its commercially reasonable efforts to pursue in good faith the necessary Final Approvals). “Final Approval” shall be the date when: (a) all of the Governmental Approvals have been approved and issued, in forms and with conditions satisfactory to MAGNOLIA; (b) the time has passed for appeal of all Governmental Approvals; and (c) any appeals or litigation with respect to clause (b) above have been prosecuted and fully and finally resolved in a manner satisfactory to MAGNOLIA. If MAGNOLIA exercises the Option but fails to execute the Magnolia Sublease through no fault of BG, in addition to forfeiting the aggregate Option Payments paid, MAGNOLIA shall be liable to BG for BG’s actual third party costs and expenses incurred in preparation of the Closing as contemplated by this Option Agreement.

(vii) There shall have been no material change in the condition of the Magnolia Site from the condition in which the Magnolia Site existed as of the date that MAGNOLIA exercised the Option without MAGNOLIA’s prior written consent.

(viii) BG shall not be in default of any other existing agreement with MAGNOLIA (“Existing Agreements”), after notice and beyond any applicable cure period.

In the event that after MAGNOLIA’s exercise of the Option, any of the conditions precedent to MAGNOLIA’s obligation to sublease the Magnolia Site are not satisfied as of the Closing Date or not waived by MAGNOLIA or it is reasonably determined prior to the Closing Date that such conditions cannot be fulfilled or satisfied and the same are not waived by MAGNOLIA, then, at the sole option of MAGNOLIA (to be exercised in MAGNOLIA’s sole discretion by delivery of written notice to BG): (i) MAGNOLIA may elect not to enter into the Magnolia Sublease and this Option Agreement shall be terminated and all parties shall be relieved of any further obligations hereunder; whereupon BG shall not be obligated to refund any of the Option Payments, except to the extent that the failure to fulfill or satisfy a condition results from BG’s default under this Option Agreement with respect to its obligations described herein, in which case BG shall be obligated to return the aggregate Option Payments paid by MAGNOLIA and shall be liable for MAGNOLIA’s actual third party costs and expenses incurred in the due diligence and/or development of the Magnolia Site, drafting and negotiating of this Option Agreement and the Magnolia Sublease, and preparation of the Closing of the transaction contemplated by this Option Agreement (including, without limitation, all costs and

expenses incurred in connection with the Magnolia Site Activities), or (ii) MAGNOLIA may, at its option and at no cost to MAGNOLIA, extend up to three hundred sixty-five (365) days the Closing or for such period as is reasonably necessary to satisfy all of the conditions precedent to MAGNOLIA's obligation to proceed with the Closing.

H. Conditions Precedent for BG to Close. The following are conditions precedent to BG's obligations at Closing, including execution of the Magnolia Sublease:

(i) As of the Closing Date, all of MAGNOLIA's representations and warranties contained in Paragraph 8.0 hereof shall be true and correct in all material respects.

(ii) MAGNOLIA shall not be in default of any other Existing Agreement with BG, after notice and beyond any applicable cure period.

(iii) MAGNOLIA shall have performed all of its obligations under this Option Agreement.

In the event that after MAGNOLIA's exercise of the Option, any of the conditions to BG's obligation to sublease the Magnolia Site are not satisfied as of the Closing Date or not waived by BG, and the non-fulfillment or satisfaction of such conditions was not caused by BG, in whole or in part, or it is reasonably determined prior to the Closing Date that such conditions cannot be fulfilled or satisfied and the same are not waived by BG, then, at the sole option of BG (to be exercised in BG's sole discretion by delivery of written notice to MAGNOLIA): (i) BG may elect not to enter into the Magnolia Sublease and this Option Agreement shall be terminated and all parties shall be relieved of any further obligations hereunder; whereupon BG shall not be obligated to refund any of the Option Payments. To the extent that the failure of such condition results from MAGNOLIA's default under this Option Agreement with respect to its obligations described herein, or any material obligation under any Existing Agreement with respect to its obligations described therein, MAGNOLIA shall be liable for BG's actual third party costs and expenses in drafting and negotiating of this Option Agreement and the Magnolia Sublease, and preparation of the Closing of the transaction contemplated by this Option Agreement, or (ii) BG may, with MAGNOLIA'S written consent, extend up to three hundred sixty-five (365) days the Closing or for such period as is reasonably necessary to satisfy all of the conditions precedent to

BG's obligation to proceed with Closing, in exchange for which MAGNOLIA shall pay BG Twelve Thousand Forty-Eight Thousand and NO/100 (\$12,048.00) Dollars, prorated for the period of such extension.

I. Mutual Indemnification. MAGNOLIA agrees to indemnify, defend and hold BG and BG's officers and directors harmless from and against any and all claims, actions, damages, liabilities and expenses (including, without limitation, reasonable attorneys' fees and expenses) resulting from any occurrence on the Magnolia Site during the term of this Option Agreement and arising from any act or omission of MAGNOLIA or MAGNOLIA's employees, agents, representatives, contractors or consultants, except to the extent that any of the same arise from or out of the negligence or willful misconduct of BG or BG's employees, agents, representatives, contractors or consultants. BG agrees to indemnify, defend and hold MAGNOLIA and MAGNOLIA's officers, directors, managers, and members harmless from and against any and all claims, actions, damages, liabilities and expenses (including, without limitation, reasonable attorneys' fees and expenses) resulting from any occurrence on the Magnolia Site during the term of this Option Agreement and arising from any act or omission of BG or BG's employees, agents, representatives, contractors or consultants, except to the extent that any of the same arise from or out of the negligence or willful misconduct of MAGNOLIA or MAGNOLIA's employees, agents, representatives, contractors or consultants.

9. Intentionally left blank.

10. SUCCESSORS AND ASSIGNS. This Option Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective successors and lawful assigns. However, this Option Agreement may not be assigned or transferred by MAGNOLIA to any other person or entity without the consent of BG, which consent shall not be unreasonably withheld, delayed or conditioned; provided that if MAGNOLIA is not in default after notice and beyond any applicable cure period under this Option Agreement or any material obligation under an Existing Agreement, MAGNOLIA may assign this Option Agreement in its entirety without BG's prior consent to (i) an Affiliate or (ii) a successor in interest in connection with a merger, acquisition or sale of all or substantially all of MAGNOLIA's assets or membership interests of MAGNOLIA, (iii) as collateral in connection with a financing, or (iv) any person to whom

MAGNOLIA is permitted to assign the Option Agreement. "Affiliate" shall mean an entity that controls, is controlled by or is under common control with MAGNOLIA, where "control" means the ownership directly or indirectly of more than fifty percent (50%) of the voting rights in a company or other legal entity or the ability to directly or indirectly appoint a majority of the directors in a company or other legal entity.

11. NOTICES. All notices required or allowed by this Option Agreement shall be delivered by email (with a requirement that such electronic notice shall be followed within three (3) calendar days by written notice delivered in one of other manners permitted in this paragraph), third party overnight courier (including overnight courier services such as Federal Express) or by certified mail, return receipt requested, postage prepaid, addressed to the party to whom notice is to be given, at the following addresses:

If to MAGNOLIA:

Magnolia LNG, LLC
616 Broad Street
P.O. Box 3759 (70602)
Lake Charles, LA 70601
Attention: Company Secretary
Email: dgardner@lnglimited.com.au

with a copy to:

Winfield E. Little, Jr.
616 Broad Street
P.O. Box 3759 (70602)
Lake Charles, LA 70601
Email: wlittle@littlelawfirm.com

and

Chad Mills
Sutherland Asbill & Brennan LLP
1001 Fannin Street, Suite 3700
Houston, TX 77002-6760
Email: chad.mills@sutherland.com

If to BG:

BG LNG Services, LLC
811 Main Street, Suite 3400
Houston, TX 77002
Attention: Marc Hopkins or Marine Operations
Email: mark.hopkins@bg-group.com
shipping.operations@bg-group.com

Notice shall be deemed to have been given upon receipt by recipient (provided that any notice by email shall have been followed within three (3) calendar days by written notice delivered in one of the other manners permitted under this paragraph), by the overnight courier airbill or by the return receipt. In the event that the recipient fails or refuses to sign the return receipt for delivery by certified mail, the receipt shall be sufficient.

12. DEFAULT. In the event of a default by BG with respect to any of its obligations hereunder, including the satisfaction of all conditions precedent or any breach or misrepresentation by BG of any warranties, representations and covenants made by BG in Paragraph 8.B, MAGNOLIA shall, except as otherwise provided for herein, be entitled to the right of specific performance against BG together with the recovery of all expenses incurred in obtaining specific performance, including reasonable attorney's fees and all costs of court or, at MAGNOLIA's sole election, MAGNOLIA shall be entitled to terminate this Option Agreement and BG shall immediately return all Option Payments previously paid by MAGNOLIA as liquidated damages and shall be liable for MAGNOLIA's actual third party costs and expenses incurred in the due diligence and/or development of the Magnolia Site, drafting and negotiating of this Option Agreement and the Magnolia Sublease, and preparation of the Closing of the transaction contemplated by this Agreement (including, without limitation, all costs and expenses incurred in connection with the Magnolia Site Activities) and MAGNOLIA may exercise any other rights or remedies available at law or in equity. For the avoidance of doubt, this is in addition to any rights for the return of the Option Payments that the MAGNOLIA may have under this Option Agreement. In the event of a default by Magnolia with respect to any of its obligations hereunder, including the satisfaction of all conditions precedent or any breach or misrepresentation by MAGNOLIA of any terms, provisions, warranties, representations and covenants of MAGNOLIA, BG shall, except as otherwise provided for herein, be entitled to the right of specific performance against MAGNOLIA together with the recovery of all expenses incurred in obtaining specific performance, including reasonable attorney's fees and all costs of court or, at BG's sole election, BG shall be liable for BG's actual third party costs and expenses incurred in drafting and negotiating this Option Agreement and the Magnolia Sublease, and preparation of the Closing of the transaction contemplated by this Agreement and BG may exercise any other rights or remedies available at law or in equity. For the avoidance of doubt,

this is in addition to retaining all Option Payments that MAGNOLIA may have paid under this Option Agreement.

13. EMINENT DOMAIN/CASUALTY. If, during the term of this Option Agreement, there is any taking of any portion of the Magnolia Site by eminent domain or condemnation, then BG shall promptly deliver written notice thereto of the MAGNOLIA, and if MAGNOLIA determines that such taking will materially affect the Magnolia Site for the development, construction, maintenance or operation of the Project, in MAGNOLIA's reasonable determination, MAGNOLIA may, at its option (to be exercised in MAGNOLIA's sole discretion by delivery of written notice to BG), terminate this Option Agreement or elect to not enter into the Magnolia Sublease (if MAGNOLIA has already exercised the Option), whereupon BG shall immediately refund the aggregate Option Payments paid to BG and the parties will be relieved from further liability hereunder. In the event that the Magnolia Site is rendered, at any time during the term of this Option Agreement or prior to the Closing, in MAGNOLIA's sole determination, permanently unsuitable for the development, construction, maintenance or operation of the Project as a result of a casualty event (including any hurricane, named storm, flood or tornado) or Force Majeure (as hereinafter defined) event occurring in and around Calcasieu Parish, Louisiana, then MAGNOLIA may, at its option (to be exercised in MAGNOLIA's sole discretion by delivery of written notice to BG), terminate this Option Agreement or elect to not enter into the Magnolia Sublease (if MAGNOLIA has already exercised the Option), whereupon BG shall immediately refund the aggregate Option Payments paid to BG and the parties will be relieved from further liability hereunder.

14. ENTIRE AGREEMENT. This Option Agreement constitutes the entire agreement of the parties with respect to subject matter hereof. All understandings and agreements heretofore between the parties hereto with respect to the subject matter hereof are merged in this Option Agreement which alone fully and completely expresses their understanding.

15. ATTORNEY'S FEES. In connection with any litigation concerning this Option Agreement, the prevailing party shall be entitled to recover all of its costs, expenses and reasonable attorney's fees from the non-prevailing party.

16. **NO WAIVER.** No waiver of any provision of this Option Agreement shall be effective unless it is in writing and signed by the party against whom it is asserted; and any such written waiver shall only be applicable to the specific instance to which it relates and shall not be deemed to be a continuing or future waiver.

17. **AMENDMENTS.** This Option Agreement may not be amended, modified, altered or changed in any respect whatsoever except by further agreement in writing and duly executed by the parties hereto.

18. **GOVERNING LAW.** This Option Agreement shall be governed in its enforcement, construction and interpretation by the laws of the State of Louisiana. In the event that either party must file suit as a result of a default on the part of the other, such suit shall be filed in a state court of competent jurisdiction in the Fourteenth Judicial District Court, State of Louisiana, unless the default of dispute implicates or involves a federal statute, regulation, order, or permit, in which case venue shall be in the federal courts for the Western District of Louisiana.

19. **COUNTERPARTS; HEADINGS; TIME OF THE ESSENCE.** This Option Agreement may be executed in counterparts by the parties hereto and each of which shall be deemed an original but all of which taken together shall constitute but one and the same instrument. The paragraph captions and headings contained in this Option Agreement are included herein for convenience of reference only and shall not be considered a part hereof and are not in any way intended to define, limit or enlarge the terms hereof. Time shall be of the essence for each and every provision of this Option Agreement of which time is an element.

20. **RECORDING.** This Option Agreement shall not be recorded in the public records, provided, however, that BG shall execute, acknowledge and deliver to MAGNOLIA a memorandum of this Option Agreement in recordable form prepared by MAGNOLIA, which may be recorded by MAGNOLIA in the conveyance records of Calcasieu Parish, Louisiana.

21. **EFFECTIVE DATE.** The effective date of this Option Agreement ("Effective Date") shall be the last date that BG or MAGNOLIA executes this Option Agreement.

22. **REAL ESTATE COMMISSION.** BG and MAGNOLIA each represent to the other party that they have dealt with no brokers in connection with the negotiation, execution and/or

delivery of this Option Agreement or the Magnolia Sublease, and no party is entitled to any broker's commission, finder's fee or similar payment with respect to this Option Agreement or the Magnolia Sublease arising from the representing party's actions. If any other person shall assert a claim to a finder's fee, brokerage commission or other compensation on account of alleged employment as finder or broker in connection with this transaction, the party against whom the purported finder or broker is claiming shall indemnify, defend and hold the other party harmless from and against any such claim and any and all costs, expenses and liabilities incurred in connection with such claim or any action or proceeding brought thereon, including, but not limited to, reasonable attorney's fees and court costs in defending such claim.

23. FORCE MAJEURE. Notwithstanding any other provision of this Option Agreement, provided that notice is given within thirty (30) calendar days of an occurrence of an event of Force Majeure (as hereinafter defined) by the party hereto seeking to invoke and utilize the provisions of this Paragraph 23, such party shall be excused from performing any of its respective obligations or undertakings required hereunder for so long as the performance of such obligations are prevented or significantly delayed, retarded or hindered by any event of Force Majeure, provide that an event of Force Majeure shall not excuse any party from making any payment of money required under this Option Agreement. As used in this Paragraph, "Force Majeure" means any cause not reasonably within the control of the party claiming suspension, and shall include, but not be limited to, the following: (i) physical events such as acts of God, landslides, lightning, earthquakes, fires, storms, hurricanes, droughts, floods, washouts, or explosions, (ii) weather related events affecting an entire geographic region; (iii) acts of others such as strikes, lockouts or other industrial disturbances, riots, sabotage, terrorism, insurrections, civil disturbance or wars; provided that the settlement of strikes, lockouts or other industrial disturbances shall be within the sole discretion of the party claiming such suspension; (iv) the failure or interruption of performance by MAGNOLIA's engineering, procurement and construction contractors or any subcontractors of such contractor to the extent caused by an event of Force Majeure; or (v) the failure or interruption of performance by MAGNOLIA's suppliers by reason of such supplier's valid declaration of an event that would constitute an event of force majeure under MAGNOLIA's contract with such supplier; or (vi) governmental actions such as necessity for compliance with any court order, law, statute, ordinance, regulation or policy having the effect of law promulgated by a governmental authority having jurisdiction, or that

restrict MAGNOLIA's ability to construct the Project or any delay in issuance or effectiveness of any Governmental Approval that has been properly applied for by MAGNOLIA that is required to construct the Project.

INTERVENTION BY DISTRICT AND TRUNKLINE

And now into these premises comes LAKE CHARLES HARBOR & TERMINAL DISTRICT ("District") and TRUNKLINE LNG COMPANY, LLC ("Trunkline") which intervene for the purpose of and do hereby consent to the entering into this Option Agreement and the Magnolia Sublease among BG and MAGNOLIA, and which further consent and agree to the following:

A. District and Trunkline consent to this Option Agreement and the Magnolia Sublease and to the Project use proposed for the Magnolia Site. Where approval or consent of District or Trunkline is required by the BG Restated Lease or Restated Trunkline Lease (including, for the avoidance of doubt, for uses beyond the Project use), District and Trunkline agree not to unreasonably withhold, delay or condition such approval or consent.

B. MAGNOLIA agrees that it will not sublease the Magnolia Site without the approval of District, which approval District agrees shall not be unreasonably withheld, delayed or conditioned.

C. District agrees to waive the provision set forth in Section C of the District's Intervention contained in the BG Restated Sublease with respect to the Option Agreement and Magnolia Sublease and any other equivalent provision contained in the documents ancillary to the BG Restated Sublease.

D. District and Trunkline each acknowledge and agree that the Restated Trunkline Lease and BG Restated Lease are or will be in full force and effect on or prior to the exercise of the Option by MAGNOLIA.

E. Upon the occurrence of any event that would give District or Trunkline the right to terminate the BG Restated Lease and/or the Restated Trunkline Lease, or in the event that Trunkline or the District fail to timely exercise any renewal options thereunder, District and/or

Trunkline, as applicable, agree to send written notice to MAGNOLIA describing the circumstances giving rise to such right to terminate and what would need to be done by Trunkline to prevent such termination or that the renewal option(s) have not been timely exercised by BG or Trunkline, whichever the case may be (an "Impending Termination Notice"). If the event giving rise to District's and/or Trunkline's right to terminate concerns Trunkline's or BG's failure to pay any undisputed monies due, MAGNOLIA shall have ten (10) days from receipt of the Impending Termination Notice to prevent termination by making payment on Trunkline's or BG's behalf, whichever the case may be. If the event giving rise to District's or Trunkline's right to terminate is something other than Trunkline's or BG's failure to pay an undisputed amount and MAGNOLIA informs District and/or Trunkline within ten (10) days of receipt of the Impending Termination Notice that it plans to use reasonable efforts to cure or remedy such event, then District and/or Trunkline shall suspend its termination right until sixty (60) days after the date that MAGNOLIA receives the Impending Termination Notice, at which time District and/or Trunkline may exercise its right to terminate if the event giving rise to the Impending Termination Notice has not been cured or remedied. If the event giving rise to District's and/or Trunkline's right to terminate concerns Trunkline's or BG's failure to timely exercise its renewal option under the applicable BG Restated Sublease or Trunkline Restated Lease, the District and/or Trunkline, shall provide the Impending Termination Notice to MAGNOLIA not later than three (3) business days after the date to exercise such renewal option(s) expired and MAGNOLIA shall have thirty (30) days from receipt of such Impending Termination Notice to elect to exercise the applicable renewal option under the applicable lease(s), but only with respect to the Magnolia Site and the District and/or Trunkline shall accept such exercise from MAGNOLIA and enter into such further agreements or documents as MAGNOLIA deems necessary to evidence such exercise of the renewal option with respect to the Magnolia Site.

F. In the event that the BG Restated Lease and/or the Restated Trunkline Lease is rejected, disaffirmed or terminated pursuant to bankruptcy law or other law affecting creditors' rights, then MAGNOLIA shall have the right, exercisable by notice to the District or Trunkline, as the case may be, within thirty (30) days after the effective date of such rejection, disaffirmation or termination, to enter into a new sublease of the Magnolia Site directly with Trunkline or a new direct lease directly with the District, as the case may be. The term of such

new lease or sublease shall begin on the date of the termination of the BG Restated Lease or the Restated Trunkline Lease, as applicable, and shall continue for the remainder of the term thereof (including the right to exercise all extension options thereunder). Such new lease or sublease shall otherwise contain the same terms and conditions as those set forth in the lease or sublease being replaced, except for requirements that are no longer applicable or have already been performed. This provision shall survive any such termination and shall continue in full force and effect thereafter to the same extent as if this provision were a separate and independent contract among MAGNOLIA, Trunkline and the District.

[Signatures on Following Pages]

THUS DONE AND SIGNED by BG LNG SERVICES, LLC at Houston, Texas, in the presence of the undersigned competent witnesses and me, Notary, on this 6th day of SEPT, 2013.

WITNESSES:

BG LNG SERVICES, LLC

Mary C. Ogden
Print Name: Mary C. Ogden

By: Michael R. Mott
Name: MICHAEL R. MOTT
Title: VICE PRESIDENT

Angela Conde
Print Name: Angela Conde

BEFORE ME: BEATRIZ OYANEDEL

Notary Public

My Commission expires: AUG 6, 2017



THUS DONE AND SIGNED by MAGNOLIA LNG, LLC at Houston, Texas, in the presence of the undersigned competent witnesses and me, Notary, on this 28th day of August, 2013.

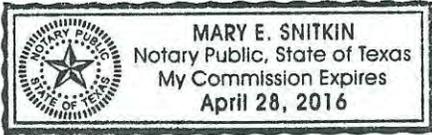
WITNESSES:

MAGNOLIA LNG, LLC

AL LINDER
Print Name: AL LINDER

By: [Signature]
Name: Fletcher Maurice Brand
Title: Managing Director

Gia Vandewer
Print Name: Gia Vandewer



BEFORE ME: _____

Notary Public Mary E Snitkin

My Commission expires: Apr 28, 2016

THUS DONE AND SIGNED by the Lake Charles Harbor & Terminal District as intervenor in the Option Agreement, at Lake Charles, Louisiana in the presence of the undersigned competent witnesses and me, Notary, on this 26th, day of September, 2013.

WITNESSES:

LAKE CHARLES HARBOR &
TERMINAL DISTRICT

Louis Colletta

Print Name: Louis Colletta

By: *William J. Rose III*

Name: William J. Rose III

Title: Executive Director

Donald Brukman

Print Name: Donald Brukman

BEFORE ME: *[Signature]*

Notary Public

My Commission expires: _____



OFFICIAL SEAL

MICHAEL K. DEES
LOUISIANA BAR NO. 04796
NOTARY PUBLIC NO. 2630
STATE OF LOUISIANA
PARISH OF CALCASIEU
MY COMMISSION IS FOR LIFE

THUS DONE AND SIGNED by Trunkline LNG Company, LLC as intervenor in the Option Agreement, at Lake Charles, Louisiana in the presence of the undersigned competent witnesses and me, Notary, on this 11th, day of September, 2013.

WITNESSES:

TRUNKLINE LNG COMPANY, LLC

Stephen M. Moore

Print Name: Stephen M. Moore

By: L.T. Stone

Name: L.T. Stone

Title: Sr. Vice President

Tedd Cooper

Print Name: Tedd Cooper

BEFORE ME: Jessica Miller

Notary Public

My Commission expires: July 12, 2014

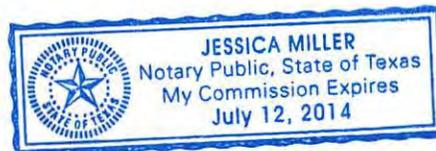


EXHIBIT 1

(Magnolia Site)

Tract 2

THAT CERTAIN TRACT OR PARCEL OF LAND LYING IN THE NORTHWEST QUARTER (NW/4) OF SECTION 16, TOWNSHIP 11 SOUTH RANGE 9 WEST CALCASIEU PARISH, LOUISIANA, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS TO-WIT:

COMMENCING AT THE NORTHEAST CORNER OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, TOWNSHIP 11 SOUTH, RANGE 9 WEST, CALCASIEU PARISH, LOUISIANA;

THENCE SOUTH 00° 36' 59" WEST, ALONG THE EAST LINE OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, FOR A DISTANCE OF 1710.61 FEET;

THENCE NORTH 89° 23' 01" WEST, PERPENDICULAR TO THE EAST LINE OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, FOR A DISTANCE OF 3327.50 FEET, TO A POINT BEING NORTH 00° 21' 53" WEST FROM THE NORTHWEST CORNER OF AN EXISTING WATER FACILITY PLANT, THE SOUTHEAST CORNER AND THE POINT OF BEGINNING OF HEREIN DESCRIBED TRACT;

THENCE NORTH 89° 35' 15" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 141.51 FEET;

THENCE NORTH 76° 41' 29" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 51.15 FEET;

THENCE NORTH 31° 56' 30" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 61.15 FEET;

THENCE NORTH 00° 27' 52" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 224.23 FEET;

THENCE NORTH 00° 05' 52" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 213.55 FEET;

THENCE NORTH 01° 29' 39" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 256.72 FEET;

THENCE NORTH 02° 15' 14" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 100.03 FEET;

THENCE NORTH 82° 51' 44" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 100.00 FEET;

THENCE NORTH 00° 34' 11" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 40.20 FEET;

THENCE NORTH 13° 39' 00" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 102.99 FEET;

THENCE NORTH 22° 49' 51" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 74.59 FEET, TO THE TOP BANK OF THE CALCASIEU RIVER INDUSTRIAL CANAL, THE NORTHWEST CORNER OF THE HEREIN DESCRIBED TRACT;

THENCE MEANDERING ALONG SAID TOP BANK, IN A GENERAL DIRECTION OF SOUTH 81° 59' 48" EAST FOR A DISTANCE OF 99.68 FEET;

THENCE MEANDERING ALONG SAID TOP BANK, IN A GENERAL DIRECTION OF SOUTH 74° 51' 36" EAST FOR A DISTANCE OF 53.10 FEET;

THENCE MEANDERING ALONG SAID TOP BANK, IN A GENERAL DIRECTION OF SOUTH 83° 48' 48" EAST FOR A DISTANCE OF 122.59 FEET;

THENCE SOUTH 00° 21' 53" EAST, FOR A DISTANCE OF 1039.55 FEET TO THE POINT OF BEGINNING.

HEREIN DESCRIBED TRACT CONTAINING 5.74 ACRES, MORE OR LESS.

EXHIBIT 1-A

(Magnolia Site)

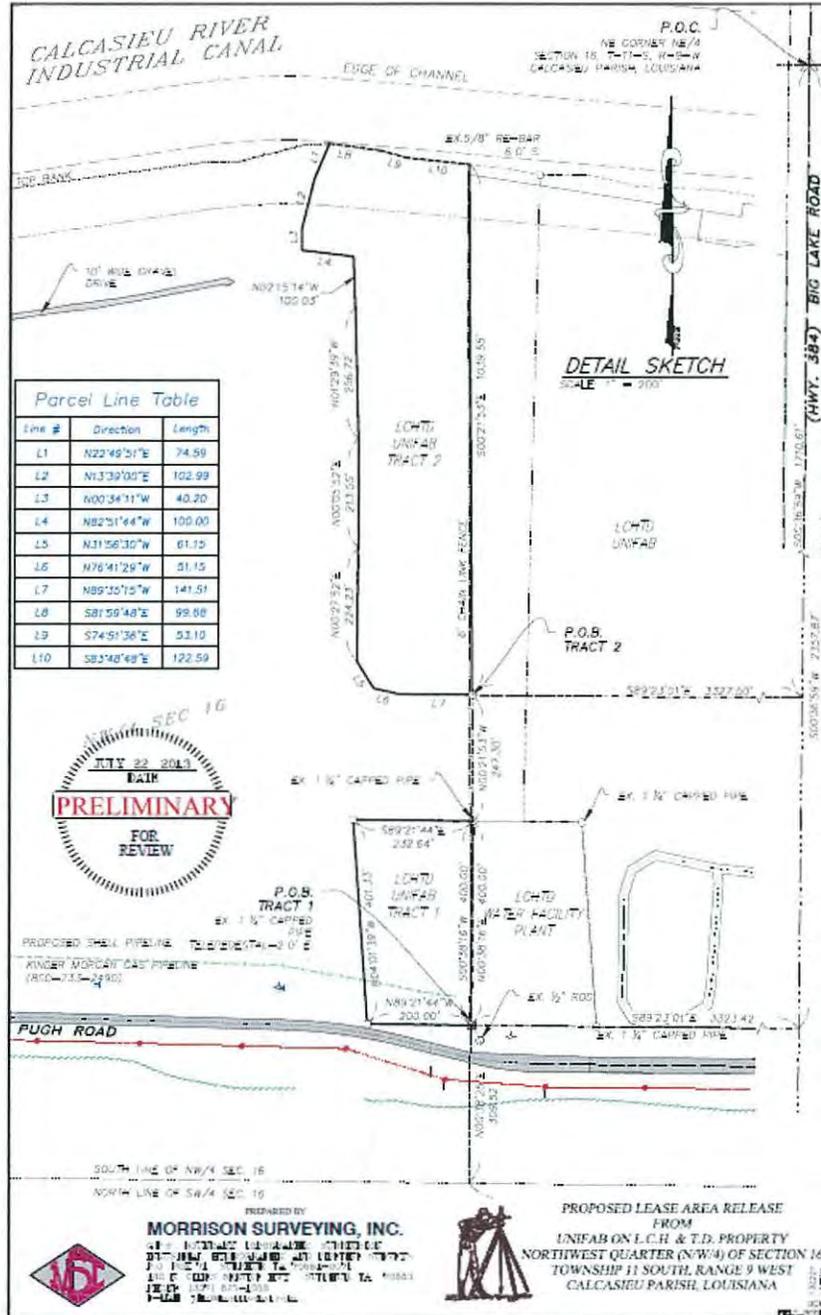


EXHIBIT 2

(Notice of Exercise)

[Date]

BG LNG Services, LLC
811 Main Street, Suite 3400
Houston, Texas 77002
Attention: Marc Hopkins or Marine Operations

Re: [Exercise of Option] [Extension of Option]

Dear Ladies and Gentlemen:

Reference is made to that certain Real Estate Lease Option Agreement dated as of _____, 2013 (the "Option Agreement") by and between Magnolia LNG, LLC, a Delaware limited liability company ("MAGNOLIA"), and BG LNG Services, LLC, a Delaware limited liability company ("BG"). All capitalized terms used in this letter shall have the meanings ascribed thereto in the Option Agreement.

This letter shall serve as written notice by MAGNOLIA to BG under the Option Agreement of MAGNOLIA's intention to [exercise its Option under the Option Agreement to enter into the Magnolia Sublease for the Magnolia Site] [extend the Option Agreement for the Extended Option Period].

No further action is required by BG in order for MAGNOLIA's [exercise of its Option] [extend the Option Agreement for the Extended Option Period] to be effective and upon delivery of this letter to the BG, MAGNOLIA shall be deemed to have [exercised its Option under the Option Agreement] [extended the Option Agreement for the Extended Option Period].

Very truly yours,

Magnolia LNG, LLC

By: _____
Its duly authorized signatory

ANNEX A

(Form of "Magnolia Sublease")

SUBLEASE AGREEMENT

THIS SUBLEASE AGREEMENT ("Secondary Sublease") is entered into this _____ day of _____, 2013 (the "Commencement Date"), by and between **BG LNG SERVICES, LLC**, a Delaware limited liability company (the "Sublessor"), and **MAGNOLIA LNG, LLC**, a Delaware limited liability company (the "Sublessee").

WITNESSETH:

WHEREAS, pursuant to the Restated and Amended Composite Lease (Turning Basin Properties) dated _____, 2013 (the "Prime Lease") between the Lake Charles Harbor & Terminal District (the "District") and Trunkline LNG Company, LLC, a Delaware limited liability company ("Trunkline"), Trunkline leased from the District certain property owned by the District, located in Calcasieu Parish, Louisiana (the "Prime Lease Property");

WHEREAS, pursuant to the Restated and Amended Sublease (Turning Basin Properties) dated _____, 2013 (the "Primary Sublease") between Sublessor and Trunkline, Sublessor subleased from Trunkline certain property covered by the Prime Lease (the "Primary Sublease Property");

WHEREAS, the Sublessee is desirous of subleasing from Sublessor a portion of the Primary Sublease Property consisting of that property described on Exhibit "A" and depicted on Exhibit "A-1" (the "Sublease Property").

WHEREAS, the Sublessor desires to sublease the Sublease Property to the Sublessee subject to the terms and conditions and for the consideration herein set forth.

NOW, THEREFORE, in consideration of the above recitals and the mutual covenants hereinafter contained, the parties herein covenant and agree as follows:

1. Definitions. As used in this Secondary Sublease, in addition to the defined terms set forth above, the following terms shall have the respective meanings indicated below:

"Adverse Event" shall mean the release into the air, land, or water of a Hazardous Substance, which release either poses a threat to the quality of air, water, land, fish, wildlife, or natural resources, or a threat of damage to person or property, and which will require remediation under CERCLA, 42 USC 9601 *et seq.*

"Applicable Laws" shall mean all present and future laws, ordinances, orders, rules and regulations of all federal, state, parish, and municipal governments, departments, commissions or offices, in each case having applicable jurisdiction over the Sublease Property, the Sublessor, or the Sublessee.

"Hazardous Substance" means any substance deemed hazardous under any of the following statutes, or under any other statute or regulation of any governmental authority: CERCLA, 42 USC 9601 *et seq.*; RCRA, 42 USC 6901 *et seq.*; HMTA, 49 USC 1801 *et seq.*; and TSCA, 15 USC 2601 *et seq.*; and the regulations promulgated thereunder.

“Impositions” means (i) all real or personal property taxes and assessments on any Sublessee Improvements that might be constructed on the Sublease Property and that are otherwise assessed on the Sublease Property (but not any income, transfer, gift, inheritance, estate, intangible personal property, corporation, or similar taxes imposed on the District by reason of its ownership of the Prime Lease Property or on Trunkline or the Sublessor by reason of its lease/sublease of the Primary Sublease Property), the personal property of Sublessee located on the Sublease Property or on the Sublessee’s interest in or under this Secondary Sublease, (ii) water and sewer rents, charges for public utilities, governmental excises, levies, license, impact and permit fees attributable to the Sublease Property and any property and equipment located thereon, including, if applicable, any water bottom usage fees allocable to the Sublease Property and (iii) other governmental charges which at any time during the term of this Secondary Sublease may be assessed, levied, confirmed, imposed upon or become due and payable in respect of or become a lien on the Sublessee Improvements that might be constructed on the Sublease Property or any part thereof or any appurtenance thereto.

“Person” means and includes natural persons, corporations, general partnerships, limited partnerships, limited liability companies, joint stock companies, joint ventures, associations, companies, trusts, banks, trust companies, land trusts, business trusts, or other organizations, whether or not legal entities, and governments and agencies and political subdivisions thereof.

“Port” means the Port of Lake Charles in Calcasieu Parish.

“Specified Use” means, without limitation, the loading, unloading, handling, treatment, processing, producing, transporting, distributing, selling, metering and/or storing of (i) natural gas, natural gas liquids, and other natural gas products, derivatives and by-products and (ii) other petroleum and hydrocarbon liquids, gases, products, derivatives and by-products, including, but not limited to, (A) the importation, regasification, production, exportation, liquefaction, refinement, enhancement, other treatment and transportation (including by ship, pipeline, truck or rail) of liquefied natural gas (“LNG”), and LNG by-products and additives and (B) the excavation for, development, construction, installation, use, operation, maintenance, repair, expansion, optimization, alteration and/or removal of any improvements, fixtures, facilities, equipment and/or appurtenances (including natural gas pipelines, natural gas liquids extraction, processing and delivery facilities, acid gas removal units, natural gas liquefaction trains, LNG regasification facilities, and other treatment facilities, cryogenic pipelines, LNG storage tanks, petroleum and other hydrocarbon liquids storage facilities, nitrogen storage and processing facilities, power generation and transmission infrastructure, marine, rail and trucking receipt, delivery and servicing facilities (including jetties, terminals, docks and loading and unloading equipment), and other utilities and facilities (including control rooms, offices, warehouses and yards), in each case, necessary, ancillary or desirable in connection with the performance of the foregoing purposes. Sublessee acknowledges and agrees that it will not utilize any dock on the Subleased Property for lay berth or vessel operations unrelated to the operation, construction, replacement or maintenance of the Sublessee Improvements or Subleased Property without the consent of the District, which consent may be conditioned on a mutually satisfactory revenue sharing arrangement.

“Sublessee Improvements” means, with respect to any buildings, structures, or improvements as may be erected on the Sublease Property by Sublessee, at any time and from time to time, those permanently attached things deemed to be immovables under Louisiana Civil

Code Articles 490-498.

“Sublessee’s Property” means all equipment, machinery, and other personal property of Sublessee and all severable fixtures of any kind placed on the Sublease Property by Sublessee consistent with its Specified Use of the Sublease Property.

“Sublessor-Created Lien” means any lien, charge, or encumbrance arising or resulting directly from acts or omissions of the Sublessor.

2. Sublease Property.

2.1 Sublessor’s Agreement to Sublease. Upon the terms and conditions hereinafter set forth, and in consideration of the payment of the Rents (hereinafter defined) and of the other charges due hereunder and the prompt performance by the Sublessee of the covenants and agreements to be kept and performed by the Sublessee under this Secondary Sublease, the Sublessor does sublease to the Sublessee, and the Sublessee hereby subleases from the Sublessor, the Sublease Property and any property and equipment located thereon for the Specified Use. Reasonable egress and ingress from and to the Sublease Property sufficient to permit the Sublessee to accomplish its purposes in connection with the Specified Use of the Sublease Property shall be made available by the Sublessor to the Sublessee as granted by Sublessor by Trunkline under the Primary Sublease and as granted by the District to Trunkline under the Prime Lease, provided that vehicular access to the Sublease Property shall be from existing entrances from Big Lake Road and Henry Pugh Boulevard. Sublessee acknowledges (i) that Seabulk Towing Services, Inc. (“Seabulk”) operates under the “Seabulk Sublease,” which covers certain property adjacent to and/or in the vicinity of the Sublease Property and (ii) that from time to time both Sublessee and Seabulk may have to make reasonable accommodations to each other in the exercise of rights and operations under their respective subleases. Sublessee further acknowledges (i) that Dynamic Industries, Inc. (“Dynamic”) operates under the “Dynamic Sublease” which covers certain property in the vicinity of the Sublease Property and (ii) that from time to time both Sublessee and Dynamic may have to make reasonable accommodations to each other in the exercise of rights and operations under their respective subleases. Sublessee further acknowledges (i) that Leevac Shipbuilding and Repair Calcasieu, L.L.C. (“Leevac”) operates under the “Leevac Sublease” which covers certain property in the vicinity of the Sublease Property and (ii) that from time to time both Sublessee and Leevac may have to make reasonable accommodations to each other in the exercise of rights and operations under their respective subleases. The parties acknowledge that this Secondary Sublease is subject to the terms of the Primary Sublease.

3. Term.

3.1 Initial Term and Extensions. The term of this Secondary Sublease shall be the period commencing on the Commencement Date and expiring on December 31, 2022, unless sooner terminated as hereinafter provided (the “Initial Term”).

3.2 Renewal Options. In consideration of and conditioned upon Sublessee being in full compliance with all terms and conditions set forth herein, Sublessor hereby grants unto Sublessee the option (“Renewal Options”) to sublease the Sublease Property for six (6) additional consecutive terms of ten (10) years each (each, an “Option Term” or “Option Terms”)

on the same terms and conditions as set forth in this Secondary Sublease. To exercise its option to sublease the Sublease Property during any Option Term, Sublessee need take no action whatsoever. It is presumed Sublessee elects to exercise its right to extend the lease during each Option Term; so, unless Sublessee notifies the Sublessor, not less than one hundred twenty (120) days prior to the expiration of any term, that it elects to waive its right to extend this Secondary Sublease beyond the term in question, the Secondary Sublease will be extended for the next Option Term. Any election to waive the right to sublease during any Option Term will terminate Sublessee's rights to sublease during any later Option Term.

3.3 All of the terms and conditions of this Secondary Sublease shall be applicable to any Option Term, and the rental shall be determined in accordance with Section 4 below. If Sublessee shall elect to exercise any Renewal Option (automatic as set forth in Section 3.2), then Sublessor shall timely renew the Primary Sublease, at least with respect to the Sublease Property, and pursuant to the intervention set forth herein by District and Trunkline, Trunkline shall timely renew its renewal options under the Prime Lease, at least with respect to the Sublease Property and District shall permit renewal of the Sublease Property only, in the event that Trunkline does not desire to renew with respect to the other Lease Property.

4. Rent.

4.1 Rent. The Sublessee shall pay to the Sublessor annual rental of EIGHTEEN THOUSAND FOUR HUNDRED THIRTY FIVE and 00/100ths (\$18,435.00) Dollars, with this amount having been paid by Sublessee at or prior to the Commencement Date with respect to the first Contract Year (The "Base Rent"). The amount of Base Rent shall be fixed for the first three (3) Contract Years, and shall be paid annually in advance on or before each anniversary of the Commencement Date during the first three (3) Contract Years. Thereafter, the Base Rent shall be adjusted and paid as set forth in Section 4.2 below. As used herein, the term "Contract Year" under this Secondary Sublease shall mean any full twelve (12) month period during either the Initial Term or any Option Term commencing, for the first such period, on the Commencement Date and, thereafter, on each anniversary of the Commencement Date.

4.2 CPI Adjustment. Commencing with the fourth (4th) Contract Year and continuing during the remainder of the Initial Term and any applicable Option Term, the Base Rent shall be adjusted, effective as of the beginning of each Contract Year (each an "Adjustment Date"), by a percentage equal to the CPI Percentage Increase (as defined below), and shall be paid annually in advance for each such Contract Year within thirty (30) calendar days after each Adjustment Date (in order to permit Sublessee to calculate the CPI Percentage Increase, as set forth below). The term "Consumer Price Index" shall mean the unadjusted Consumer Price Index for All Urban Consumers (CPI-U), All Items, U.S. City Average 1982-84=100, calculated and published by the United States Department of Labor, Bureau of Labor Statistics. In the event the Consumer Price Index is discontinued, the parties shall accept comparable statistics on the purchasing power of the consumer dollar as published at the time of said discontinuation by a responsible periodical of recognized authority to be chosen by the parties. The term "CPI Percentage Increase" shall mean, with respect to any Contract Year for which a CPI Percentage Increase is being calculated, the percentage increase calculated by subtracting the average Consumer Price Index for the last month prior to the preceding Contract Year, from the average

Consumer Price Index for the last month prior to the Contract Year for which a CPI Percentage Increase is being calculated, and dividing the positive difference, if any, by the average Consumer Price Index for the last month prior to the preceding Contract Year, and multiplying this quotient (rounded to the nearest ten thousandth) by 100. For illustrative purpose only, if the average Consumer Price Index for the last month prior to the Contract Year for which a CPI Percentage Increase is being calculated was 200.0, and the average Consumer Price Index for the last month prior to the preceding Contract Year was 175.0, then the CPI Percentage Increase would be 14.29% (i.e., $200.0 - 175.0 = 25.0 / 175.0 = 0.1429 \times 100 = 14.29\%$). No adjustment to Base Rent shall reduce the amount of Base Rent to an amount that is less than the Base Rent, as adjusted, due for the preceding Contract Year. The CPI Percentage Increase for any Contract Year shall be calculated by Sublessee, and Sublessee shall deliver written notice describing such calculation in reasonable detail ("CPI Notice"), together with adjusted annual Base Rent for such Contract Year, no later than thirty (30) calendar days after the commencement of the applicable Contract Year. If Sublessor disagrees with Sublessee's calculation of the CPI Percentage Increase, then Sublessor shall deliver to Sublessee written notice, describing the basis for such disagreement in reasonable detail ("CPI Disagreement Notice"), not later than thirty (30) calendar days after delivery of the CPI Notice. If Sublessor fails to deliver a CPI Disagreement Notice within thirty (30) calendar days after delivery of any CPI Notice, then Sublessor shall be conclusively deemed to have agreed with the calculation of the CPI Percentage Increase set forth in such CPI Notice. In the event of delivery of a CPI Disagreement Notice, upon resolution and agreement between the parties, the parties shall make an adjustment to the Base Rent previously paid with respect to such Contract Year.

4.3 Place of Payment. Base Rent shall be payable to Sublessor via funds mailed to Gulf Coast Facilities Management, LLC, 826 Union Street, Suite 200, New Orleans, Louisiana 70112, or such other address as the Sublessor may specify by written notice to the Sublessee, from time to time.

4.4 Independent Covenants. The obligation to pay Base Rent and any other sums due pursuant to this Secondary Sublease are covenants that are independent of all other covenants under this Secondary Sublease, and no Force Majeure Event (hereinafter defined) will relieve Sublessee of the obligation to pay Base Rent and all other sums due under this Secondary Sublease. Further, the term "Rent" as sometimes used herein shall include Base Rent and all other sums due and payable under this Secondary Sublease.

5. Net Sublease: Taxes and Utility Expenses: Road Costs.

5.1 Net Sublease. This Secondary Sublease is a net sublease and it is agreed and intended that the Sublessee shall pay or cause to be paid all operating costs, repair costs, and Impositions of every kind and nature whatsoever. The Sublessee shall pay to the Sublessor absolutely net throughout the term of this Secondary Sublease, the rent, operating costs, repair costs, Impositions, and other payments hereunder, free of any charge, assessments, Impositions, expenses, or deductions of any kind related to the Sublease Property, and without abatement, deduction or set off, except as expressly otherwise provided in this Secondary Sublease.

5.2 Taxes and Utility Expenses.

(a) Subject to Section 5.2(b) hereof, the Sublessee shall pay or cause to be paid, before any fine, penalty, interest, or cost may be added thereto for the nonpayment thereof, of all Impositions.

(b) The Sublessee shall bear the burden of and shall make timely remittances of all Impositions and shall file timely, with appropriate governmental units, all returns, statements, and reports legally required with respect thereto. The Sublessee shall promptly remit to any governmental unit any such Imposition, unless the Sublessee shall in good faith, with due diligence, and by appropriate judicial or administrative proceedings, contest the validity, applicability, or amount thereof. The Sublessee shall give the Sublessor ten (10) days' prior written notice of the Sublessee's intent to contest such Imposition. Any such contest shall be at the Sublessee's sole cost and expense.

(c) The Sublessee, upon the request of the Sublessor, shall furnish to the Sublessor, within fifteen (15) days after the date when an Imposition becomes delinquent if not paid, official receipts of the appropriate taxing authority or other evidence satisfactory to the Sublessor evidencing the payment thereof. The certificate, advice or bill of non-payment of such Imposition issued by the proper official designated by law to make or issue the same or to receive payment of an Imposition shall be prima facie evidence that such Imposition is due and unpaid at the time of the making of such certificate, advice, or bill.

(d) Except as expressly otherwise provided herein, nothing contained herein shall modify, amend, or constitute a waiver of, expressly or by implication, any applicable taxes or Impositions with respect to the Sublease Property and any property and equipment located thereon.

5.3 Utility Connections. The Sublessee shall be responsible for obtaining, at its own cost and expense, electricity, telephone and any and all other utility services to the Sublease Property.

6. Sublessee Improvements; Maintenance; and Use.

6.1 The Sublessee shall, at its sole cost and expense provide security lighting for the Sublease Property, and provide fencing between the Sublease Property and adjacent property, with the type and manner of such security lighting and fencing as prescribed by Applicable Laws. Sublessee may, at its sole cost, construct Sublessee Improvements at any time and from time to time as it deems necessary and appropriate in accordance with the Specified Use, subject at all times to the terms and conditions of Section 6 of the Prime Lease and of the Primary Sublease with respect to the District's approval of plans and specifications therefor (and neither BG nor Trunkline shall have any rights of approval whatsoever with respect to the Sublessee Improvements). Any Sublessee Improvements shall remain the property of the Sublessee during the term of this Secondary Sublease and any Sublessee Improvements demolished and removed by Sublessee pursuant to the preceding sentence shall remain the property of Sublessee and Sublessee may retain any amounts received for salvage or otherwise.

In the event that Sublessee fails to (i) provide security lighting for the Sublease Property, and (ii) provide fencing between the Sublease Property and adjacent property, as prescribed by

Applicable Laws, Sublessor reserves the right to arrange for same at Sublessee's expense. Upon the request of Sublessor, any such costs, fees or expenses incurred by Sublessor on Sublessee's behalf shall be payable within fifteen (15) days' notice thereof.

6.2 Sublessee Improvements - Compliance with Primary Sublease and with Laws. The Sublessee Improvements, if any, shall comply with any restrictions and requirements of the Primary Sublease and all applicable laws, ordinances, zoning regulations, rules and regulations of all federal, state, parish, municipal, or other governmental or public authorities and agencies having jurisdiction thereof.

6.3 Sublessee's Property. All of Sublessee's Property shall at all times be and remain the sole property of the Sublessee. The Sublessee shall be obligated to remove Sublessee's Property from the Sublease Property within one hundred eighty (180) days after the expiration or termination of this Secondary Sublease provided the Sublessee repairs any damage caused by such removal.

6.4 Maintenance of Sublease Property. During the continuance of this Secondary Sublease, the Sublessee shall, at its expense, keep the Sublease Property in a reasonably good state of maintenance, repair, and cleanliness. This includes the obligation to maintain all grassed areas to a maximum height of eight inches and to maintain the grassed areas and the concrete pad of the Sublease Property, if any, free from weeds. The parties hereto acknowledge that Sublessor will employ a subcontractor to ensure that any electrical supplies and equipment located or used on the Sublease Property are maintained to the correct specifications as outlined by the respective manufacturers, with the direct cost for this maintenance to be borne by Sublessee for any electrical supplies or equipment located or used on the Sublease Property.

6.5 Alterations. Sublessee may, at its sole cost, make any alterations to the Sublessee Improvements at any time and from time to time as it deems necessary and appropriate in accordance with the Specified Use, subject to the District's consent requirements set forth in Section 6.8 of the Prime Lease and Primary Sublease.

7. Acceptance of Sublease Property.

Sublessee accepts the Sublease Property and any property and equipment located thereon as suitable for its Specified Use and in its condition as of the Commencement Date, and assumes responsibility therefor to the fullest extent allowed by LSA-RS.9:3221. Sublessee expressly waives and releases Sublessor from all warranties pertaining to the condition of the Sublease Property, including, but not limited to, any warranty against visible, hidden, or latent defects, and Sublessee does also waive any right Sublessee may or might have relative thereto (i) to rescind or revoke this Secondary Sublease on the basis of any such warranty, and (ii) except for any damage to the Sublease Property arising from the gross negligence or willful misconduct of Sublessor or its employees, contractors or agents after the Commencement Date, to have Sublessor repair or replace all or any part of the Sublease Property and any component parts, improvements, equipment, fixtures and any other items that might be relative to the Sublease Property. Except for any damage to the Sublease Property arising from the gross negligence or willful misconduct of Sublessor or its employees, contractors or agents after the Commencement

Date, Sublessor shall not be required to make any improvement or repairs of any kind or character to the Sublease Property during the term of this Secondary Sublease, and Sublessee shall assume all responsibility for the Sublease Improvements and repairs necessary or desirable in connection with the Sublessee's use of the Sublease Property. To the extent that the Sublease Property or any property or equipment located thereon requires repair, modification, or alterations to comply with any Applicable Laws, Sublessee shall make such repairs, modifications, or alterations and, further, shall confirm with the appropriate governmental entity or agency that such repairs, modifications, or alterations have caused such property to be in compliance with any such Applicable Laws.

8. Sublessee's Surrender of Sublease Property.

8.1 Surrender at End of Secondary Sublease. All Sublessee Improvements constructed or placed upon, in, under, over, or through the Sublease Property by Sublessee, shall remain the property of Sublessee and may be removed by Sublessee at any time during the Initial Term or any Option Term, subject and subordinate to Section 12.6 and the rights of any Leasehold Lender under any Leasehold Mortgage. Subject and subordinate to Section 12.6 and the rights of any Leasehold Lender under any Leasehold Mortgage, upon the expiration or termination of this Secondary Sublease, Sublessor may elect, in its sole discretion, by delivery to Sublessee of written notice thereof (a "Surrender Election Notice"), to require Sublessee to either surrender possession of the Sublessee Improvements that are permanently attached to the ground upon the Sublease Property (collectively, "Permanent Facilities"), at no cost to Sublessor, in which case such Permanent Facilities shall be surrendered to Sublessor in their "as-is, where-is" condition, with all defects) or remove the Permanent Facilities (provided, however, that in no event shall Sublessee be required to remove any docks, berths, wharves, electrical interconnection infrastructure, roadways, rail lines, underground pipelines, fill materials, foundations, or other underground Sublessee Improvements, all of which may be abandoned in place in accordance with applicable laws). With respect to any scheduled expiration of this Secondary Sublease, Sublessor shall deliver the Surrender Election Notice to Sublessee not less than twenty-four (24) months prior to scheduled expiration of the Initial Term or Option Term, as applicable. With respect to any earlier termination of this Secondary Sublease, Sublessor shall deliver the Surrender Election Notice to Sublessee as soon as reasonably practicable, but not more than ten (10) calendar days after the effective date of such termination (the "Early Termination Date"). If Sublessor elects to require removal of the Permanent Facilities, then Sublessee shall have an additional period of up to twenty-four (24) months after the scheduled expiration of this Secondary Sublease or the Early Termination Date, as applicable (the "Removal Period"), to complete such removal in accordance with this paragraph, in which case the terms and conditions of this Secondary Sublease shall continue to apply during such Removal Period, except that Sublessee shall not be obligated to pay Base Rent, additional rent, Impositions, and other charges herein during the Removal Period and Sublessee may not use the Sublease Property for any purpose other than removal of the Permanent Facilities. Sublessee shall continue to have the right to use Henry Pugh Boulevard for ingress, egress and access to, from and between the Sublease Property and Big Lake Road during the Removal Period. With respect to Sublessee Improvements that are not Permanent Facilities, Sublessee shall remove such Sublessee Improvements not later than one hundred eighty (180) calendar days after the scheduled expiration of this Secondary Sublease or the Early Termination Date, as applicable. Subject and subordinate to Section 12.6 and the rights of any Leasehold Lender under any

Leasehold Mortgage, any Sublessee Improvements that are not removed by the time fixed for such removal in this paragraph shall be irrevocably deemed to be abandoned by Sublessee, and Sublessor may elect, in its sole discretion, to remove such Sublessee Improvements from the Sublease Property at Sublessee's sole cost (less any salvage value received by Sublessor) and may dispose of such Sublessee Improvements without notice or liability to Sublessee, provided, however, that title to any such Sublessee Improvements that Sublessor does not remove from the Sublease Property shall automatically pass to Sublessor. In no event shall Sublessee be required to restore the Sublease Property to their condition prior to construction of the Sublessee Improvements or to restore any alterations of the Sublease Property, and Sublessee shall surrender the Sublease Property upon the expiration or earlier termination of this Secondary Sublease (as the same may be extended by the Removal Period) in their "as-is, where-is" condition, with all defects (provided, however, that in no event Sublessee shall be excused from any default of Sublessee's obligations under this Secondary Sublease). If the Sublessee holds over after the expiration or termination of this Secondary Sublease, with or without the consent of the Sublessor, such tenancy shall be from month-to-month only. Such month-to-month tenancy, whether with or without the Sublessor's consent, shall be subject to every other term, covenant, and agreement contained herein, and shall not constitute a renewal or extension of the term of this Secondary Sublease. Sublessor shall not be responsible for any loss or damage occurring to any Sublessee Improvements owned, leased, or operated by the Sublessee, its agents, or employees, prior to or subsequent to the termination of this Secondary Sublease, other than, to the extent required by law, for such loss or damage occurring as a result of the negligent conduct or the willful misconduct or gross negligence of the Sublessor, its officers, representatives, agents, contractors or employees or the Sublessor's misrepresentations or its breach of or default under this Secondary Sublease.

8.2 Sublessor Not Liable. The Sublessor, acting in its capacity as Sublessor hereunder, shall not be responsible for any loss or damage occurring to the Sublessee Improvements or to any other real or personal property owned, leased, or operated by the Sublessee, its agents, or employees, prior to or subsequent to the termination of this Secondary Sublease, other than, to the extent permitted by law, for such loss or damage occurring as a result of the gross negligence or willful misconduct of the Sublessor, its officers, representatives, agents, or employees or the Sublessor's misrepresentations or its breach of or default under this Secondary Sublease.

9. Specified Use; Environmental Assessment; Remediation.

9.1 No Unlawful Activities. The Sublessee agrees not to make any unlawful use of the Sublease Property or Sublessee Improvements, if any, including, without limitation, any use constituting a nuisance of the Sublease Property or to adjoining or neighboring property and, further, Sublessee shall at all times comply and observe all Applicable Laws.

9.2 Permitted Uses. The Sublessee covenants not to use or permit the Sublease Property to be used for any purpose other than (i) its Specified Use, or (ii) such other uses as may be approved by the Sublessor and District in writing, which approval shall not be unreasonably withheld, conditioned or delayed. Further, Sublessee shall not use or permit the Sublease Property to be used for any use that would violate Sublessee's obligations in Section 9.3 of the Primary Sublease.

9.3 Physical Diminishment or Degradation. The Sublessee shall not cause, allow, or suffer to exist any physical diminishment or degradation of the Sublease Property, except to the extent beyond the reasonable control of Sublessee. However, this provision shall not apply with respect to any physical damage or degradation to the shoreline or bulkhead portion of the Sublease Property, if any (except to the extent caused by Sublessee). The parties acknowledge that Sublessor may or may not address the maintenance and repair of the shoreline and/or bulkhead during the term hereof.

9.4 Security. As provided in Section 6.1 hereto, Sublessee shall be responsible for providing security lighting and fencing for the Sublease Property. Any Imposition, fine, or penalty imposed for the failure of Sublessee to comply with such requirements under Applicable Laws, including any imposition, fine, or penalty imposed upon the District as owner of the Sublease Property, or upon Trunkline as the sublessor under the Primary Sublease, or upon Sublessor as the sublessee under the Primary Sublease, shall be the sole responsibility of Sublessee and Sublessee shall indemnify and hold harmless the Sublessor from the payment of any such Imposition, fine, or penalty.

9.5 Environmental Assessment; Remediation.

(a) Environmental Assessments. Prior to the Commencement Date, Sublessee shall arrange for a Phase 1 environmental assessment of the Sublease Property (the "Effective Date Phase 1") to be performed by a qualified environmental engineer mutually approved by Sublessor and Sublessee, with the costs of such effective date Phase 1 to be paid by Sublessee. If the Effective Date Phase 1 indicates that a Phase 2 environmental assessment would be prudent, Sublessor will arrange for a Phase 2 environmental assessment (the "Effective Date Phase 2") to be performed at its cost by the same or another qualified environmental engineer mutually approved by Sublessor and Sublessee. Upon termination of this Secondary Sublease, Sublessor and Sublessee shall jointly arrange for another Phase 1 environmental assessment (the "Termination Phase 1") to be performed by the same or another qualified environmental engineer mutually approved by Sublessor and Sublessee, with the costs of such Termination Phase 1 to be shared equally by Sublessor and Sublessee. To the extent that the Termination Phase 1 discloses that Sublessee has caused any environmental conditions that were not previously disclosed by the Effective Date Phase 1 ("New Conditions"), Sublessee shall promptly remediate such New Conditions in accordance with all Applicable Laws. Sublessor and Sublessee shall retain the same or another qualified environmental consultant mutually approved by Sublessor and Sublessee (an "Environmental Consultant"), at their joint cost, to determine if Sublessee has remediated such new Conditions in accordance with all Applicable Laws. If the Environmental Consultant determines that Sublessee has not remediated such New Conditions in accordance with all Applicable Laws, Sublessee shall recommence such remediation until the Environmental Consultant is satisfied. Where appropriate, in the Environmental Consultant's discretion, the Environmental Consultant shall request and receive the written approval of the Sublessee's remediation from the applicable governmental department or agency, before approving the Sublessee's remediation.

(b) Notices; Adverse Events. If, during the term hereof, Sublessee receives notice of violation of any environmental law, regulation, statute, ordinance, policy, or order related to Sublessee's operations hereunder (a "Notice") or there is an Adverse Event

caused by Sublessee relating to the Sublease Property or other property within the vicinity of the Sublease Property in which Sublessee has an interest, then Sublessee shall notify Sublessor of such violation or Adverse Event, providing copies of the Notice or any other relevant materials. Further, if such Notice or Adverse Event pertains to Sublessee's operations on the Sublease Property itself, then Sublessee agrees to promptly remediate such violation or Adverse Event in accordance with all Applicable Laws. As provided above, Sublessor shall, at Sublessee's cost, retain an Environmental Consultant to determine if the Sublessee has remediated such conditions in accordance with the requirements of the Notice and/or all Applicable Laws. If the Environmental Consultant determines that the Sublessee has not remediated the violation or the Adverse Event in accordance with the Notice and/or all Applicable Laws, then Sublessee shall recommence such remediation until the Environmental Consultant is reasonably satisfied. Where appropriate, in the Environmental Consultant's discretion, the Environmental Consultant shall request and receive written approval of the Sublessee's remediation from the applicable governmental agency or department, before approving the Sublessee's remediation.

10. Indemnification.

10.1 Sublessee's General Agreement to Indemnify. The Sublessee releases District, Trunkline, Sublessor, their respective officers, representatives, employees, agents, successors and assigns, (individually and collectively, "Sublessor Indemnitee") from, and Sublessee assumes any and all liability for, and agrees to indemnify the Sublessor Indemnitee against all claims, liabilities, obligations, damages, penalties, litigation, costs, charges, and expenses (including, without limitation, reasonable attorney's fees, engineers' fees, architects' fees, and the costs and expenses of appellate action, if any), imposed on, incurred by or asserted against the Sublessor Indemnitee arising out of (i) the Specified Use or occupancy of the Sublease Property and any property or equipment located thereon by the Sublessee, its officers, representatives, agents, and employees, (ii) the construction or operation of Sublessee Improvements, or (iii) activities on or about the Sublease Property and any property or equipment located thereon by the Sublessee, its officers, representatives, agents, and employees, of any nature, whether foreseen or unforeseen, ordinary, or extraordinary, in connection with the Specified Use and occupancy of the Sublease Property and any property or equipment located thereon by the Sublessee, its officers, representatives, agents, and employees; provided, however, that any such claim, liability, obligation, damage or penalty arising solely as a result of the negligence or willful misconduct of the Sublessor Indemnitee shall be excluded from this indemnity. The indemnity provided in this section shall include within its scope any liability imposed by law on the District, Trunkline, or Sublessor on a strict liability theory for physical defects in the Sublease Property caused or created by Sublessee and any property or equipment owned, controlled, leased, subcontracted or operated by Sublessee located thereon except for any physical defects located on property covered by the Seabulk Sublease, the Dynamic Sublease or the Leevac Sublease. This section shall include within its scope but not be limited to any and all claims or actions for wrongful death, but any and all claims brought under the authority of or with respect to any local, state, or federal environmental statute or regulation shall be covered by Section 10.2 and not this Section 10.1.

10.2 Sublessee's Environmental Indemnification. The Sublessee agrees that it will comply with all environmental laws and regulations applicable to the Sublessee, including without limitation, those applicable to the use, storage, and handling of Hazardous Substances in,

on, or about the Sublease Property. The Sublessee agrees to indemnify and hold harmless each of the Sublessor Indemnitee against and in respect of, any and all damages, claims, losses, liabilities, and expenses (including, without limitation, reasonable attorneys, accounting, consulting, engineering, and other fees and expenses), which may be imposed upon, incurred by, or assessed against any of the Sublessor Indemnitee by any other party or parties (including, without limitation, a governmental entity), arising out of, in connection with, or relating to the subject matter of (a) the Sublessee's breach of the covenant set forth above in this Section 10.2 or (b) any environmental condition of contamination on the Sublease Property or any violation of any federal, state, or local environmental law with respect to the Sublease Property first occurring after the commencement of the Initial Term of this Secondary Sublease and caused by the Sublessee's Specified Use of and its activities and operations on the Sublease Property and any property or equipment located thereon.

10.3 Survival of Indemnities. The foregoing indemnities shall survive the term of this Secondary Sublease and shall be in addition to any of the Sublessee's obligations for breach of a representation or warranty.

11. Insurance.

11.1 Commercial Liability. The Sublessee agrees to carry or cause to be carried commercial general liability insurance with respect to the Sublease Property and the property and equipment located thereon and the Specified Use and activities of the Sublessee thereon in the minimum combined single limit amount of Ten Million dollars (\$10,000,000) per occurrence and a general aggregate limit of at least Twenty Million dollars (\$20,000,000) for the death of or personal injury to one or more persons and for property damage for each occurrence in connection with the Sublease Property and the property and equipment located thereon and the Specified Use thereof or activities of the Sublessee thereon, and same shall include the Sublessor, Trunkline, and the District as additional insureds with respect to any matters arising out of this Secondary Sublease. Such insurance policy shall contain a provision or be accompanied by a certificate or endorsement to the effect that the insurance company shall not cancel or materially modify such policy without first giving written notice thereof to the Sublessor at least thirty (30) days in advance of such cancellation or material modification. At Sublessor's request, the Sublessee shall promptly provide to Sublessor certificates evidencing such insurance and shall furnish copies of such policies to Sublessor within five (5) working days.

11.2 Personal Property. The Sublessee also covenants and agrees to carry or cause to be carried "all risk" coverage or "causes of loss special form" (as such terms are used in the State of Louisiana) property insurance covering the full replacement value of the Sublease Property, all property and equipment located thereon, all Sublessee Improvements, all of Sublessee's Property, and all Equipment. Such insurance policy shall contain a provision or be accompanied by a certificate or endorsement to the effect that the insurance company shall not cancel or materially modify such policy without first giving written notice thereof to the Sublessor at least thirty (30) days in advance of such cancellation or material modification. At the Sublessor's request, the Sublessee shall promptly provide to Sublessor certificates evidencing such insurance and shall furnish copies of such policies to Sublessor within five (5) working days.

11.3 Workers' Compensation. The Sublessee further covenants and agrees, at its expense, to carry and maintain at all times, all necessary workers' compensation insurance covering all persons employed by Sublessee in and about the Sublease Property to the extent required by Applicable Laws, including, without limitation, Longshoremen's and Harbor Workers' Compensation insurance.

11.4 Excess Liability. The Sublessee further covenants and agrees to carry or cause to be carried excess liability coverage in the minimum single limit amount of Ten Million dollars (\$10,000,000) per occurrence in connection with the Sublease Property and the property and equipment located thereon and the Specified Use thereof or activities of the Sublessee thereon and same shall include Sublessor, Trunkline, and the District as additional insureds with respect to any matters arising out of this Secondary Sublease. Such insurance policy shall contain a provision or be accompanied by a certificate or endorsement to the effect that the insurance company shall not cancel or materially modify such policy without first giving written notice thereof to Sublessor at least thirty (30) days in advance of such cancellation or material modification. At the Sublessor's request, the Sublessee shall promptly provide to Sublessor certificates evidencing such insurance and shall furnish copies of such policies to Sublessor within five (5) working days.

11.5 Qualification for Insurer. All insurance policies required above shall comply with the requirements contained in Section 1.3 of the Prime Lease, including, without limitation, approvals by the District (and neither BG nor Trunkline shall have any rights of approval whatsoever with respect such matters).

11.6 Waiver of Subrogation. Sublessee and Sublessor shall ensure that any insurance policy covering the Sublease Property shall contain a waiver of subrogation against Sublessor and Sublessee, as the case may be.

12. Liens and Mortgages.

12.1 Prohibition of Liens and Mortgages. The Sublessee shall not create or permit to be created or to remain in connection with the Sublease Property or any other portion of the other Primary Sublease Property and the property and equipment located thereon or the Sublessee's Specified Use of and activities thereon, any liens or mortgages against any property interest of the Sublessor, Trunkline, or the District in the Sublease Property or any other portion of the other Primary Sublease Property and any property and equipment located thereon, and the Sublessee shall discharge any lien, encumbrance, or charge (levied on account of any Imposition or any mechanics', laborers', or materialmen's lien or security agreement) which might be or become a lien, encumbrance, or charge upon the Sublessor's, Trunkline's, or the District's interest in the Sublease Property, any part thereof, or any property or equipment located thereon in accordance with Section 12.2 hereof.

12.2 Discharge of Liens. If any mechanics', laborers', or materialmen's lien (other than a Sublessor-Created Lien) shall at any time be filed against the Sublessor's, Trunkline's, or the District's interest in the Sublease Property or any other portion of the other Primary Sublease Property, any part thereof, or any property or equipment located thereon, in connection with the Specified Use of the Sublease Property and any property or equipment

located thereon, or the Sublessee's activities thereon, the Sublessee, within 30 days after notice of the filing thereof, shall elect to contest the same or cause the same to be discharged of record by payment, deposit, bond, order of a court of competent jurisdiction or otherwise. If the Sublessee does not contest such lien and shall fail to cause such lien to be discharged within the period aforesaid, then in addition to any other right or remedy of the Sublessor hereunder, the Sublessor may, but shall not be obligated to, discharge the same either by paying the amount claimed to be due or by procuring the discharge of such lien by deposit or by bonding proceedings, and in any such event the Sublessor shall be entitled, if the Sublessor so elects, to compel the prosecution of an action for the termination of such lien by the lien or with interest, attorneys' fees, costs, and allowances. Any amount so paid by the Sublessor and all costs and expenses incurred by the Sublessor in connection therewith, including reasonable attorneys' fees together with interest thereon at one percent (1%) per annum above the prime rate of interest quoted from time to time in the Wall Street Journal, from the respective dates of the Sublessor's making of the payment or incurring of the cost and expense, shall constitute additional rent payable by the Sublessee under this Secondary Sublease and shall be paid by the Sublessee to the Sublessor within fifteen (15) days of written demand therefor.

12.3 Sublessor Not Liable For Mechanic's Liens. Nothing herein contained shall be deemed or construed in any way to constitute the consent of or request by the Sublessor, express or implied, to a contractor, subcontractor, laborer or materialman for the performance of any labor or the furnishing of any materials for any specific improvement, alteration to or repair of the Sublease Property, the Sublessee Improvements, if any, any part thereof, or any property or equipment located thereon. NOTICE IS HEREBY GIVEN THAT THE SUBLESSOR SHALL NOT BE LIABLE FOR ANY LABOR OR MATERIALS FURNISHED OR TO BE FURNISHED TO THE SUBLESSEE UPON CREDIT AND THAT NO MECHANIC'S OR OTHER LIEN FOR ANY SUCH LABOR OR MATERIALS SHALL ATTACH TO OR AFFECT THE REVERSIONARY OR OTHER INTEREST OF THE SUBLESSOR IN AND TO THE SUBLEASE PROPERTY, THE SUBLESSEE IMPROVEMENTS, IF ANY, AND ANY PROPERTY OR EQUIPMENT LOCATED THEREON.

12.4 Consent to Ground Subleasehold Mortgages. The Sublessee may not encumber the Sublease Property or any physical interest connected to this Secondary Sublease, but Sublessee may enter into a sub-leasehold mortgage on its interest in this Secondary Sublease.

12.5 Permitted Financial Use of Sublease. Sublessee may assign its interest in the Secondary Sublease for purposes of obtaining financing subject always to the prohibitions of 12.4 and 12.6.

12.6 Lender Protection Provisions. The provisions of this Section 12.6 shall supersede any contrary or inconsistent provisions in this Secondary Sublease and in the event of any inconsistency or conflict between the provisions of this Section and any other provision of this Secondary Sublease, the provisions of this Section shall govern and control.

(a) Sublessee's Right to Mortgage Leasehold Interest; Recognition of Leasehold Lender as Leasehold Mortgagee. Sublessee shall have the absolute right (but not the obligation), without seeking the consent or approval of Sublessor, to grant one or more leasehold mortgages encumbering Sublessee's interest in this Secondary Sublease and the Sublease

Property. The term "Leasehold Lender" shall mean, at any point in time, the holder of a Leasehold Mortgage that provides written notice to Sublessor of its status as such. The term "Leasehold Mortgage" shall mean, at any point in time, a leasehold mortgage to secure debt or other equivalent instruments, as the case may be (as the same may be amended from time to time), encumbering Sublessee's interest in the Sublease Property and this Secondary Sublease. It is acknowledged and agreed that, during the term of this Secondary Sublease, there may be multiple Leasehold Mortgages and multiple Leasehold Lenders and that each Leasehold Lender may, from time to time, assign its right, title and interest in and to the Leasehold Mortgage and this Secondary Sublease.

(b) Right to Perform for Sublessee; Right to Cure.

(i) In addition to the rights provided in Section 12.6(a), Sublessor acknowledges and agrees that Leasehold Lender shall have the right to perform any term, covenant, condition or agreement to be performed by Sublessee under this Secondary Sublease, and Sublessor shall accept such performance by Leasehold Lender with the same force and effect as if furnished by Sublessee. In the event of a default by Sublessee under this Secondary Sublease and prior to any termination of this Secondary Sublease by Sublessor, Sublessor acknowledges and agrees that Sublessor shall provide Leasehold Lender with notice of the same and Leasehold Lender shall have the right (but not the obligation) to commence to cure such default within the same period of time as Sublessee has under this Secondary Sublease, plus an additional sixty (60) calendar days. Sublessor agrees that Sublessor shall not terminate this Secondary Sublease in connection with any such default so long as Leasehold Lender has cured or commenced to cure and continues diligently to cure in accordance with the foregoing (A) any such non-payment default and (B) any such default in the payment of any portion of Rent, Impositions or other charges due hereunder.

(ii) If any default in the performance of an obligation of Sublessee under this Secondary Sublease is not susceptible to being cured by Leasehold Lender, Sublessor shall have no right to terminate this Secondary Sublease with respect to such default and such default shall be deemed waived for the benefit of Leasehold Lender only, provided that:

(1) Leasehold Lender shall have commenced to cure (i) any other nonpayment default of Sublessee that is susceptible to being cured by Leasehold Lender and (ii) any default in the payment of any portion of Rent, Impositions or other charges due hereunder, in each case, within the time periods prescribed under Section 12.6(b)(i), above;

(2) Leasehold Lender (or its designee) shall have commenced to acquire Sublessee's interest in this Secondary Sublease and the Sublease Property or to commence foreclosure or other appropriate proceedings under the Leasehold Mortgage within the time periods prescribed under Section 12.6(b)(i);

(3) if Leasehold Lender (or its designee) shall acquire Sublessee's interest in this Secondary Sublease and/or the Sublease Property, Leasehold Lender (or its designee) shall, without prejudice to Section 12.6(e), (A) commence to cure and continue diligently to cure all non-payment defaults that are susceptible to being cured by Leasehold Lender with commercially reasonable diligence, (B) cure any payment default in respect of any

portion of Rent, Impositions or any other charges due hereunder and (C) perform and observe all other agreements, covenants and conditions which are to be performed or observed by Sublessee under this Secondary Sublease after the date of such acquisition; and

(4) if any third party shall, by foreclosure or *dation en paiement* under the Leasehold Mortgage or by assignment or other transfer from Leasehold Lender, acquire Sublessee's interest in and to the Sublease Property under this Secondary Sublease, such third party shall, without prejudice to Section 12.6(e), (A) commence to cure and continue diligently to cure all non-payment defaults that are susceptible to being cured by a third party with commercially reasonable diligence, (B) cure any payment default in respect of any portion of Rent, Impositions or other charges due hereunder and (C) perform and observe all other agreements, covenants and conditions which are to be performed or observed by Sublessee under this Secondary Sublease after the date of such acquisition.

However, if Sublessee is in default beyond applicable notice and cure periods under this Secondary Sublease and Leasehold Lender fails to act under Section 12.6(b) above within the applicable time periods set forth in Section 12.6(b)(i), then notwithstanding any provision in this Section 12.6 to the contrary, Sublessor may exercise any right to terminate this Secondary Sublease that Sublessor may have.

(c) *No Modification Without Leasehold Lender's Consent.* Neither Sublessor nor Sublessee will amend, modify, cancel or surrender this Secondary Sublease without Leasehold Lender's prior written consent, and any such action taken without Leasehold Lender's consent shall not be binding on Sublessee or Leasehold Lender or their respective successors and assigns (and this Secondary Sublease shall be interpreted as if such action was not taken), provided, however, that if Sublessee is in default beyond applicable notice and cure periods under this Secondary Sublease and Leasehold Lender fails to act under Section 12.6(b) above within the applicable time periods set forth in Section 12.6(b), then Leasehold Lender's prior written consent shall not be required for Sublessor to exercise any right to terminate this Secondary Sublease that Sublessor may have under Section 12 above.

(d) *Delivery of Notices.* Sublessor shall simultaneously deliver to Leasehold Lender copies of all notices, statements, information and communications delivered or required to be delivered to Sublessee pursuant to this Secondary Sublease, including, without limitation, any notice of any default by Sublessee. In addition, Sublessor shall promptly notify Leasehold Lender in writing of any failure by Sublessee to perform any of Sublessee's obligations under this Secondary Sublease. No notice, statement, information or communication given by Sublessor to Sublessee shall be binding or affect Sublessee or Leasehold Lender or their respective successors and assigns unless a copy of the same shall have simultaneously been delivered to Leasehold Lender in accordance with this Section 12.6(d). All notices to Leasehold Lender shall be addressed to any Leasehold Lender at any address that such Leasehold Lender shall provide in writing to Sublessor and Sublessee, and shall be delivered in a manner permitted under this Secondary Sublease. Notwithstanding anything to the contrary in this Secondary Sublease, Sublessor shall not exercise any remedies related to Sublessee's default hereunder until (x) Sublessor has delivered notice of such default to Leasehold Lender pursuant to this Section 12.6(d) and (y) all applicable cure commencement periods following the delivery of such notice have expired.

(e) Leasehold Lender Not Obligated Under Lease; Permitted Transfers. The granting of the Leasehold Mortgage shall not be deemed to constitute an assignment or transfer of this Secondary Sublease or the Sublease Property to Leasehold Lender, nor shall Leasehold Lender, in its capacity as the holder of the Leasehold Mortgage, be deemed to be an assignee or transferee of this Secondary Sublease or of Sublessee's interests in the Sublease Property thereby created so as to require Leasehold Lender, as such, to assume the performance of any of the terms, covenants or conditions on the part of Sublessee to be performed thereunder. In no event shall any act or omission of Leasehold Lender (including, without limitation, the acquisition of Sublessee's interest in this Secondary Sublease and the Sublease Property created thereby in a transaction described in this Section 12.6 or the taking of possession of the Sublease Property or improvements thereon through a receiver or other means) require Leasehold Lender to assume, or cause Leasehold Lender to be deemed to have assumed, any obligation or liability of Sublessee under this Secondary Sublease, and Leasehold Lender shall have no personal liability to Sublessor for Sublessee's failure to so perform and observe any agreement, covenant or condition of Sublessee under this Secondary Sublease, it being expressly understood and agreed that, in the event of any such failure of Sublessee to perform, Sublessor's sole and exclusive remedy with respect to Leasehold Lender shall be to terminate this Secondary Sublease without any recourse or claim for damages against Leasehold Lender, provided that this Section 12.6(e) shall not relieve Leasehold Lender of the requirements under Section 12.6(b)(ii)(3) in the event that Leasehold Lender has elected to acquire Sublessee's interests in this Secondary Sublease and/or the Sublease Property.

(f) Permitted Transfers. Notwithstanding the provisions of Section 12.6(e), but for the avoidance of doubt while reserving Sublessor's right to terminate this Secondary Sublease pursuant to Section 12.6(b), the purchaser at any sale of this Secondary Sublease and the interests in and to the Sublease Property thereby created in any proceedings for the foreclosure of the Leasehold Mortgage (including, without limitation, power of sale), or the assignee or transferee of this Secondary Sublease and the interests in and to the Sublease Property thereby created under any instrument of assignment or transfer in lieu of the foreclosure (whether to Leasehold Lender or any third party) shall be deemed to be a permitted assignee or transferee under this Secondary Sublease without the need to obtain Sublessor's consent and Sublessor shall recognize such assignee or transferee as the successor-in-interest to Sublessee for all purposes under this Secondary Sublease, and such purchaser, assignee or transferee shall be deemed to have agreed to perform all of the terms, covenants and conditions on the part of Sublessee to be performed under this Secondary Sublease from and after the date of such purchase and/or assignment, but only for so long as such purchaser or assignee is the owner of the Sublessee's interest in, to and under this Secondary Sublease and the Sublessee's interests in and to the Sublease Property thereby created.

(g) New Direct Lease.

(i) If this Secondary Sublease is canceled or terminated for any reason (except in connection with a Bankruptcy Proceeding, for which the provisions of Section 12.6(h) below are hereby agreed upon by Sublessor and Sublessee), and provided that Leasehold Lender has (A) commenced to cure and continues diligently to cure all non-payment defaults that are susceptible to being cured by Leasehold Lender with commercially reasonable diligence, and (B) cured any payment default in respect of any portion of Rent, Impositions or

other charges due hereunder, Sublessor hereby agrees that Sublessor shall, upon Leasehold Lender's written election within one hundred twenty (120) calendar days of such cancellation or termination, promptly enter in a new, direct lease with Leasehold Lender (or its nominee or any other party which Leasehold Lender may designate, including without limitation, Sublessee) with respect to the Leased Premises on the same terms and conditions as this Secondary Sublease (a "New Lease"), it being the intention of the parties to preserve this Secondary Sublease and the interests in and to the Sublease Property created by this Secondary Sublease for the benefit of Leasehold Lender without interruption. Said New Lease shall be superior to all rights, liens and interests intervening between the date of this Secondary Sublease and the granting of the New Lease and shall be free of any and all rights of Sublessee under this Secondary Sublease.

(ii) Sublessee and Sublessor acknowledge and agree that Leasehold Lender shall have the right to encumber such direct New Lease and the estate created thereby with a deed of trust or a mortgage (as the case may be) on the same terms and with the same lien priority as the Leasehold Mortgage, it being the intention of the parties to preserve the priority of the Leasehold Mortgage, this Secondary Sublease and the interests in and to the Sublease Property created by this Secondary Sublease for the benefit of Leasehold Lender without interruption. If this Secondary Sublease is rejected, cancelled or terminated for any reason and Leasehold Lender, its nominee or a designee of Leasehold Lender enters into a direct New Lease with Sublessor with respect to the Sublease Property, Sublessor hereby agrees that it will execute such documents as Leasehold Lender may require in order to ensure that the new direct lease provides for customary leasehold mortgagee protections, including without limitation, protections similar to those contained herein.

(h) Bankruptcy. In the event of a proceeding under the United States Bankruptcy Code (Title 11 U.S.C.) as now or hereafter in effect (a "Bankruptcy Proceeding"):

(i) If this Secondary Sublease is rejected in connection with a Bankruptcy Proceeding by Sublessee or a trustee in bankruptcy (or other party to such proceeding) for Sublessee, such rejection shall be deemed an assignment by Sublessee to the Leasehold Lender of the Sublease Property and all of Sublessee's interest under this Secondary Sublease, and this Secondary Sublease shall not terminate and the Leasehold Lender shall have all rights and obligations of the Sublessee as if such Bankruptcy Proceeding had not occurred, unless Leasehold Lender shall reject such deemed assignment by notice in writing to Sublessor within thirty (30) calendar days following rejection of this Secondary Sublease by Sublessee or Sublessee's trustee in bankruptcy. If any court of competent jurisdiction shall determine that this Secondary Sublease shall have been terminated notwithstanding the terms of the preceding sentence as a result of rejection by Sublessee or the trustee in connection with any such proceeding, the rights of Leasehold Lender to a New Lease from Sublessor pursuant to Section 12.6(i) hereof shall not be affected thereby.

(ii) In the event of a Bankruptcy Proceeding against Sublessor:

(1) If the bankruptcy trustee, Sublessor (as debtor-in-possession) or any party to such Bankruptcy Proceeding seeks to reject this Secondary Sublease pursuant to United States Bankruptcy Code §365(h)(1), Sublessee shall not have the right to treat this Secondary Sublease as terminated except with the prior written consent of Leasehold Lender

and the right to treat this Secondary Sublease as terminated in such event shall be deemed assigned to Leasehold Lender, whether or not specifically set forth in the Leasehold Mortgage, so that the concurrence in writing of Sublessee and the Leasehold Lender shall be required as a condition to treating this Secondary Sublease as terminated in connection with such Bankruptcy Proceeding.

(2) Unless this Secondary Sublease is treated as terminated in accordance with Section 12.6(j)(ii)(1) above, then this Secondary Sublease shall continue in effect upon all the terms and conditions set forth herein, including Rent, but excluding requirements that are not then applicable or pertinent to the remainder of the term of this Secondary Sublease. Thereafter, Sublessee or its successors and assigns shall be entitled to any offsets against Rent payable hereunder for any damages arising from such bankruptcy, to the extent Sublessee's operation of business has been materially interfered with, and any such offset properly made shall not be deemed a default under this Secondary Sublease. The lien of the Leasehold Mortgage shall extend to the continuing possessory rights of Sublessee following such rejection with the same priority as it would have enjoyed had such rejection not taken place.

(i) Estoppel Certificates.

(i) Upon Leasehold Lender's or Sublessee's written request, Sublessor shall provide Leasehold Lender or Sublessee with an estoppel certificate which shall certify to such requesting Leasehold Lender or Sublessee (1) as to the amount and status of all Rent payments and security deposits, if any, under this Secondary Sublease, (2) as to the non-satisfaction or non-compliance by Sublessee of any other conditions under this Secondary Sublease, or alternatively, as to the full satisfaction and compliance by Sublessee of any other conditions required under this Secondary Sublease, (3) as to any existing default of Sublessee under the Secondary Sublease, or alternatively that Sublessee is not in default in the payment, performance or observance of any other condition or covenant to be performed or observed by Sublessee thereunder, (4) setting forth any offsets or counterclaims on the part of Sublessor or alternatively that there are no offsets or counterclaims on the part of Sublessor, and (5) as to such other matters related to this Secondary Sublease as Leasehold Lender may reasonably determine from time to time.

(ii) Upon Leasehold Lender's or Sublessor's written request, Sublessee shall provide Leasehold Lender with an estoppel certificate which shall certify to such requesting Leasehold Lender (1) as to the amount and status of all Rent payments and security deposits under this Secondary Sublease, (2) as to the non-satisfaction or non-compliance by Sublessor of any other conditions under this Secondary Sublease, or alternatively, as to the full satisfaction and compliance by Sublessor of any other conditions required under this Secondary Sublease, (3) as to any existing default of Sublessor under the Sublease, or alternatively that Sublessor is not in default in the payment, performance or observance of any other condition or covenant to be performed or observed by Sublessor thereunder, (4) setting forth any offsets or counterclaims on the part of Sublessor or alternatively that there are no offsets or counterclaims on the part of Sublessee, and (5) as to such other matters related to this Secondary Sublease as such Leasehold Lender may reasonably determine from time to time.

(j) No Merger. There shall be no merger of this Secondary Sublease or any interest in this Secondary Sublease or of the interests in and to the Sublease Property created thereby with the fee estate in the Sublease Property, by reason of the fact that this Secondary Sublease or such interest therein, may be directly or indirectly held by or for the account of any person who shall hold any interest in the fee estate in the Sublease Property, nor shall there be such a merger by reason of the fact that all or any part of the interests in and to the Sublease Property created by this Secondary Sublease may be conveyed or mortgaged in a leasehold mortgage, deed of trust, deed to secure debt or other equivalent instrument (as the case may be) to a mortgagee or beneficiary who shall hold any interest in the fee estate in the Sublease Property or any interest of Sublessor under this Secondary Sublease.

(k) Sublessor's Recognition of Sublessee. Sublessor hereby recognizes Sublessee as the current tenant party to this Secondary Sublease and acknowledges and agrees that Sublessee acquired its interest in this Secondary Sublease and in and to the Sublease Property in accordance with the terms of this Secondary Sublease.

(l) Agreement to Amend. Sublessor recognizes the importance of Sublessee's ability to obtain Leasehold Mortgages, and that the provisions of this Secondary Sublease may be subject to the approval of a Leasehold Lender. If any Leasehold Lender should require, as a condition to such financing, any reasonable modifications of this Secondary Sublease, whether for purposes of clarifying the provisions of this Secondary Sublease or to include provisions then customary for leasehold financing transactions, Sublessor agrees to execute the appropriate amendments to this Secondary Sublease; provided, however, that no such modification shall, to the detriment of Sublessor, impair any of Sublessor's rights, as reasonably determined by Sublessor or increase any of Sublessor's obligations, as reasonably determined by Sublessor, under this Secondary Sublease.

(m) Third-Party Beneficiary. Notwithstanding anything to the contrary in this Secondary Sublease, each Leasehold Lender shall be a third-party beneficiary solely and exclusively with respect to the provisions of this Section 12.6. There are no other third-party beneficiaries to this Secondary Sublease.

(n) Subordination of Sublessor's Lien. Sublessor hereby subordinates any lien or privilege it may have on any movables found from time to time in or upon the Sublease Property, including without limitation, Sublessor's privileges pursuant to La. Civil Code Articles 2707, *et seq.*, to any Leasehold Lender's rights under this Section 12.6 and the lien of any Leasehold Mortgage.

(o) No Waiver. Neither acceptance of Rent by Sublessor nor failure by Sublessor to complain of any action, non-action or default of Sublessee, whether singular or repetitive, shall constitute a waiver of any of Sublessor's rights hereunder. Waiver by Sublessor of any right pertaining to any default of Sublessee shall not constitute a waiver of any right for either a subsequent default of the same obligation or any other default. No act or thing done by Sublessor or Sublessor's agents shall be deemed to be acceptance of surrender of the Sublease Property and no agreement to accept a surrender of the Sublease Property shall be valid unless it is in writing and signed by Sublessor.

13. Entry on Sublease Property.

Sublessor, District and/or Trunkline may request entry into the Sublease Property during normal business hours by delivery of a written request to Sublessee a reasonable time (but in any event not less than twenty-four (24) hours) prior to the requested entry, and Sublessee shall not unreasonably withhold its approval of such request, provided, however, that any entry into the Sublease Property by Sublessor, District, Trunkline and/or their respective employees or agents shall be subject to Sublessee's rules and security procedures and all applicable laws, permits and regulations.

14. Restriction on Assignments and Transfers.

14.1 The Sublessee shall not assign this Secondary Sublease, in whole or in part, or sublet all or any portion of the Sublease Property, without the written consent of the Sublessor, which consent Sublessor will not unreasonably withhold, condition or delay, provided Sublessee is not in default beyond applicable periods of notice and/or cure under this Secondary Sublease. Unless specifically agreed and consented to by Sublessor, no such subleasing or assignment shall relieve Sublessee of Sublessee's obligations hereunder. In the event that Sublessee enters into such sublease or assignment, at the request of the sublessee or assignee, Sublessor shall enter into a direct agreement with such sublessee, (a) providing that if this Secondary Sublease is cancelled or terminated, Sublessor shall enter into a direct New Lease with such sublessee for the balance of the term of this Secondary Sublease and otherwise on substantially the same terms and conditions of this Secondary Sublease, and (b) containing lender provisions substantially similar to those set forth in Section 12.6.

14.2 Notwithstanding the foregoing, Sublessee shall have the right without the requirement of consent by Sublessor, to assign Sublessee's rights, title and interest in, to and under this Secondary Sublease to (a) any Affiliate (as defined below) of Sublessee, (b) any transferee or grantee of all or substantially all of the assets of Sublessee or ownership interests (whether stock, shares or membership interests) in Sublessee, (c) any entity resulting from a merger, non-bankruptcy reorganization or consolidation with Sublessee, (d) to any entity owned by an Affiliate or Affiliates of one or more of the ultimate parent entities that own direct or indirect interests in Sublessee or (e) a Leasehold Lender or any purchaser upon a foreclosure of a Leasehold Mortgage or transferee upon a transfer in lieu of foreclosure (dation en paiement) pursuant to a Leasehold Mortgage; provided, in each case, that such assignment shall not be a subterfuge by Sublessee to avoid its obligations under this Secondary Sublease, and upon such assignment, Sublessee shall not be released from liability under this Secondary Sublease without Sublessor's written consent. The term "Affiliate" shall mean (i) Sublessee's parent company or any wholly owned subsidiary of Sublessee's parent company, or (ii) any entity Controlling, under common Control or Controlled by Sublessee or Sublessee's parent company. The term "Control" shall mean (A) with respect to a corporation, the right to exercise, directly or indirectly, more than fifty percent (50%) of the voting rights attributable to the stock or shares of the controlled corporation, and (B) with respect to an individual or entity that is not a corporation, the possession, directly or indirectly, of the power to direct or cause the direction of the management or policies of the controlled individual or entity.

15. [Reserved]

16. Events of Default of Sublessee.

If any one or more of the following events shall happen and not be remedied as herein provided, an Event of Default shall be deemed to have occurred:

16.1 Breach of Covenant. If (i) Sublessee fails to make a timely payment of Rent, Impositions or any other amount due hereunder and such failure continues for a period of ten (10) days after receipt of notice that such rental or other charges are due, or (ii) Sublessee defaults in the performance of or compliance with any of the covenants, agreements, terms, or conditions contained in this Secondary Sublease (other than the payment of Rent, Impositions or any other amount due hereunder) for a period of thirty (30) days after receipt of written notice thereof from Sublessor specifying the nature of any such default and the acts required to cure same, or (iii) in the case of a default or a contingency which cannot with due diligence be cured within such period of thirty (30) days, the Sublessee fails to proceed with all due diligence within such period of thirty (30) days, to commence cure of the same and thereafter to prosecute the curing of such default with all due diligence (it being intended that in connection with a default not susceptible of being cured with due diligence within thirty (30) days that the time of the Sublessee within which to cure same shall be extended for such period as may be necessary to complete the same with all due diligence), Sublessee shall be *ipso facto* in default of this Secondary Sublease.

16.2 Sublessor's Remedies; Cure.

(a) Right to Terminate. Upon the occurrence of an Event of Default and subject to Section 12.6, Sublessor may terminate this Secondary Sublease by giving written notice to the Sublessee. This Secondary Sublease shall be deemed to expire and terminate on the date that Sublessor specifies in such notice, except that Sublessee waives his right to notice, and this Secondary Sublease, the term hereby demised, and the rights of the Sublessee under this Secondary Sublease shall expire and terminate immediately.

(b) Waiver of Notice. Upon termination of the right of occupancy for any reason, Sublessee hereby expressly waives notice to vacate the premises prior to institution of eviction proceedings in accordance with La.C.C.P. Art. 4701.

(c) Right to Cure. Upon the occurrence of an Event of Default, the Sublessor may take whatever actions are reasonably necessary to cure such Event of Default, including the hiring of attorneys, contractors, consultants, architects, engineers, laborers, or others, purchasing the required goods or services and procuring necessary insurance or performance bonds. The Sublessee shall be responsible for all costs, including attorney's fees and the fees of other professionals, reasonably incurred by the Sublessor pursuant to this Section and such costs shall be billed to the Sublessee in addition to any and all rent due hereunder. The Sublessee shall pay all such additional costs and charges within fifteen (15) days after billing by the Sublessor.

(d) Injunctions and Damages. Upon the occurrence of any Event of Default hereunder, the Sublessor at any time thereafter shall have the right to enjoin such breach and to invoke any right and remedy allowed herein, by law or in equity (except for the right of specific performance), or by statute or otherwise including, without limitation, remedies at law

for damages and for reimbursement of expenses to the Sublessor in connection with any such action, including reasonable attorney's fees, costs, and appellate expenses.

16.3 Taking of Possession; Acceleration of Rent. Upon any expiration or termination of this Secondary Sublease or any termination by summary proceedings or otherwise and subject at all times to Section 12.6, (a) the Sublessee shall quietly and peacefully surrender the Sublease Property to the Sublessor, without any payment therefor by the Sublessor, and the Sublessor, upon or at any time after any such expiration or termination, may without further notice, enter upon and reenter the Sublease Property, by summary proceedings, ejectment, or otherwise, and may dispossess the Sublessee and remove the Sublessee and all other persons and property, including any Equipment, from, in, and around the Sublease Property and may have, hold, and enjoy the Sublease Property and the right to receive all rental income of and from the same; and (b) the Sublessor shall be entitled to collect forthwith upon such termination as liquidated damages, an amount equal to the then outstanding Rent; and (c) all obligations of the Sublessee hereunder for additional rent, or Impositions, or any portion thereof arising or accruing with respect to any period prior to such termination and any obligations of the Sublessee under the indemnification provisions hereof arising or accruing with respect to any period prior to such termination hereof, in each case without regard to whether such matter is first noticed to the Sublessor prior to or subsequent to such termination, shall survive the termination hereof.

16.4 Agent for Service. The Sublessee shall maintain a registered agent of the Sublessee for service of process, which agent will be located within the State of Louisiana. The Sublessee shall provide the name and address of such agent or any successor agent to the Sublessor in writing prior to the commencement of the Secondary Sublease term. If the Sublessee shall fail to maintain such a registered agent within the State of Louisiana, service of process may be accomplished by public posting on the Sublease Property in the same manner and for the same period as provided in Louisiana statutes, with written notice becoming effective at the time of posting.

17. Events of Default of the Sublessor.

17.1 Sublessor's Event of Default. Any failure of the Sublessor to comply with any of its obligations under this Secondary Sublease shall constitute a "Sublessor's Event of Default" hereunder if such failure continues for forty-five (45) days after the Sublessee gives the Sublessor written notice thereof and the acts required to cure the same.

17.2 Sublessee's Remedies. In the event of any Sublessor's Event of Default under this Secondary Sublease, the Sublessee shall have the right to invoke any remedy allowed by law, including, without limitation, termination of this Secondary Sublease by written notice to the Sublessor.

17.3 Expenses Incurred by Sublessee. If Sublessee shall at its option (and without obligation) cure any defaults of Sublessor under or with respect to the Primary Sublease, then Sublessor shall reimburse Sublessee for all costs and expenses incurred by Sublessee in connection with such cure, and shall be paid by the Sublessor to the Sublessee within fifteen (15) days of written demand therefor.

18. Mutual Obligations.

18.1 Late Charges: Interest. If any Rent, Imposition or other sum due hereunder is not paid when due under this Secondary Sublease, and if such delinquency continues for a period of ten (10) days after written notice from the Sublessor to Sublessee, such sum shall bear a late charge equal to twelve percent (12%) of the amount thereof, the parties recognizing and agreeing that such charge represents a reasonable approximation of the additional administrative costs and expenses which are likely to be incurred by the non-defaulting party. Additionally, and except where otherwise provided herein, any sum not paid within twenty (20) days after its due date and any judgment rendered therefor shall bear interest after said twentieth (20th) day to the date of collection at the rate of twelve percent (12%) per annum.

18.2 Obligations to Mitigate Damages. Both the Sublessor and the Sublessee shall have the obligation to take reasonable steps to mitigate their damages caused by any default under this Secondary Sublease.

18.3 Failure to Enforce Not a Waiver. No failure by either party to insist upon the strict performance of any covenant, agreement, term, or condition of this Secondary Sublease or to exercise any right or remedy arising upon the breach thereof; and no acceptance by the Sublessor of full or partial rent during the continuance of any such breach, shall constitute a waiver of any such breach of such covenant, agreement, term, or condition. No covenant, agreement, term, or condition of this Secondary Sublease to be performed or complied with by either party and no breach thereof shall be waived, altered, or modified except by a written instrument executed by both parties. No waiver of any breach shall affect or alter this Secondary Sublease, but each and every covenant, agreement, term, or condition of this Secondary Sublease shall continue in full force and effect with respect to any other then existing or subsequent breach hereof.

18.4 Rights Cumulative. Each right and remedy of the parties provided in this Secondary Sublease shall be cumulative and shall be in addition to every other right or remedy provided for in this Secondary Sublease or now or thereafter existing at law or in equity or by statute or otherwise (excluding, however, specific performance against the Sublessee) and the exercise or beginning of the exercise by the parties of any one or more of such rights or remedies provided for in this Secondary Sublease or now or hereafter existing at law or in equity or by statute or otherwise shall not preclude the simultaneous or later exercise by the parties of any or all other such rights or remedies provided for in this Secondary Sublease or now or hereafter existing at law or in equity or by statute or otherwise.

19. Notices.

19.1 Addresses. All notices required or allowed by this Secondary Sublease shall be delivered by email (with a requirement that such electronic notice shall be followed within three (3) calendar days by written notice delivered in one of other manners permitted in this paragraph), third party overnight courier (including overnight courier services such as Federal Express) or by certified mail, return receipt requested, postage prepaid, addressed to the party to whom notice is to be given, at the following addresses:

If to MAGNOLIA:

Magnolia LNG, LLC

616 Broad Street
P.O. Box 3759 (70602)
Lake Charles, LA 70601
Attention: Company Secretary
Email: dgardner@lnglimited.com.au

with a copy to:

Winfield E. Little, Jr.
616 Broad Street
P.O. Box 3759 (70602)
Lake Charles, LA 70601
Email: wlittle@littlelawfirm.com

and

Chad Mills
Sutherland Asbill & Brennan LLP
1001 Fannin Street, Suite 3700
Houston, TX 77002-6760
Email: chad.mills@sutherland.com

If to BG:

BG LNG Services, LLC
811 Main Street, Suite 3400
Houston, TX 77002
Attention: Marc Hopkins or Marine Operations
Email: mark.hopkins@bg-group.com
shipping.operations@bg-group.com

19.2 Notice shall be deemed to have been given upon receipt by recipient (provided that any notice by email shall have been followed within three (3) calendar days by written notice delivered in one of the other manners permitted under this paragraph), by the overnight courier airbill or by the return receipt. In the event that the recipient fails or refuses to sign the return receipt for delivery by certified mail, the receipt shall be sufficient.

20. Quiet Enjoyment; Title; Further Assurances.

20.1 Quiet Enjoyment. Subject to the terms and conditions of this Secondary Sublease, the Sublessee, upon paying the Rent and all additional rent, Impositions, and other charges herein provided for and observing and keeping all covenants, agreements, and conditions of this Secondary Sublease on its part to be kept and performed in all material respects, shall quietly have and enjoy the Sublease Property during the term of this Secondary Sublease, without hindrance or molestation by the Sublessor or anyone claiming under or through the Sublessor. This agreement shall be construed as a covenant running with the land. Further and notwithstanding anything else contained in this Section 20.1 or elsewhere in this Secondary Sublease, Sublessee acknowledges that (a) Sublessor and Trunkline are or will be utilizing property adjacent to the Sublease Property and in the vicinity of the Sublease Property, for (i) a similar project and uses similar to the Specified Use and (ii) for terminalling services, activities and operations (collectively, the "Sublessor/Trunkline Uses"); (b) Sublessor and/or Trunkline may, and specifically reserve the right to, object or take such other legal actions against Sublessee with respect to Sublessee's activities and operations on the Sublease Property or on

property adjacent to or in the vicinity of the Sublease Property on the basis that such Sublessee activities and/or operations are unreasonably interfering (or will unreasonably interfere) with the Sublessor/Trunkline Uses; (c) any such objections or other legal actions so taken by Trunkline or Sublessor shall not constitute (i) a breach by Trunkline or Sublessor of this Section 20.1 or any other provision of this Secondary Sublease or (ii) a disturbance of Sublessee's possession of the Sublease Property; and (d) any such objection(s) or legal actions taken by Trunkline or Sublessor shall not entitle Sublessee to any abatement of or reduction in Rent or other charges due by Sublessee under this Secondary Sublease.

20.2 Sublessor's Title. Except as otherwise provided herein, Sublessor represents and warrants as a condition of this Secondary Sublease that the Primary Sublease is valid and in effect and that Sublessor has the right thereunder to make this Secondary Sublease for the term hereof. Except as set forth in this Section 20.2 or elsewhere in this Secondary Sublease, this Secondary Sublease is made without warranty of title or possession either express or implied. This Secondary Sublease, as it applies to the Sublease Property, is subject to all matters of record as of the Commencement Date with respect to the Sublease Property.

20.3 Further Assurances. Notwithstanding anything to the contrary contained in this Secondary Sublease, the Sublessor and the Sublessee agree that they shall in good faith undertake to perform their covenants, agreements and obligations in this Secondary Sublease, to satisfy all conditions and to cause the transaction contemplated by the purposes of this Secondary Sublease to be carried out promptly in accordance with the terms hereof. Each party shall do such things as may be reasonably requested by the other party, at the expense of the requesting party, in order to accomplish more effectively the purposes and other agreements contemplated by this Secondary Sublease.

21. Casualty; Eminent Domain.

21.1 Casualty. This Secondary Sublease shall not terminate or be cancelled at any time upon the damage or destruction by fire or other casualty of all, substantially all, or any part of the Sublease Property or the Sublessee's Improvements. Sublessee shall have full use of and the right to apply its insurance proceeds available for rebuilding and restoration of Sublessee Improvements.

21.2 Condemnation or Expropriation. If the whole of the Sublease Property shall be taken under power of eminent domain or expropriation by any public or private authority, then this Secondary Sublease and the applicable term hereof shall cease and terminate as of the date of such taking. If only a portion of the Sublease Property shall be taken, and such partial taking shall result in the inability of Sublessee to operate its Sublessee Improvements, or have a material adverse effect upon Sublessee's operation of its Sublessee Improvements, on the remainder of the Sublease Property, then Sublessee may, at its election, terminate this Secondary Sublease by giving Sublessor notice of the exercise of Sublessee's election within one hundred twenty (120) calendar days after Sublessee shall receive notice of such taking. In the event of termination under this Section 21, and any unearned Rent or other charges, if any, paid in advance, shall be refunded to Sublessee, and this Secondary Sublease shall cease and terminate as of the date of such taking, subject, however, to the right of Sublessee, at its election, (i) to continue to occupy the Sublease Property, subject to the terms and provisions of this Secondary

Sublease, for all or such part, as Sublessee may determine, of the period between the date of such taking and the date when possession of the Sublease Property shall be taken by the public authority; and (ii) to keep this Secondary Sublease in full force and effect so as to obtain the highest possible award from the condemning authority, if termination of this Secondary Sublease would reduce any award for a taking, as set forth herein below in this Section 21.1. In the event of a taking of a portion of the Sublease Property and this Secondary Sublease is not terminated, then Base Rent shall be reduced pro rata based upon the portion of the Sublease Property taken. The parties reserve any rights each may have under applicable law to seek from the expropriating authority an award for a taking of their respective interests in, under and to the Sublease Property and this Secondary Sublease. All compensation awarded for any taking of the Sublease Property shall belong to the party to whom such award was made. If only one award is made as to the Sublease Property, such award shall be allocated between Sublessor and Sublessee in accordance with their respective interests. Notwithstanding the foregoing, any award attributable or applicable to any improvements on the Sublease Property shall belong to Sublessee. Sublessor agrees that, to the extent permitted by law, Sublessor waives and forebears the use of any of its power of expropriation that would impair Sublessee's interest in, under and to this Secondary Sublease or the performance of this Secondary Sublease.

22. Force Majeure. In the event that Sublessee shall be delayed or hindered in or prevented from the performance of any act required hereunder (other than payment of Rent, Impositions or other charges) by reason of any event that is outside the reasonable control of Sublessee, including, but not limited to, strikes, lock-outs, labor troubles, inability to procure materials, failure of power, restrictive governmental laws or regulations, changes in governmental laws or regulations, delay in obtaining permits beyond the time periods for obtaining permits that existed as of the Commencement Date (provided that such delay did not result from failure of Sublessee to comply with the clear requirements of the permitting office), riots, insurrection, civil unrest, war, terrorist act, act of a public enemy, sabotage, blockade, embargo, hurricane, fire, flood, tornado, earthquake, storm, lightning, washout, explosion, or other reason of a like nature not the fault of the party delayed in performing work or doing acts required under the terms of this Secondary Sublease ("Force Majeure Event"), then performance of such act shall be excused temporarily but shall accrue during the period of the delay and the period for the performance of any such act shall be extended for a period equivalent to the period of such delay. The provisions of this Section 22 shall not relieve Sublessee of any of its other obligations hereunder nor operate to excuse Sublessee from prompt payment of all Rent, Impositions or other charges. Notwithstanding anything to the contrary contained in this Secondary Sublease, in the event of a Force Majeure Event, the prolonged effects of which prevent the commercially reasonable use of the Sublease Property or the Sublessee Improvements (or the construction or reconstruction of the Sublessee Improvements following a casualty or Force Majeure Event), for more than twelve (12) consecutive months, then Sublessee shall have the right to terminate this Secondary Sublease by giving notice to Sublessor.

23. Miscellaneous.

23.1 Time is of the Essence. Time is of the essence of each and all of the terms and provisions of this Secondary Sublease.

23.2 Access to Premises. The Sublessee agrees to comply with any and all reasonable rules and regulations of the District and Sublessor regarding access to secured areas of the port and regarding the proper identification of all visitors to the Sublease Property, provided that such rules and regulations do not conflict with any requirements imposed upon Sublessee by the Federal Energy Regulatory Commission or any other federal or state agency having jurisdiction over the Sublease Property.

23.3 Successors. The covenants, agreements, terms, provisions, and conditions contained in this Secondary Sublease shall apply to and inure to the benefit of and be binding upon the Sublessor and the Sublessee and their respective successors and assigns, except as expressly otherwise herein provided, and shall be deemed covenants running with the respective interests of the parties hereto.

23.4 Surviving Covenants. Each provision of this Secondary Sublease which may require performance in any respect by or on behalf of either the Sublessee or the Sublessor after the expiration of the term hereof or its earlier termination shall survive such expiration or earlier termination.

23.5 Provisions Deemed Conditions and Covenants. All of the provisions of this Secondary Sublease shall be deemed and construed to be “conditions” and “covenants” as though the words specifically expressing or importing covenants and conditions were used to each separate provision hereof.

23.6 Headings. The headings and section captions in this Secondary Sublease and the Table of Contents are inserted only as a matter of convenience and for reference and in no way define, limit, or describe the scope or intent of this Secondary Sublease or in any way affect this Secondary Sublease as to matters of interpretation or otherwise.

23.7 Entire Agreement; No Oral Change or Termination. This Secondary Sublease and the exhibits appended hereto and incorporated herein by reference contain the entire agreement between the parties hereto with respect to the subject matter hereof and no change, modification, or discharge hereof in whole or in part shall be effective unless such change, modification, or discharge is in writing and signed by the party against whom enforcement of the change, modification, or discharge is sought. This Secondary Sublease is the full and complete agreement applicable between the parties, shall be the controlling agreement between the parties, and cannot be changed or terminated orally.

23.8 Governing Law; Severability. This Secondary Sublease shall be governed by and construed in accordance with the laws of the State of Louisiana. If any term or provision of this Secondary Sublease or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, the remaining provisions of this Secondary Sublease or the application of such term or provision to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected thereby, and each term and provision of this Secondary Sublease shall be valid and enforceable to the fullest extent permitted by law.

23.9 Counterparts. This Secondary Sublease may be executed in one or more counterparts, each of which so executed shall be deemed to be an original and all of which together shall constitute but a single document.

23.10 Arbitration. Any dispute or controversy between the parties arising out of or related to this Secondary Sublease shall, if the parties are unable to resolve such dispute amicably, be finally settled by arbitration between the parties using the Commercial Rules of Arbitration of the American Arbitration Association to be held in Houston, Texas, but the matter need not be submitted to AAA. The arbitration shall be conducted before a panel of three arbitrators, one to be selected by each party, and the third to be selected by the first two. The arbitration award may be enforced by application to any court of competent jurisdiction and the losing party shall pay all reasonable costs and expenses (including reasonable attorneys' fees) of the prevailing party.

23.11 Gender of Words. Words of any gender in this Secondary Sublease shall be held to include masculine or feminine and words denoting a singular number shall be held to include the plural, and plural shall include the singular, whenever the sense requires.

23.12 Authority. The Sublessor represents and warrants that it has the authority to enter into this Secondary Sublease, that, when executed, this Secondary Sublease shall be binding and enforceable in accordance with its terms.

23.13 No Brokers. Neither party to this Secondary Sublease shall be liable for any real estate brokers' or leasing agents' commissions in the absence of a written agreement which expressly provides therefor and which is to be charged.

23.14 Legal Relationships. This Secondary Sublease shall not be interpreted or construed as establishing a partnership or joint venture between the Sublessor and the Sublessee and neither party shall have the right to make any representations or be liable for the debts or obligations of the other. Neither party is executing this Secondary Sublease as an agent for an undisclosed principal. No third party is intended to be benefited by this contract.

23.15 Memorandum of Lease. At either party's request, the parties hereto agree to execute and cause to be properly recorded a memorandum of this Secondary Sublease, sufficient in form and content to give third-parties constructive notice of the Sublessee's interest hereunder.

INTERVENTION BY DISTRICT AND TRUNKLINE

And now into these premises comes LAKE CHARLES HARBOR & TERMINAL DISTRICT ("District") and TRUNKLINE LNG COMPANY, LLC ("Trunkline") which intervene for the purpose of and do hereby consent to the entering into this Secondary Sublease among Sublessor and Sublessee, which further consent and agree to the following:

A. District and Trunkline consent to this Secondary Sublease and to the Specified Use proposed for the Sublease Property. Where approval or consent of District or Trunkline is required under the Primary Sublease (including, for the avoidance of doubt, for uses beyond the

Specified Use), District and Trunkline agree not to unreasonably withhold, delay or condition such approval or consent.

B. Sublessee agrees that it will not sublease the Sublease Property without the approval of District, which approval District agrees shall not be unreasonably withheld, delayed or conditioned.

C. District agrees to waive the provision set forth in Section C of the District's Intervention contained in the Primary Sublease with respect to this Secondary Sublease and any other equivalent provision contained in the documents ancillary to the Primary Sublease.

D. District and Trunkline each acknowledge and agree that the Primary Sublease is in full force and effect.

E. Upon the occurrence of any event that would give District the right to terminate the Prime Lease, or Trunkline the right to terminate the Primary Sublease, as the case may be, or in the event that Trunkline or Sublessor fails to timely exercise any renewal options thereunder, District and/or Trunkline, as applicable, agree to send written notice to Sublessee describing the circumstances giving rise to such right to terminate and what would need to be done by Trunkline or Sublessor to prevent such termination or that the renewal option(s) have not been timely exercised by Sublessor or Trunkline, whichever the case may be (an "Impending Termination Notice"). Any such notice shall contain a conspicuous notice, in bold font and all capitalized letters, noting that Sublessee's response is necessary to prevent the termination of this Secondary Sublease. If the event giving rise to District's and/or Trunkline's right to terminate concerns Trunkline's or Sublessor's failure to pay any undisputed monies due, Sublessee shall have ten (10) days from receipt of the Impending Termination Notice to prevent termination by making payment on Trunkline's or Sublessor's behalf, whichever the case may be. If the event giving rise to District's or Trunkline's right to terminate is something other than Trunkline's or Sublessor's failure to pay an undisputed amount and Sublessee informs District and/or Trunkline within ten (10) days of receipt of the Impending Termination Notice that it plans to use reasonable efforts to cure or remedy such event, then District and/or Trunkline shall suspend its termination right until sixty (60) days after the date that Sublessee receives the Impending Termination Notice, at which time District and/or Trunkline may exercise its right to terminate if the event giving rise to the Impending Termination Notice has not been cured or remedied. If the event giving rise to District's and/or Trunkline's right to terminate concerns Trunkline's or Sublessor's failure to timely exercise its renewal option under the applicable Primary Sublease or Trunkline Restated Lease, the District and/or Trunkline, shall provide the Impending Termination Notice to Sublessee not later than three (3) business days after the date to exercise such renewal option(s) expired and Sublessee shall have thirty (30) days from receipt of such Impending Termination Notice to elect to exercise the applicable renewal option under the applicable lease(s), but only with respect to the Sublease Property and the District and/or Trunkline shall accept such exercise from Sublessee and enter into such further agreements or documents as Sublessee deems necessary to evidence such exercise of the renewal option with respect to the Sublease Property. In the event any such renewal of the Prime Lease or the Primary Sublease shall be impossible due to the failure or refusal of Trunkline or Sublessor to exercise the applicable renewal option(s) under the applicable lease(s), or in the event a Bankruptcy Proceeding against Trunkline or Sublessor prevents or inhibits any such renewal, or if any such Bankruptcy Proceeding results in the rejection, cancellation or termination of this

Secondary Sublease for any reason, the District and Trunkline hereby agree that it shall, upon Sublessee's written election within one hundred twenty (120) calendar days after such cancellation or termination or after determination of Sublessee of such failure or refusal, promptly enter in a new, direct lease with Sublessee with respect to the Sublease Property on the same terms and conditions as this Secondary Sublease, it being the intention of the parties to preserve this Secondary Sublease and the interests in and to the Sublease Property created by this Secondary Sublease for the benefit of Sublessee without interruption.

F. District and Trunkline acknowledge and agree that Trunkline and Sublessor shall have the right to exercise their respective renewal options under the Primary Sublease and/or Restated Trunkline Lease with respect to the Sublease Property only so long as this Secondary Sublease remains in effect.

[Signatures appear on the following page]

IN WITNESS WHEREOF the undersigned parties have executed this Secondary Sublease as of the date first above written.

ATTEST:

By: _____

Name: _____

Title: _____

(SEAL)

ATTEST:

By: _____

Name: _____

Title: _____

(SEAL)

ATTEST:

By: _____

Name: _____

Title: _____

(SEAL)

ATTEST:

By: Todd Cooper

Name: Todd Cooper

Title: AGC

(SEAL)

SUBLESSOR:

BG LNG SERVICES, LLC

By: _____

Name: _____

Title: _____

SUBLESSEE:

MAGNOLIA LNG, LLC

By: _____

Name: _____

Title: _____

INTERVENOR:

LAKE CHARLES HARBOR & TERMINAL DISTRICT

By: _____

Name: _____

Title: _____

INTERVENOR:

TRUNKLINE LNG COMPANY, LLC

By: L.T. Stone

Name: L.T. STONE

Title: Sr. Vice President

Exhibit "A"

(Sublease Property)

Tract 2

THAT CERTAIN TRACT OR PARCEL OF LAND LYING IN THE NORTHWEST QUARTER (NW/4) OF SECTION 16, TOWNSHIP 11 SOUTH RANGE 9 WEST CALCASIEU PARISH, LOUISIANA, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS TO-WIT:

COMMENCING AT THE NORTHEAST CORNER OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, TOWNSHIP 11 SOUTH, RANGE 9 WEST, CALCASIEU PARISH, LOUISIANA;

THENCE SOUTH 00° 38' 59" WEST, ALONG THE EAST LINE OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, FOR A DISTANCE OF 1710.61 FEET;

THENCE NORTH 89° 23' 01" WEST, PERPENDICULAR TO THE EAST LINE OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, FOR A DISTANCE OF 3327.59 FEET, TO A POINT BEING NORTH 00° 21' 53" WEST FROM THE NORTHWEST CORNER OF AN EXISTING WATER FACILITY PLANT, THE SOUTHEAST CORNER AND THE POINT OF BEGINNING OF HEREIN DESCRIBED TRACT;

THENCE NORTH 89° 35' 15" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 141.51 FEET;

THENCE NORTH 76° 41' 29" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 51.15 FEET;

THENCE NORTH 31° 56' 30" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 61.15 FEET;

THENCE NORTH 00° 27' 52" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 224.23 FEET;

THENCE NORTH 00° 05' 52" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 213.55 FEET;

THENCE NORTH 01° 29' 39" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 256.72 FEET;

THENCE NORTH 02° 15' 14" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 100.03 FEET;

THENCE NORTH 82° 51' 44" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 100.00 FEET;

THENCE NORTH 00° 34' 11" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 40.20 FEET;

THENCE NORTH 13° 39' 00" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 102.99 FEET;

THENCE NORTH 22° 49' 51" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 74.59 FEET, TO THE TOP BANK OF THE CALCASIEU RIVER INDUSTRIAL CANAL, THE NORTHWEST CORNER OF THE HEREIN DESCRIBED TRACT;

THENCE MEANDERING ALONG SAID TOP BANK, IN A GENERAL DIRECTION OF SOUTH 81° 59' 48" EAST FOR A DISTANCE OF 99.68 FEET;

THENCE MEANDERING ALONG SAID TOP BANK, IN A GENERAL DIRECTION OF SOUTH 74° 51' 36" EAST FOR A DISTANCE OF 53.10 FEET;

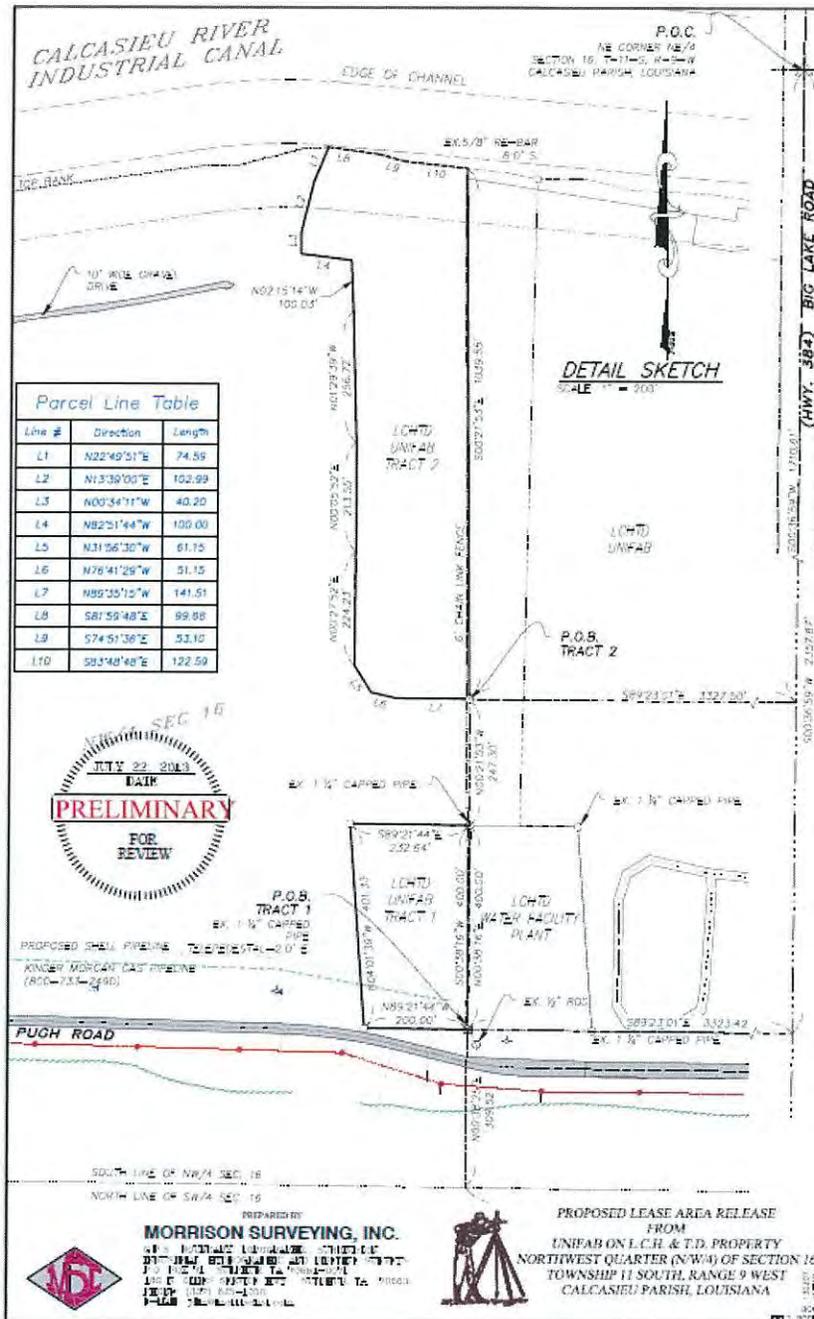
THENCE MEANDERING ALONG SAID TOP BANK, IN A GENERAL DIRECTION OF SOUTH 83° 48' 48" EAST FOR A DISTANCE OF 122.59 FEET;

THENCE SOUTH 00° 21' 53" EAST, FOR A DISTANCE OF 1039.55 FEET TO THE POINT OF BEGINNING.

HEREIN DESCRIBED TRACT CONTAINING 5.74 ACRES, MORE OR LESS.

[Exhibit "A"]

Exhibit "A-1"
(Sublease Property)



Appendix 1.C.3

Amendment to the Port District Option Agreement

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**FIRST AMENDMENT TO
REAL ESTATE LEASE OPTION AGREEMENT**

BE IT KNOWN, that on the dates hereinafter set forth, before the undersigned Notaries Public, duly commissioned and qualified in and for their respective State and County/Parish, and in the presence of the undersigned competent witnesses personally came and appeared:

MAGNOLIA LNG, LLC ("PROJECT COMPANY"), a Delaware limited liability company with its principal business office located at 5 Ord Street, West Perth, Western Australia 6005, and with its registered office in Louisiana at 5615 Corporate Blvd, Suite 400B, Baton Rouge, LA 70808, herein represented by its duly authorized undersigned representative; and

LAKE CHARLES HARBOR & TERMINAL DISTRICT ("DISTRICT"), a political subdivision of the State of Louisiana, herein represented by its duly authorized Executive Director, with its principal business office located in Calcasieu Parish, Louisiana at 751 Bayou Pines East, Suite P, Lake Charles, Louisiana 70601;

which hereinafter collectively declare that:

WITNESSETH:

WHEREAS, the DISTRICT and the PROJECT COMPANY are parties to that certain Real Estate Lease Option Agreement, dated as of March 6, 2013 (the "Option Agreement"), with respect to the "Project Site" as more particularly described on Exhibit 1 to the Option Agreement; and

WHEREAS, the parties desire to amend the Option Agreement in order to more particularly describe the "Project Site" as set forth below.

NOW, THEREFORE, in consideration of the above recitals and the mutual covenants hereinafter contained, the parties herein covenant and agree as follows:

AGREEMENT

1. **RECITALS.** The foregoing recital of facts is hereby incorporated herein to the same extent as if hereinafter fully set forth. Capitalized words and phrases used herein which are not defined herein but which are defined in the Option Agreement shall have the meanings ascribed thereto in the Option Agreement.

2. **PROJECT SITE.** Exhibit 1 to the Option Agreement is hereby deleted in its entirety, and Exhibit 1 attached to this Amendment is substituted in lieu thereof. All references in the Option Agreement and the Ground Lease to Exhibit 1 to the Option Agreement or to the Project Site shall be deemed to refer to the real property described on Exhibit 1 attached to this Amendment.

3. **MISCELLANEOUS.** Except as herein amended, the terms and provisions of the Option Agreement shall remain in full force and effect and unamended. In the event of any conflict between the terms of this Amendment and the terms of the Option Agreement, the terms of this Amendment shall prevail. This Amendment may be executed in multiple counterparts, each of which shall be an original and all of which together shall constitute one and the same agreement. It shall not be necessary that each party execute each counterpart, or that any one counterpart be executed by both parties, so long as each party executes at least one counterpart. This Amendment shall be binding upon and shall inure to the benefit of the parties hereto and their respective successors and assigns and shall be governed by the laws of the State of Louisiana.

[Signatures on Following Pages]

THUS DONE AND SIGNED by the DISTRICT at Lake Charles, Louisiana, in the presence of the undersigned competent witnesses and me, Notary, on this 21ST day of October, 2013.

WITNESSES:

LAKE CHARLES HARBOR &
TERMINAL DISTRICT

Michelle Bolen
Print Name: Michelle Bolen

By: William J. Rase III
William J. Rase, III, Executive Director

Tiffany Fournet
Print Name: Tiffany Fournet

10-18-13
Lee

Approved By:

[Signature]

Michael K. Dees, General Counsel

BEFORE ME: Sharon L. Edwards
Notary Public

My Commission expires:



SHARON L. EDWARDS
NOTARY PUBLIC NO. 6529
STATE OF LOUISIANA
PARISH OF CALCASIEU
MY COMMISSION IS FOR LIFE

THUS DONE AND SIGNED by MAGNOLIA LNG, LLC at Houston, Texas in the presence of the undersigned competent witnesses and me, Notary, on this 28th day of August, 2013.

WITNESSES:

MAGNOLIA LNG, LLC

A. L. VAN
Print Name: A. L. VAN

By: [Signature]
Name: Fletcher Maurice Brand
Title: Managing Director

Gia Vandew
Print Name: Gia Vandew

BEFORE ME: Mary E. Snitkin
Notary Public
My Commission expires: Apr 28, 2016

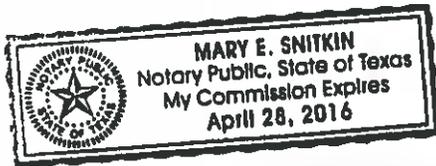


EXHIBIT 1

Legal Description of Project Site

THAT CERTAIN TRACT OR PARCEL OF LAND LYING IN THE NORTHWEST QUARTER (NW/4) OF SECTION 16 AND THE NORTHEAST QUARTER (NE/4) OF SECTION 17, ALL IN TOWNSHIP 11 SOUTH RANGE 9 WEST, CALCASIEU PARISH, LOUISIANA, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS TO-WIT:

COMMENCING AT THE NORTHEAST CORNER OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, TOWNSHIP 11 SOUTH, RANGE 9 WEST, CALCASIEU PARISH, LOUISIANA;

THENCE SOUTH 00° 36' 59" WEST, ALONG THE EAST LINE OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, FOR A DISTANCE OF 2421.41 FEET;

THENCE NORTH 89° 23' 01" WEST, PERPENDICULAR TO THE EAST LINE OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, FOR A DISTANCE OF 3323.02 FEET TO A POINT IN THE CENTER OF HENRY PUGH ROAD, THE POINT OF BEGINNING OF HEREIN DESCRIBED TRACT;

THENCE NORTH 76° 14' 23" WEST, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD, FOR A DISTANCE OF 146.52 FEET TO THE POINT OF CURVATURE OF A TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 1041.43 FEET AND A CENTRAL ANGLE OF 12° 07' 47";

THENCE WESTERLY, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD AND SAID CURVE TO THE LEFT, FOR AN ARC LENGTH DISTANCE OF 220.47 FEET TO THE POINT OF TANGENT OF SAID CURVE;

THENCE NORTH 88° 22' 09" WEST, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD, FOR A DISTANCE OF 1217.96 FEET TO THE POINT OF CURVATURE OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 841.18 FEET AND A CENTRAL ANGLE OF 16° 58' 53";

THENCE NORTHWESTERLY, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD AND SAID CURVE TO THE RIGHT, FOR AN ARC LENGTH DISTANCE OF 249.31 FEET TO THE POINT OF TANGENT OF SAID CURVE;

THENCE NORTH 71° 23' 16" WEST, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD, FOR A DISTANCE OF 178.78 FEET TO THE POINT OF CURVATURE OF A TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 738.61 FEET AND A CENTRAL ANGLE OF 18° 13' 31";

THENCE WESTERLY, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD AND SAID CURVE TO THE LEFT, FOR AN ARC LENGTH DISTANCE OF 234.95 FEET TO THE POINT OF TANGENT OF SAID CURVE;

THENCE NORTH 89° 36' 48" WEST, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD, FOR A DISTANCE OF 296.54 FEET TO THE POINT OF CURVATURE OF A TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 452.23 FEET AND A CENTRAL ANGLE OF 26° 53' 46";

THENCE SOUTHWESTERLY, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD AND SAID CURVE TO THE LEFT, FOR AN ARC LENGTH DISTANCE OF 212.29 FEET TO THE POINT OF TANGENT OF SAID CURVE;

THENCE SOUTH 63° 29' 26" WEST, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD, FOR A DISTANCE OF 119.45 FEET TO THE POINT OF CURVATURE OF A TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 423.73 FEET AND A CENTRAL ANGLE OF 27° 51' 58";

THENCE WESTERLY, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD AND SAID CURVE TO THE RIGHT, FOR AN ARC LENGTH DISTANCE OF 206.08 FEET TO THE POINT OF TANGENT OF SAID CURVE;

THENCE NORTH 88° 38' 36" WEST, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD, FOR A DISTANCE OF 404.62 FEET TO THE POINT OF CURVATURE OF A TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 277.56 FEET AND A CENTRAL ANGLE OF 53° 00' 37";

THENCE NORTHWESTERLY, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD AND SAID CURVE TO THE RIGHT, FOR AN ARC LENGTH DISTANCE OF 256.80 FEET TO THE POINT OF TANGENT OF SAID CURVE;

THENCE NORTH 35° 37' 58" WEST, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD, FOR A DISTANCE OF 383.12 FEET;

THENCE NORTH 55° 04' 12" EAST, ALONG THE SOUTHERLY BOUNDARY LINE AND AN EXTENSION THEREOF OF PROPERTY FORMERLY OR CURRENTLY OWNED BY TALENS MARINE AND FUEL, FOR A DISTANCE OF 232.64 FEET TO AN EXISTING 5/8" ROD;

THENCE NORTH 18° 04' 32" EAST, ALONG SAID BOUNDARY LINE OF THE TALENS MARINE AND FUEL PROPERTY, FOR A DISTANCE OF 141.20 FEET TO AN EXISTING 5/8" ROD;

THENCE NORTH 53° 25' 06" EAST, ALONG SAID BOUNDARY LINE OF THE TALENS MARINE AND FUEL PROPERTY, FOR A DISTANCE OF 148.42 FEET TO AN EXISTING 5/8" ROD;

THENCE NORTH 39° 21' 56" WEST, ALONG THE EASTERLY LINE OF SAID TALENS MARINE AND FUEL PROPERTY, FOR A DISTANCE OF 52.32 FEET, MORE OR LESS, TO THE SOUTH BANK OF CALCASIEU RIVER INDUSTRIAL CANAL;

THENCE MEANDERING ALONG SAID CALCASIEU RIVER INDUSTRIAL CANAL, IN A GENERAL DIRECTION OF NORTH 89° 25' 34" EAST, FOR A DISTANCE OF 1493.33 FEET;

THENCE MEANDERING ALONG SAID CALCASIEU RIVER INDUSTRIAL CANAL, IN A GENERAL DIRECTION OF NORTH 81° 48' 24" EAST, FOR A DISTANCE OF 1758.57 FEET;

THENCE MEANDERING ALONG SAID CALCASIEU RIVER INDUSTRIAL CANAL, IN A GENERAL DIRECTION OF NORTH 78° 24' 29" EAST, FOR A DISTANCE OF 184.31 FEET TO THE NORTHEAST CORNER OF PROPERTY CURRENTLY OR FORMERLY OWNED BY LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.);

THENCE SOUTH 22° 49' 51" WEST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 74.59 FEET;

THENCE SOUTH 13° 39' 00" WEST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 109.99 FEET;

THENCE SOUTH 00° 34' 11" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 40.20 FEET;

THENCE SOUTH 82° 51' 44" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 100.00 FEET;

THENCE SOUTH 02° 15' 14" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 100.03 FEET;

THENCE SOUTH 01° 29' 39" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 256.72 FEET;

THENCE SOUTH 00° 05' 52" WEST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 213.55 FEET;

THENCE SOUTH 00° 27' 52" WEST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 224.23 FEET;

THENCE SOUTH 31° 56' 30" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 61.15 FEET;

THENCE SOUTH 76° 41' 29" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 51.15 FEET;

THENCE SOUTH 89° 35' 15" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 141.51 FEET;

THENCE SOUTH 00° 21' 53" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 247.30 FEET TO AN EXISTING 1 1/4" CAPPED PIPE;

THENCE NORTH 89° 21' 44" WEST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 232.64 FEET;

THENCE SOUTH 04° 01' 39" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 401.33 FEET;

THENCE SOUTH 89° 21' 44" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 200.00 FEET TO AN EXISTING 1 1/4" CAPPED PIPE MARKING THE SOUTHWEST CORNER OF THE LAKE CHARLES HARBOR AND TERMINAL DISTRICT WATER FACILITY PLANT;

THENCE SOUTH 00° 15' 28" WEST, FOR A DISTANCE OF 63.54 FEET TO THE POINT OF BEGINNING.

HEREIN DESCRIBED TRACT IS SUBJECT TO ROAD RIGHTS-OF-WAY ON THE SOUTH AND WEST SIDE THEREOF.

HEREIN DESCRIBED TRACT IS SUBJECT TO THE CALCASIEU RIVER INDUSTRIAL CANAL RIGHT-OF-WAY ON THE NORTH SIDE THEREOF.

HEREIN DESCRIBED TRACT CONTAINING 107.59 ACRES, MORE OR LESS.

TRACT-1

THAT CERTAIN TRACT OR PARCEL OF LAND LYING IN THE NORTH HALF OF SECTION 16, TOWNSHIP 11 SOUTH, RANGE 9 WEST, CALCASIEU PARISH, LOUISIANA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS TO-WIT:

COMMENCING AT THE SOUTHEAST CORNER OF THE NORTHEAST QUARTER (NE/4) OF SECTION 16, TOWNSHIP 11 SOUTH, RANGE 9 WEST, CALCASIEU PARISH, LOUISIANA;

THENCE NORTH 89° 21' 35" WEST, ALONG THE SOUTH LINE OF SAID NORTHEAST QUARTER (NE/4), FOR A DISTANCE OF 3331.06 FEET;

THENCE NORTH 00° 38' 25" EAST, PERPENDICULAR TO SAID SOUTH LINE, FOR A DISTANCE OF 309.52 FEET TO AN EXISTING 1 1/4" CAPPED PIPE ON THE SOUTHWEST CORNER OF AN EXISTING WATER FACILITY PLANT, THE POINT OF BEGINNING AND SOUTHEAST CORNER OF HEREIN DESCRIBED TRACT;

THENCE NORTH 89° 21' 44" WEST, ALONG A WESTERLY EXTENSION OF THE SOUTH LINE OF SAID WATER FACILITY PLANT, FOR A DISTANCE OF 200.00 FEET, THE SOUTHWEST CORNER OF THE HEREIN DESCRIBED TRACT;

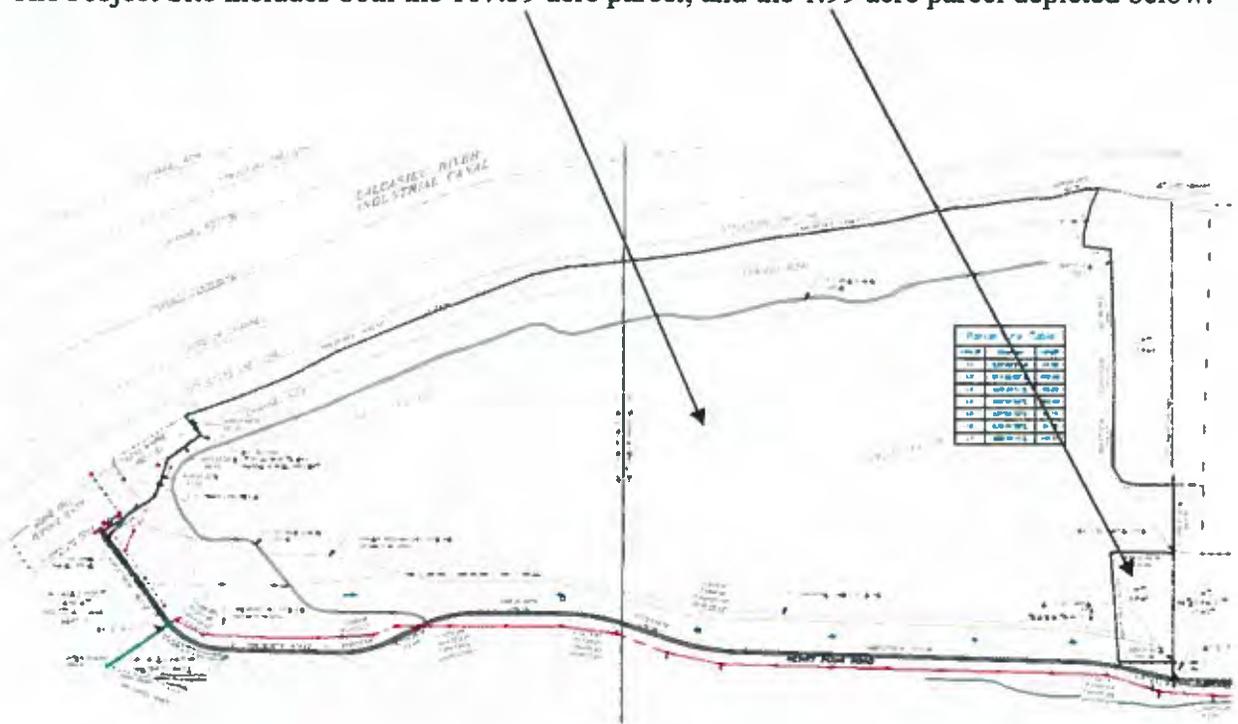
THENCE NORTH 04° 01' 39" WEST, FOR A DISTANCE OF 401.33 FEET TO THE INTERSECTION WITH A WESTERLY EXTENSION OF THE NORTH LINE OF SAID WATER FACILITY PLANT, THE NORTHWEST CORNER OF THE HEREIN DESCRIBED TRACT;

THENCE SOUTH 89° 21' 44" EAST, ALONG SAID EXTENSION, FOR A DISTANCE OF 232.64 FEET TO AN EXISTING 1 1/4" CAPPED PIPE ON THE NORTHWEST CORNER OF SAID WATER FACILITY PLANT, THE NORTHEAST CORNER OF THE HEREIN DESCRIBED TRACT;

THENCE SOUTH 00° 38' 16" WEST, ALONG THE WEST LINE OF THE AFORESAID WATER FACILITY PLANT, FOR A DISTANCE OF 400.00 FEET TO THE POINT OF BEGINNING.

HEREIN DESCRIBED TRACT CONTAINING 1.99 ACRES, MORE OR LESS.

The Project Site includes both the 107.59 acre parcel, and the 1.99 acre parcel depicted below:

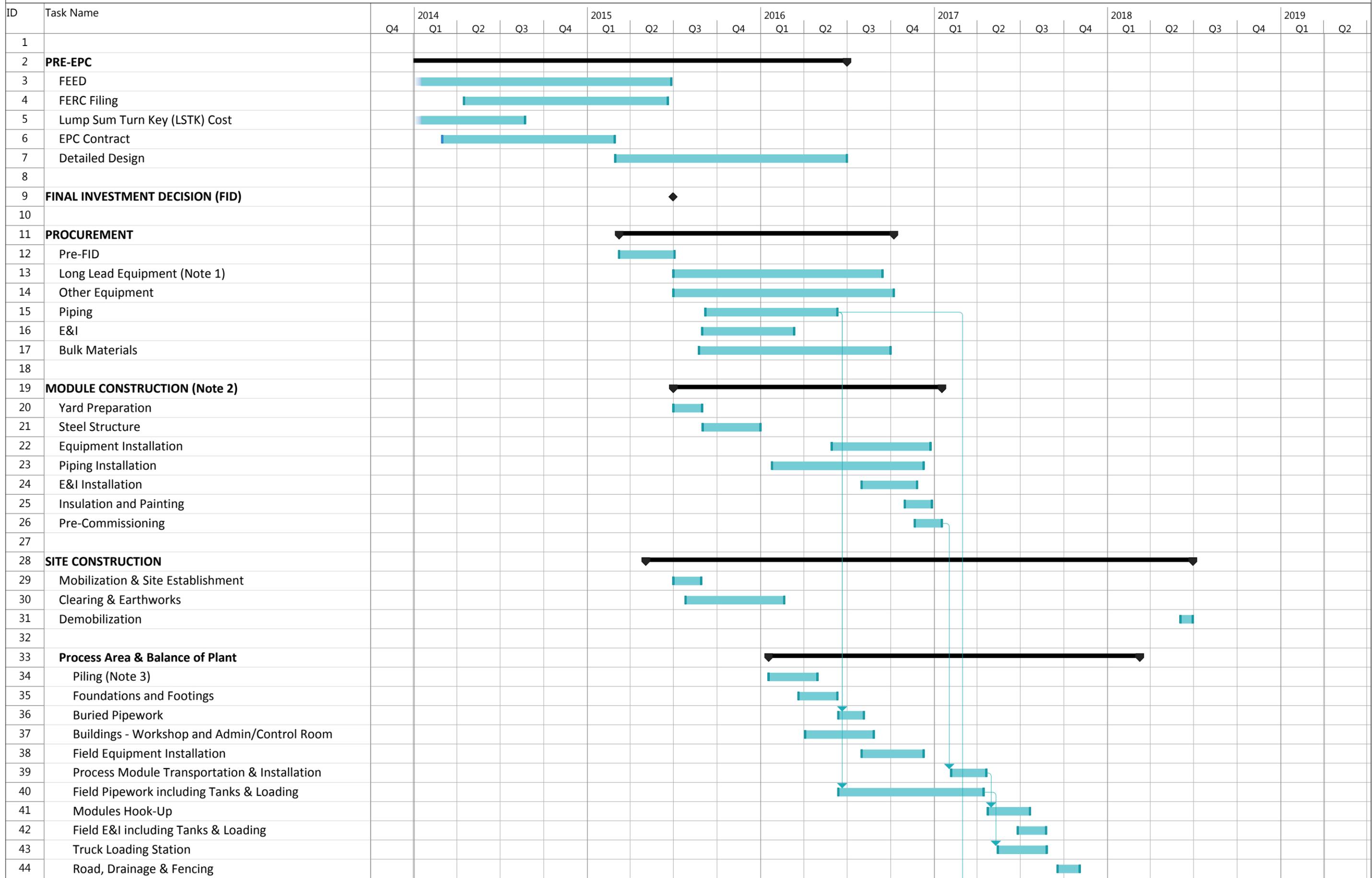


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Appendix 1.D
Project Schedule

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MAGNOLIA LNG PROJECT - CONSTRUCTION SCHEDULE



Appendix 1.E
Permits and Approvals for the Project

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Agency		Name of Plan/Permit/Authorization	Item No.	Correspondence Description or Status Summary
A.4	Native American Tribes	Section 106, NHPA Consultation	A.4a	Consultation initiated on January 17, 2014, with the Alabama Coushatta Tribe of Texas.
			A.4b	Consultation initiated on January 17, 2014, with the Caddo Nation.
			A.4c	Consultation initiated on January 17, 2014, with the Coushatta Tribe of Louisiana.
			A.4d	Enclosures that accompanied each of the letters above.
A.5	U.S. Coast Guard (USCG), Marine Safety Unit (MSU), Lake Charles, Louisiana	NEPA Pre-Filing consultation	A.5a	Initiated December 19, 2012.
		Letter of Intent (LOI) Submission (33 CFR 127.007)	NA	<ul style="list-style-type: none"> LOI process initiated January 2013.
		Waterway Suitability Assessment (WSA) consultation	NA	<ul style="list-style-type: none"> Preliminary WSA submitted to USCG Captain of the Port, Port Arthur, on March 12, 2013, along with LOI required by 33 CFR 127.007. Follow on WSA submitted in final form on November 22, 2013 (Confidential-Copy is not included)
		Letter of Recommendation from the USCG	NA	<ul style="list-style-type: none"> Pending
A.6	U.S. Department of the Interior, U.S. Fish and Wildlife Service (USFWS)	NEPA Pre-Filing consultation	A.6a	Initiated on December 19, 2012
		Endangered Species Act (ESA) Section 7 consultation	A.6b	Conference call on August 26, 2013, to discuss species of concern and evaluation of impacts.
		Fish and Wildlife Coordination Act	A.6c	Consultations initiated August 30, 2013.
		Migratory Bird Treaty Act	A.6d	Response received September 27, 2013, indicating that the Project will have 'no effect' on federally listed species and on migratory birds.
			A.6e	Conference call on February 3, 2014, to address FERC's concerns; the USFWS confirmed their previous response.
A.7	National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries Service), Habitat Conservation Division	NEPA Pre-Filing consultation	A.7a	Initiated December 19, 2012.
		ESA Section 7 consultation	A.7b	Consultations initiated August 30, 2013.
		Magnuson-Stevens Fishery Management Act Essential Fish Habitat (EFH) consultation	A.7c	Teleconferences on August 17 and October 17, 2013 (Contact Report) with October 17, 2013, meeting indicating that no further consultation would be needed, as no NOAA-managed species or EFH would be affected.
A.8	United States Environmental Protection Agency (USEPA)	Guidelines for Specification of Disposal Sites for Dredged or Fill Material (CFR 40 Part 230)	A.8a	Letter from USEPA to Louisiana Department of Natural Resources, dated January 18, 2013, in response to request for pre-application review.

Agency	Name of Plan/Permit/Authorization	Item No.	Correspondence Description or Status Summary
B. State			
B.1	Louisiana Department of Environmental Quality (LDEQ)	NEPA Pre-Filing consultation	B.1a Initiated December 19, 2012.
	LDEQ, Water Permits Division	General Permit for Large Construction Site Construction Stormwater - Notice of Intent	NA <ul style="list-style-type: none"> No draft permit to be submitted with FERC application. The Project may be exempt from the construction stormwater permit. Magnolia LNG to discuss with LDEQ.
		General Permit for Discharges of Hydrostatic Test Water	NA <ul style="list-style-type: none"> No draft permit to be submitted with the FERC application, but will be filed with the FERC after the application is submitted. Magnolia LNG intends to operate under the provisions of the general permit and meet the requirements.
		Site-specific Stormwater Pollution Prevention Plan (SWPPP)	NA <ul style="list-style-type: none"> E & E to prepare "Generic" Construction SWPPP for LDEQ General Permit for Large Construction Site Construction Stormwater –NOI. Plan should be marked "Draft" and should incorporate appropriate components of the FERC "Plans and Procedures" submitted as part of RR2. Magnolia to initiate coordination with the LDEQ relating to development of a site-specific SWPPP that would be implemented during construction and operation of the Project.
		CWA Section 401 Water Quality Certification	see A.2c <ul style="list-style-type: none"> LDEQ review is concurrent with USACE Section 10/404 Permit. Jeff Corbino of USACE did a water quality review of Magnolia's soil/sediment sampling report results report and found that the dredging effluent would meet federal and state water quality standards. See Item A.2.
		CWA LPDES Permit Application for Surface Water Discharge (Industrial Operating Stormwater Permit Application)	NA <ul style="list-style-type: none"> No draft permit to be submitted with the FERC application, but will be filed with the FERC after the application is submitted.
		CWA LPDES Permit Application for Industrial Wastewater	NA <ul style="list-style-type: none"> No draft permit to be submitted with the FERC application, but will be filed with the FERC after the application is submitted.

Agency		Name of Plan/Permit/Authorization	Item No.	Correspondence Description or Status Summary
B.1	LDEQ, Water Permits Division	CWA LPDES Permit Application for Sanitary Wastewater	NA	<ul style="list-style-type: none"> No draft permit to be submitted with the FERC application, but will be filed with the FERC after the application is submitted.
		Spill Prevention Plan (SPP)	NA	<ul style="list-style-type: none"> Draft Construction SPP will be included with the LDEQ General Permit for Large Construction Site Construction Stormwater – NOI.
	LDEQ, Water Permits Division, and the USACE	Dredging Report	NA	<ul style="list-style-type: none"> Magnolia LNG Dredging Report (dated November 11, 2013), was provided as Appendix I.2 in RR 13 submitted in November 2013. The plan will be reviewed based on FERC comments, revised as necessary, and resubmitted in the formal application anticipated in 2014.
	LDEQ, Air Permits Division	Air Quality Permit, New Source Review, Prevention of Significant Deterioration Permit, Title V Operations Permit	NA	<ul style="list-style-type: none"> Consultation initiated January 2013.
			B.1b	Air emissions dispersion modeling protocol submitted to the LDEQ on January 16, 2014.
			B.1c	Response and approval of protocol received January 22, 2014.
	IT Questionnaire	NA	<ul style="list-style-type: none"> Initiated January 2014 	
B.2	Louisiana State Historic Preservation Officer (LA SHPO)	NHPA Section 106 consultation	B.2a	Consultation initiated August 28, 2013 requesting a) concurrence with definition of the APE, and b) comments on the need for and scope of any necessary investigations.
			B.2b	Response received October 28, 2013, indicating concurrence with the APE and no need for further investigation.
		Unanticipated Discovery Plan (UDP)	B.2c	Draft UDP provided on October 21, 2013 (see RR4, Appendix 4.C).
			B.2e	Telephone follow-up on LA SHPO review of UDP on January 22, 2014.
			B.2e	Additional copy of UDP provided electronically per LA SHPO request on February 10, 2014.
			B.2f	Response dated February 10, 2014, received, indicating no objection to UDP.

	Agency	Name of Plan/Permit/Authorization	Item No.	Correspondence Description or Status Summary	
B.3	Louisiana Department of Natural Resources (LDNR), Office of Coastal Management	NEPA Pre-Filing consultation	B.3a	Initiated on December 19, 2012.	
	LDNR, Office of Conservation	NEPA Pre-Filing consultation	B.3b	Initiated on December 19, 2012.	
			B.3c	Response dated January 14, 2013, received, offering assistance with information, but declining invitation to participate in the NEPA Pre-Filing process.	
		Surface water withdrawal permit	NA	<ul style="list-style-type: none"> ▪ Permit would be contingent on the Project's raw water source and surface water withdrawal demand. No draft permit to be submitted with FERC application. 	
	LDNR, Permits and Mitigation Division	Application for construction of natural gas facilities and approval to interconnect to existing pipelines	NA	<ul style="list-style-type: none"> ▪ Preliminary coordination determined that no permit application is required. 	
			Coastal Use Permit (CUP) application, including Coastal Zone Management Act	B.3d	Solicitation of Views letter submitted October 15, 2013, requesting concurrence of CZM jurisdiction.
			Coastal Zone Management (CZM) Consistency	B.3e	Completeness letter dated October 17, 2014, received.
B.3f	Response dated October 29, 2013, received. Pursuant to LA R.S. 49:214.25.E, a CUP will not be required.				
B.4	Louisiana Department of Wildlife and Fisheries (LDWF)	NEPA Pre-Filing consultation	B.4a	Initiated December 19, 2012.	
		State-Protected Species and Fisheries consultation	B.4b	Consultation initiated September 4, 2013.	
		Resource Reports	B.4c	Response received September 13, 2013, stating that the Project will not affect state-listed sensitive species or their critical habitat.	
			B.4d	LDWF provided details on proposed Fisheries Research Center via email, July 24, 2013.	
			B.4e	Comments from LDWF on RR11 received on January 9, 2014.	
			B.4f	Meeting regarding Fisheries Research Center and follow-up to January 9, 2014 letter, on February 6, 2014 (see meeting minutes)	
		B.4g	Responses to LDWF's comments on RR11 submitted on February 14, 2014.		

Agency		Name of Plan/Permit/Authorization	Item No.	Correspondence Description or Status Summary
C. Local				
C.1	Calcasieu Historical Preservation Society	Section 106 consultation	C.1a	Initiated October 17, 2013.
			C.1b	Follow-up November 2013 through January 2014 (Contact Report).
			C.1c	Follow-up email on February 3, 2014.
			C.1d	Response received February 3, 2014.
C.2	Calcasieu Parish Administrator and Calcasieu Parish Policy Jury	Section 106 consultation	C.2a	Initiated October 17, 2013.
			C.2b	Response dated October 25, 2013.
		Floodplain Development Authorization Permit	NA	<ul style="list-style-type: none"> ▪ No draft permit to be submitted with FERC application. Responsibility of EPC Contractor.
	Building Permits	NA	<ul style="list-style-type: none"> ▪ No draft permit to be submitted with FERC application. Responsibility of EPC Contractor 	
C.3	Frazer Memorial Library	Section 106 consultation	C.3a	Initiated October 17, 2013.
			C.3b	Response received November 1, 2013.

Appendix 1.F
List of Landowners for the Project
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Appendix 1.G
Federal, State, Local, Business, and Other Stakeholders

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Federal Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE
3rd Congressional District	U. S. Representative	Rep.	Charles W.	Boustany, Jr	P. O. Box 80126	Lafayette	LA	70598	337-261-0041
Federal Energy Regulatory Commission (FERC)	Director of Gas, Environment & Engineering Office		Lauren H.	O'Donnell	888 First Street, N.E.	Washington	DC	20426	(202) 502-8325
U.S. Army Corps of Engineers (USACE)	Chief, Regulatory Branch		Martin	Mayer	Post Office Box 60267	New Orleans	LA	70160-267	504-862-2276
U.S. Coast Guard		Lt.	Jennifer	Andrews	127 W. Broad Street, Suite 200	Lake Charles	LA	70601-5680	
U.S. Coast Guard		Lt.	Will	Fediw	127 W. Broad Street, Suite 200	Lake Charles	LA	70601-5680	
U.S. Coast Guard			Leon	McClain	127 W. Broad Street, Suite 200	Lake Charles	LA	70601-5680	(337) 721-5750
U.S. Coast Guard		Lt.	Tom	Moore'	127 W. Broad Street, Suite 200	Lake Charles	LA	70601-5680	(337) 491-7804
U.S. Coast Guard	Chief	Lt.	Anthony	Walter	127 W. Broad Street, Suite 200	Lake Charles	LA	70601-5680	(337) 721-5764
U.S. Coast Guard, Dept. of Homeland Security (USCG)	Captain of the Port, Port Arthur, TX	Capt.	George (Joe)	Paitl	2875 Jimmy Johnson Blvd	Port Arthur	TX	77640-2002	
U.S. Coast Guard, Marine Safety Unit Lake Charles	Commanding Officer	Cmdr.	Will E.	Watson	127 W. Broad Street, Suite 200	Lake Charles	LA	70601-5680	(337) 491-7800
U.S. Coast Guard, Prevention Dept.			Clint	Smith	127 W. Broad Street, Suite 200	Lake Charles	LA	70601-5680	337-491-7804
U.S. Department of Energy, Office of Fossil Energy (DOE)	Manager, Natural Gas Regulatory Activities		John A.	Anderson	P.O. Box 44375	Washington	DC	20026-4375	(202) 586-0521
U.S. Dept of Commerce	Team Leader		Richard	Hartman	% LSU S.Stadium Road, Rm #266	Baton Rouge	LA	70803	(225) 389-0508
U.S. Environmental Protection Agency (EPA) Region 6	Consultant		Raul	Gutierrez, Ph.D.	1445 Ross Ave., Suite 1200	Dallas, Texas 75202	TX	75202	214-665-6697
U.S. Fish & Wildlife Service (FWS)	Endangered Species Coordinator		Josh	Marceaux	646 Cajundome Blvd	Lafayette	LA	70506	(337) 291-3110
U.S. Senate	U. S. Senator	Sen.	Mary	Landrieu	500 Poydras St., Rm. 105	New Orleans	LA	70130	504-589-2427
U.S. Senate	U. S. Senator	Sen.	David	Vitter	238 Helios Ave.	Metairie	LA	70005	504-835-6993

State Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	EMAIL	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE
Coastal Protection and Restoration Authority			Garret	Graves		1051 N 3rd St., Ste 138	Baton Rouge	LA	70802	225-342-7308
Governor's Office of Homeland Security & Emergency Preparedness			Kevin	Davis		7667 Independence Blvd	Baton Rouge	LA	70806	
House Speaker	36th Representative District	Rep.	Chuck	Kleckley	larep036@legis.state.la.us	130 Jamestown Road	Lake Charles	LA	70605	337-474-5248
Louisiana Department of Environmental Quality			Peggy	Hatch		PO Box 4301	Baton Rouge	LA	70821-4301	225-765-2800
Louisiana Department of Environmental Quality	Air Permits	Mr.	Bryan	Johnston		P.O. Box 4313	Baton Rouge	LA	80821-4313	225-219-3417
Louisiana Department of Environmental Quality	Spec Assist to the Secretary	Mr.	Paul	Miller		P.O. Box 4301	Baton Rouge	LA	70821-4301	225-219-3953
Louisiana Department of Environmental Quality	Water Permitting		Jamie	Phillippe		P.O. Box 4313	Baton Rouge	LA	80821-4313	225-219-9371
Louisiana Department of Environmental Quality	Staff Attorney		Alex	Prochaska		P.O. Box 4302	Baton Rouge	LA	70821-4302	225-219-3985
Louisiana Department of Environmental Quality	Under Secretary	Mr.	Vince	Sagnibene		P.O. Box 4301	Baton Rouge	LA	70821-4301	225-219-3953
Louisiana Department of Environmental Quality	Water Permitting	Ms.	Jennifer	Sheppard		P.O. Box 4313	Baton Rouge	LA	80821-4313	225-219-9371
Louisiana Department of Environmental Quality	Air Quality Supervisor		Tegan	Treadaway	Tegan.Treadaway@LA.GO	P.O. Box 4313	Baton Rouge	LA	70821-4313	
Louisiana Department of Environmental Quality SW Region	Regional Manager		Billy	Eakin		1301 Gadwall	Lake Charles	LA	70615	33-7491-2667
Louisiana Department of Natural Resources	Secretary	Secy.	Stephen	Chustz		PO Box 94396	Baton Rouge	LA	70804-9396	
Louisiana Department of Natural Resources	Director, Pipeline Division	Mr.	James	Mergist		P.O. Box 94275	Baton Rouge	LA	70804-9275	225-342-5585
Louisiana Department of Natural Resources, Coastal Resources	Scientist Manager Mitigation		Kelley	Templet	kelley.templet@la.gov				225-342-3124	225-342-3124
Louisiana Department of Natural Resources, Coastal Resources	Scientist, Permits West	Ms.	Jessica	Williamson	jessica.williamson@la.gov					225-342-7942
Louisiana Department of Natural Resources, Office of Coastal Management	Coastal Resources Scientist Manager - Permits	Ms.	Christine	Charrier	christine.charrier@la.gov					225-342-7953
Louisiana Department of Natural Resources, Office of Coastal Management	Administrator, Permits and Mitigation Division	Mr.	Karl	Morgan		P.O. Box 44487	Baton Rouge	LA	70802	
Louisiana Department of Natural Resources, Office of Coastal Restoration and Management	Scientist, Permits East	Mr.	Ontario	James	ontario.james@la.gov	P.O. Box 44487	Baton Rouge	LA	70804-4487	225-342-7358
Louisiana Department of Natural Resources, Office of Conservation	Engineering Regulatory Division	Mr.	Brent	Campbell	brent.campbell@la.gov					225-342-4505
Louisiana Department of Natural Resources, Office of Conservation	Assistant Commissioner	Mr.	Gary	Ross		P.O. Box 94275	Baton Rouge	LA	70804-9275	
Louisiana Department of Transportation	Egineer Administrator		Steve	Jiles		PO Box 1430	Lake Charles	LA	70602	337-437-9101
Louisiana Department of Transportation	Chief, Project Development Division		Janice	Williams P.E.		PO Box 94245	Baton Rouge	LA	70804	225-379-1502
Louisiana Department of Wildlife & Fisheries	Secretary	Secy.	Robert	Barham		PO Box 98000	Baton Rouge	LA	70898	
Louisiana Department of Wildlife and Fisheries	Assistant Secretary	Mr.	Jimmy	Anthony		P.O. Box 98000	Baton Rouge	LA	70898	
Louisiana Department of Wildlife and Fisheries	Coordinator, Natural Heritage Program	Ms.	Amity	Bass		P.O. Box 98000	Baton Rouge	LA	70898	225-765-2800
Louisiana Department of Wildlife and Fisheries	Permit Coordinator	Mr.	Dave	Butler	dbutler@wf.la.gov					225-763-3595
Louisiana Department of Wildlife and Fisheries	Biologist		Chris	Davis	rcdavis@wf.la.gov					225-765-2642
Louisiana Department of Wildlife and Fisheries	Biologist Director - Fisheries Extension	Mr.	Jason	Duet	jdnet@wf.la.gov	P.O. Box 98000	Baton Rouge	LA	70898	
Louisiana Department of Wildlife and Fisheries	Biologist	Mr.	Craig	Gothreaux	cgothreaux@wf.la.gov					
Louisiana Department of Wildlife and Fisheries	Biologist	Mr.	Ian	MaeKinnan		1213 North Lakeshore Drive	Lake Charles	LA	70601	337-491-2575
Louisiana Department of Wildlife and Fisheries	Louisiana Natural Heritage Program	Ms.	Carolyn	Michon		P.O. Box 98000, 2000 Quail Drive	Baton Rouge	LA	70898	
Louisiana Department of Wildlife and Fisheries	Assistant Secretary	Mr.	Randall	Pausina	rpausina@wf.la.gov	PO Box 98000	Baton Rouge	LA	70898	225-765-2801
Louisiana Dept of Environmental Quality	Waste Permits Division	Asst. Secy.	Sanford	Phillips		P.O. Box 4313	Baton Rouge	LA	70821-4302	(225) 219-3972
Louisiana Dept of Natural Resources	Administrator		Karl	Morgan		P.O. Box 44487	Baton Rouge	LA	70804-4487	225-342-6740
Louisiana Dept of Wildlife & Fisheries	Biologist Program Manager		Kyle	Balkum		P.O. Box 98000	Baton Rouge	LA	70808	(225) 765-2819
Louisiana Dept. Of Conservation	Commissioner	Commissioner	Jim	Welsh		PO Box 94396	Baton Rouge	LA	70804	
Louisiana Dept. Of Culture, Recreation & Tourism	State Archaeologist and Director	Dr.	Charles	McGimsey		P.O. Box 44247	Baton Rouge	LA	70804	(225) 219-4598
Louisiana Dept. of Transportation & Development	Secretary	Secy.	Sherr	Lebas		PO Box 94245	Baton Rouge	LA	70804	225-379-1200
Louisiana Dept. of Transportation and Development	District 7 (Lake Charles) Engineer Administrator	Mr.	Steve	Jiles						
Louisiana Dept. of Transportation and Development	Secretary	Ms.	Sherr	LeBas		1201 Capitol Access Road	Baton Rouge	LA	70802	225-379-1232
Louisiana Dept. of Transportation and Development	Chief, Project Development Division	Ms.	Janice	Williams	janice.p.williams@la.gov	1201 Capitol Access Road	Baton Rouge	LA	70802	225-379-1502
Louisiana Dept. of Transportation and Development	Confidential Assistant to the Secretary		Shawn	Wilson	shawn.wilson@la.gov	1201 Capitol Access Road	Baton Rouge	LA	70802	225-379-2555
Louisiana Economic Development	Business Incentive Services	Mr.	Frank	Favaloro		1051 North Third Street	Baton Rouge	LA	70802-5239	225-342-3000
Louisiana Economic Development	Secretary	Secy.	Stephen	Moret		1051 North Third St	Baton Rouge	LA	70802	225-342-3000
Louisiana Economic Development	Senior Director of Business Development		Don	Pierson		1051 North Third St	Baton Rouge	LA	70802	
Louisiana Economic Development	Director, International Commerce	Mr.	John	Voorhorst		1051 North Third Street	Baton Rouge	LA	70802-5239	225-342-3000
Louisiana Economic Development	Senior Business Development Manager	Mr.	Rick	Ward		1051 North Third Street	Baton Rouge	LA	70802-5239	225-342-3000
Louisiana Office of Cultural Development	State Historic Preservation Officer	Ms.	Pam	Breaux		P.O. Box 44247	Baton Rouge	LA	70804-44247	
Louisiana State Police	Superintendent	Col.	Mike	Edmonson		7919 Independence Blvd	Baton Rouge	LA	70807	
National Marine Fisheries Service, Southeast Regional Office	SERO Section 6 Coordinator - ESA Biologist	Ms.	Karla	Reece		263 13th Avenue, S.	St. Petersburg	FL	33701	727-824-5348
State of Louisiana	Attorney General	Attn. Gen.	James D. 'Buddy'	Caldwell		96 Marianna	Tallulah	LA	71282	318-574-4771
State of Louisiana	Lieutenant Governor	LI. Gov.	'Jay'	Dardenne		8855 Brookwood Dr.	Baton Rouge	LA	70809	225-663-8933
State of Louisiana	Governor	Gov.	'Bobby'	Jindal		1001 Capitol Access Rd.	Baton Rouge	LA	70802	225-389-1180
State of Louisiana	Secretary of State	Secy. of State	'Tom'	Schedler		7211 Brookwood Dr.	Mandeville	LA	70471	985-626-9038
State of Louisiana	Department of Agriculture and Forestry	Commissioner	Michael G. 'Mike'	Strain		19607 Hwy. 36	Covington	LA	70433	225-922-1234
State Representative	33rd Representative District	Rep.	Mike	Danahay	danahaym@legis.state.la.us	1625 Beglis Parkway	Sulphur	LA	70663	
State Representative	34th Representative District	Rep.	A.B.	Franklin	franklina@legis.la.gov	2808 East Broad St	Lake Charles	LA	70615	337-439-2897
State Representative	35th Representative District	Rep.	Brett	Geymann	larep035@legis.state.la.us	P O Box 12703	Lake Charles	LA	70612	337-491-2315

State Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	EMAIL	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE
State Representative	37th Representative District	Rep.	John	Guinn	guinnj@legis.la.gov	P.O. Box 287	Jennings	LA	70546	
State Representative	47th Representative District	Rep.	Bob	Hensgens	hengensb@legis.la.gov	407 Charity Street	Abbeville	LA	70510	
State Representative	32nd Representative District	Rep.	Dorothy Sue	Hill	hild@legis.la.gov	529 Tramel Road	Dry Creek	LA	70637	
State Senator	27th Senatorial District	Sen.	Ronnie	Johns	johnsr@legis.la.gov	1011 Lakeshore Drive, Ste 515	Lake Charles	LA	70601	
State Senator	25th Senatorial District	Sen.	Dan "Blade"	Morrish	morrishd@legis.state.la.us	119 W. Nazpique St	Jennings	LA	70546	337-477-7754
State Senator	30th Senatorial District	Sen.	John	Smith	smithj@legis.la.gov	611-B South 5th Street	Leesville	LA	71446	
U.S. Army Corps of Engineers		Mr.	Jeffrey	Corbino	Jeffrey.M.Corbino@usace.army.mil					
U.S. Army Corps of Engineers		Mr.	James	Little, Jr.						
U.S. Army Corps of Engineers, New Orleans District	Chief, Western Evaluation Section (CEMVN-OD-S)	Mr.	Ronnie	Duke		P.O. Box 60267	New Orleans	LA	70160-0267	
U.S. Coast Guard	Attorney/Advisor	Mr.	Curtis	Borland						
U.S. Coast Guard Cargo and Facilities Division (CG-FAC-2)	Chief	Commander	Jeffrey	Morgan		2703 Martin Luther King Ave SE STOP 7501	Washington	DC	20593-7501	202-372-1171
U.S. Coast Guard Deepwater Standards Division (CG-OES-4)		Mr.	Mark	Prescott		2703 Martin Luther King Ave SE	Washington	DC	20593-7509	202-372-1401
U.S. Coast Guard Deepwater Standards Division (CG-OES-4)		Mr.	Kevin	Tone		2703 Martin Luther King Ave SE	Washington	DC	20593-7509	202-372-1401
U.S. Coast Guard Office of Port and Facility Compliance - Safety Branch	Master Mariner-Civilian	Captain	David	Condino		2703 Martin Luther King Ave SE STOP 7501	Washington	DC	20593-7501	202-372-1145
U.S. Coast Guard Office of Port and Facility Compliance (CG-FAC)	Chief	Captain	Andrew	Tucci		2703 Martin Luther King Ave SE STOP 7501	Washington	DC	20593-7501	202-372-1080
U.S. Department of Energy	Director, Oil and Gas Security	Mr.	Bob	Corbin	Robert.corbin@hq.doe.gov					202-586-9460
U.S. Environmental Protection Agency	Associate Director, Compliance Assurance and Enforcement Division	Ms.	Debra	Griffin		1445 Ross Avenue, Suite 1200	Dallas	TX	75202-2733	

Local Officials and Tribes - Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	EMAIL	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE
Adai Caddo	Chief		Rufus	Davis		4500 Highway 485	Robeline	LA	71469	
Alabama Coushatta Tribe of Texas	Chairman		Kyle	Williams		371 State Park Road 35	Livingston	TX	77351	
Associated Builders and Contractors	Director, Education and Training		Kirby	Bruchhaus		222 Walcott Road	Westlake	LA	70669	
Bayou Lafourche Band	Chairman		Randy	Verdun		PO Box 856	Zachary	LA	70791	
Caddo Nation	THPO		Robert	Cast		PO Box 487	Binger	OK	73009	
Caddo Nation	Chairman		Brenda	Shernayne Edwards		PO Box 487	Binger	OK	73009	
Calcasieu Parish	Assessor		Wendy Curphy	Aguillard		1030 Holly St.	Lake Charles	LA	70601	
Calcasieu Parish	Clerk of Court	Clerk of Court	Lynn	Jones		P.O. Box 1030	Lake Charles	LA	70602	
Calcasieu Parish	Coroner	Dr.	Terry	Welke		2715 Bocage St.	Lake Charles	LA	70605	
Calcasieu Parish District Attorney	District Attorney		John	DeRosier	hcarter@cpdao.com	P.O. Box 3206	Lake Charles	LA	70602	
Calcasieu Parish Homeland Security and Emergency Preparedness	Operations Mgr		Norman	Bourceau Jr		PO Drawer 3287	Lake Charles	LA	70602	
Calcasieu Parish Homeland Security and Emergency Preparedness	Director		Dick	Gremillion	dgregillion@cppj.net	901 Lakeshore Dr., Suite 200	Lake Charles	LA	70601	
Calcasieu Parish Police Jury	Police Juror District 13		Francis	Andrepoint		1302 Fatima	Sulphur	LA	70663	
Calcasieu Parish Police Jury	Administator		Bryan	Beam	bbeam@cppj.net	P.O. Box 1583	Lake Charles	LA	70602	
Calcasieu Parish Police Jury	Assistant Administrator		Dane	Bolin	dbolin@cppj.net	P.O. Box 1583	Lake Charles	LA	70602	
Calcasieu Parish Police Jury	Police Juror District 8		'Guy'	Brame		1908 Linden Ln.	Lake Charles	LA	70605	
Calcasieu Parish Police Jury	Planning and Zoning Director		Wes	Crain	wrcrain@cppj.net	P.O. Box 1583	Lake Charles	LA	70602	
Calcasieu Parish Police Jury	Police Juror District 15		Les	Farnum		312 Oakley Dr.	Sulphur	LA	70663	
Calcasieu Parish Police Jury	Police Juror District 3		Elizabeth Conway	Griffin		903 N. Jake St.	Lake Charles	LA	70601	
Calcasieu Parish Police Jury	Police Juror District 9		Kevin	Guidry		4045 Briarfield St.	Lake Charles	LA	70607	
Calcasieu Parish Police Jury	Police Juror District 5		Nicholas 'Nic'	Hunter		810 Holly St.	Lake Charles	LA	70601	
Calcasieu Parish Police Jury	Police Juror District 2		James	Mayo		1800 N. Goos Blvd.	Lake Charles	LA	70601	
Calcasieu Parish Police Jury	President		Dennis Ray	Scott		5733 Bennie Ln.	Lake Charles	LA	70605	
Calcasieu Parish Police Jury	Police Juror District 1		Shannon	Spell		2296 Pinon Dr.	Lake Charles	LA	70611	
Calcasieu Parish Police Jury	Police Juror District 10		Tony	Stelly		P O Box 439	Iowa	LA	70647	
Calcasieu Parish Police Jury	Police Juror District 12		Ray	Taylor		2300 Currie Dr.	Sulphur	LA	70665	
Calcasieu Parish Police Jury	Police Juror District 11		Sandy	Treme		920 North Overton St.	DeQuincy	LA	70633	
Calcasieu Parish Police Jury	Police Juror District 4		Tony	Guillory		128 Kingsley	Lake Charles	LA	70601	
Calcasieu Parish Police Jury	Police Juror District 7		Chris	Landry		4336 Oaklawn Dr.	Lake Charles	LA	70605	
Calcasieu Parish Police Jury	Police Juror District 14		Hal	McMillin	hal.mcmillin@levingston.com	1423 Beech St.	Westlake	LA	70669	
Calcasieu Parish School Board	District 4		Annette	Ballard		2460 Talouse Ln.	Lake Charles	LA	70605	
Calcasieu Parish School Board	District 5		Dale	Bernard		1028 Iberville St.	Lake Charles	LA	70607	
Calcasieu Parish School Board	District 7		Mack	Dellafosse, Jr.		1917 19th St.	Lake Charles	LA	70601	
Calcasieu Parish School Board	District 3		Clara F.	Duhon		614 Oleo St.	Lake Charles	LA	70601	
Calcasieu Parish School Board	District 2		Fred	Hardy		2824 Dona Teil St.	Lake Charles	LA	70615	
Calcasieu Parish School Board	District 6		'Bill'	Jongbloed		2505 Karen Ln.	Lake Charles	LA	70605	
Calcasieu Parish School Board	District 15		Bryan	Larocque		1814 Hollow Cove Ln.	Lake Charles	LA	70611	
Calcasieu Parish School Board	Superintendent	Supt.	Wayne	Savoy		PO Box 800	Lake Charles	LA	70602	
Calcasieu Parish School Board	District 8		Jim'	Schooler		444 Ashland St.	Lake Charles	LA	70605	
Calcasieu Parish School Board	District 14		Roman L.	Thompson		4033 Briarfield Ln.	Lake Charles	LA	70607	
Calcasieu Parish Sheriff Dept	Chief Depputy		Gary 'Stitch'	Guillory		5400 East Broad St	Lake Charles	LA	70615	
Calcasieu Parish Sheriff Dept	Sheriff	Sheriff	Tony'	Mancuso		5400 East Broad St	Lake Charles	LA	70615	
Calcasieu Parish Sheriff Dept	Asst. Chief Deputy		G. Buba	Mayeaux		5400 East Broad St	Lake Charles	LA	70615	
Calcasieu Parish Sheriff Dept	Chief Deputy		Keith	Murray		4200 Kirkman St	Lake Charles	LA	70607	
Calcasieu Parish Sheriff Dept	Administator Asst.		Heather	Simon		5400 East Broad St	Lake Charles	LA	70615	
Calcasieu Parish Sheriff Dept	Special Services Commander		Matt	Vezirot		5400 East Broad St	Lake Charles	LA	70615	
Cameron Parish Office of Emergency Preparedness (OEP)	Secretary		Cassandra	Duhon		PO Box 374	Cameron	LA	70631	
Cameron Parish Office of Emergency Preparedness (OEP)			Danny	Lavergne		PO Box 374	Cameron	LA	70631	
Cameron Parish Police Jury	Administator		Ryan	Bourriaque	ryanb@camtel.net	PO Box 1280	Cameron	LA	70631	
Cameron Parish School Board	Superintendent	Supt.	Stephanie	Rodrique		PO Box 801	Lake Charles	LA	70603	
Chitimacha Tribe of Louisiana	Chairman		John	Darden		PO Box 661	Charenton	LA	70523-0661	
Choctaw-Apache Community of Ebarb	Chief		John	Porcell		PO Box 1428	Zwolle	LA	71486	
City of Lake Chalres	Councilwoman District A		Mary	Morris		2345 See St.	Lake Charles	LA	70601	
City of Lake Charles	Attorney	Mr.	Billy	Loftin		113 Dr. Michael DeBakey Dr.	Lake Charles	LA	70601	337-310-4300
City of Lake Charles	Councilman District B		Luvertha	August		2010 E. Mill St.	Lake Charles	LA	70601	
City of Lake Charles	City Council (collective)		City	Council	citycouncil@cityoflc.us	326 Pujc Street	Lake Charles	LA	70601	
City of Lake Charles	Councilman District G		Mark	Eckard	mark.eckard1@gmail.com	4502 Autumnwood Ln.	Lake Charles	LA	70605	
City of Lake Charles	Councilman District C		Rodney	Geyen		1531 Sixth Ave.	Lake Charles	LA	70601	
City of Lake Charles	Councilman District D		John	Ieyoub	jkieyoub@gmail.com	2018 Charvais Dr.	Lake Charles	LA	70601	
City of Lake Charles	Councilman District F		Dana Carl	Jackson		1705 Illinois St.	Lake Charles	LA	70607	
City of Lake Charles	Mayor	Mayor	Randy	Roach	rroach@cityoflc.us	161 E. Greenway St.	Lake Charles	LA	70605	
City of Lake Charles	Councilman District E		Stuart	Weatherford		1508 W. Sale St.	Lake Charles	LA	70605	
City of Lake Charles	Administrative Assistant		Richard	Broussard		4200 Kirkman St	Lake Charles	LA	70607	
City of Lake Charles Fire Department	Fire Chief	Chief	Keith	Murray		4200 Kirkman St	Lake Charles	LA	70607	
City of Lake Charles Fire Department	Planning and Research Officer		Robin	Rhorer		4200 Kirkman St	Lake Charles	LA	70607	
City of Lake Charles Police Department	Police Chief	Chief	Don	Dixon		830 Enterprise Blvd.	Lake Charles	LA	70601	
City of Sulphur	Mayor	Mayor	Chris	Duncan		101 N. Huntington Street	Sulphur	LA	70663	
Clifton Choctaw Tribe	Chairman		Tom	Neal		1312 Clifton Road	Clifton	LA	71447	

Local Officials and Tribes - Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	EMAIL	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE
Coushatta Tribe of Louisiana	Chairman		Kevin	Sickey		PO Box 818	Elton	LA	70532	
Coushatta Tribe of Louisiana	Chairman		Kevin	Sickey		PO Box 818	Elton	LA	70532	
Diocese of Lake Charles	Vicar General	Msgr.	Daniel	Torres		P.O. Box 3223	Lake Charles	LA	70602-3223	
Four Winds Trive LA Cherokee	Principal Chief		Jackie	Womack		306 W 1st St	DeRidder	LA	70634	
Grand Caillou/Dulac Band	Chief		Shirell	Parfait-Dardar		5057 Bayouside Dr	Chauvin	LA	70344	
Isle de Jean Charles Band	Chief		Albert	Naquin		100 Dennis St	Montegut	LA	70377	
Jena Band of Choctaws	Chief		Beverly Cheryl	Smith		PO Box 1428	Jena	LA	71432	
LA Workfore Commission	Executive Director		Curt	Eysink		PO Box 94094	Baton Rouge	LA	70804	
LA Workfore Commission	Director		David	Helveston		PO Box 94094	Baton Rouge	LA	70804	
LA Workfore Commission	WIB Director		Stephanie	Seemion		2424 3rd Street	Lake Charles	LA	70601	
Lake Area Industry Alliance	Executive Director		Larry	DeRoussel		PO Box 2225	Lake Charles	LA	70602	
Lake Charles Harbor & Terminal District	Commissioner		Daryl	Burckel	burckel@bellsouth.net	3287 Glen Eagle Drive	Lake Charles	LA	70605	
Lake Charles Harbor & Terminal District	Commissioner		Dudley	Dixon	ddixon1995@aol.com	1311 Dewey St	Westlake	LA	70669	
Lake Charles Harbor & Terminal District	Commissioner		Mike	Eason	mkeason2000@yahoo.com	3130 Saint Andrews Drive	Lake Charles	LA	70605	
Lake Charles Harbor & Terminal District	Commissioner		Elcie	Guillory	rubory@aol.com	509 St. Mary Street	Lake Charles	LA	70615	
Lake Charles Harbor & Terminal District	Commissioner		John	LeBlanc	jleblanc@portlc.com	948 N. Kade Street	Lake Charles	LA	70605	
Lake Charles Harbor & Terminal District	Commissioner		Barbara	McManus	bamcmanus10959@gmail.com	240 Shell Beach Drive	Lake Charles	LA	70601	
Lake Charles Harbor & Terminal District	Executive Director		Bill	Rase	brase@portlc.com	PO Box 3753	Lake Charles	LA	70602	
Lake Charles Harbor & Terminal District	Commissioner		Walter	Sanchez	wsanchez@walsanchez.com	4928 Opal Drive	Lake Charles	LA	70605	
Louisiana Wildlife Federation	District 7, Vice President		Fred	Borel		317 W Sallier St	Lake Charles	LA	70601	
Pointe-Au-Chien Tribe	Chairman		Charles	Verdin		PO Box 416	Montegut	LA	70377	
SWLA Economic Development Alliance	VP- Economic Development		David	Conner	dconner@allianceswla.org	PO Box 3110	Lake Charles	LA	70602	
SWLA Economic Development Alliance	Vice President of Workforce Development		Richard	Smith	rsmith@allianceswla.org	PO Box 3110	Lake Charles	LA	70802	
SWLA Economic Development Alliance	President/CEO		George	Swift	gswift@allianceswla.org	PO Box 3110	Lake Charles	LA	70602	
Tunica-Biloxi Tribe of Louisiana	Tribal Chairman		Earl	Barbry Sr		PO Box 1589	Marksville	LA	71351	
United Houma Nation	Principal Chief		Thomas	DarDar Jr		20986 Hwy 1	Golden Meadow	LA	70357	
United Way of Southwest Louisiana, Inc.	President/CEO		Denise	Durel		715 Ryan Street, Suite 102	Lake Charles	LA	70601-4242	
Westlake Chemical Corporation	Chairman of SW LA Safety Council		Joe	Adrepont		PO Box 2449	Sulphur	LA	70664	

Businesses, Organizations, Citizens - Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE	EMAIL
A+ Motel & RV Park			Deanette	Franks	4631 Hwy 27 S	Sulphur	LA	70665		
Alcoa Carbon Products			Mack	Whittaker	P. O. Box 3738	Lake Charles	LA	70602		
Allied Barton Security Services	Business Development Manager		Suzanne	Chisholm	3222 Burke, Suite 105B	Pasadena	TX	77504	(713) 477-4449	
American Red Cross Of Southwest Louisiana			Bobbi	Zaunbrecher	3512 Kirkman Street	Lake Charles	LA	70607-1836		
ASCO					307 Bunker Road	Lake Charles	LA	70605		
Associated Builders and Contractors	Executive Director	Mr.	Kirby	Bruchhaus	19251 Highland Rd.	Baton Rouge	LA	70809	225-752-1415	
Baker Engineering			Bill	Stein	600 Bavou Pines East, Ste B	Lake Charles	LA	70601		
BASDEN AGENCIES INC	President		Alan	Basden	1009 W. McNeese St.	Lake Charles	LA	70605	(337) 479-2424	
Beard Construction			Warren	King	3970 Rose Dale Rd	Port Allen	LA	70767		wking@beardconstructiongroup.com
BG LNG Services			Marc	Hopkins	5444 Westheimer Road # 1775	Houston	TX	77056-5397	(713) 599-3747	
BG LNG Services			Robert	Parker	5444 Westheimer Road, Suite 1775	Houston	TX	77056-5326		
BG LNG Services, LLC	Manager Marine Terminals		Scott	Ervin	5444 Westheimer, Suite 1200	Houston	TX	77056	(713) 599-3750	
Bollinger Calcasieu, L.L.C.					8086 Global Drive	Sulphur	LA	70665-8807		
Calcasieu Council on Aging			Rosalind	Berry	3950 Hwy. 14	Lake Charles	LA	70607		
Calcasieu Historical Preservation Society	President	Ms.	Nancy	Moss	P.O. Box 1214	Lake Charles	LA	70602		
Calcasieu Historical Preservation Society	Advocacy Chair		Adley	Cormier	P.O. Box 1214	Lake Charles	LA	70602		ajpcormier@aol.com
Calcasieu Historical Preservation Society	Treasurer	Mr.	Matt	Young	P.O. Box 1214	Lake Charles	LA	70602		
Calcasieu League for Environmental Action Now					329 Wilson Ave.	Lake Charles	LA	70601		
Calcasieu Parish Assessor's Office			Allyson	Bourriaque	1011 Lakeshore Dr	Lake Charles	LA	70601		
Calcasieu Parish Central Library	Library Director	Dr.	Gabriel	Morley	301 W. Claude St.	Lake Charles	LA	70605	337-721-7166	
Calcasieu Parish Central Library	Public Information Officer		Christy	Duhon	301 W. Claude St.	Lake Charles	LA	70605		
Calcasieu Parish Policy Jury	District 12 of Ward 3 Waterworks		Kelly	Goodman	P.O. Box 4767	Lake Charles	LA	70606		
Calcasieu Police Jury			Alberto	Galan						agalan@cpj.net
Calcasieu Police Jury			Jennifer	Wallace						jwallace@cpj.net
Cameron LNG	Health , Safety, Security & Environmental Manager		Steve	Trahan	P.O. Box 439	Hackberry	LA	70631	(337) 680-4526	
Cameron LNG, LLC	Terminal Manager		Randy	Oakley	301 N. Main Street	Hackberry	LA	70645	(337) 762-3256	
Cameron Parish Chamber of Commerce					P O Box 1248	Cameron	LA	70631		
Cameron Parish Library	Library Director		Patricia	Boatman	PO Box 1130	Cameron	La	70631		pboatman@cameron.lib.la.us
Cameron Parish Police Jury	Parish Administrator		Ryan	Bourriaque	Post Office Box 1280	Cameron	LA	70631	337-775.5718	ryanb@camtel.net
Career Goals			Greg	David						greg@careergoalsinc.com
Career Goals			Wendy	Harper						wendy_mann@suddenlink.net
CDI Engineering Solutions	Business Development Manager Mechanical Engineer		Mario	Espinosa	4041 Essen Lane, Suite 10	Baton Rouge	LA	70809	256634488	
CH2MHill	Director of Ports and Harbors		Allen	Dupont	2800 Veterans Memorial Blvd, Ste 252	Metairie	LA	70002	(504) 832-9509	
Chamber SWLA			Paula	Ramsey						pramsey@allianceswla.org
Cheniere LNG, Inc.	Community Relations Manager, Louisiana		James	Ducote	5582 Gulf Beach Highway	Cameron	LA	70631	(337) 569-2311	
Chevron			Russ	Manuel	PO Box 623	Westlake	LA	70669		
CINTAS			Deanne	Blanchard	311 E. Hale St, C	Lake Charles	LA	70601		
Cintas			Caprice	Bush	408 Pryce St	Lake Charles	LA	70601		
CITGO			Winston	Ebarb	1293 Eldridge Parkway	Houston	TX	77077		
CITGO	Sr. Corporate Counsel		Charles	Harper	PO Box 1562	Lake Charles	LA	70602	(337) 708-7422	
CITGO			Steve	Newman	1293 Eldridge Parkway	Houston	TX	77077		
CITGO	Marine Technical Services Manager	Capt.	Thomas	Fanning	1293 Eldridge Parkway	Houston	TX	77077	(832) 486-1558	
CITGO - Lake Charles			Ken	Rodericks	P.O. Box 1562	Lake Charles	LA	70602	(337) 708-8447	
CITGO Petroleum Corporation	Special Assignment Area Manager Oil Movement		Alirio	Zambrano	P.O. Box 1562	Lake Charles	LA	70602	(337) 708-6614	
Citizen	Citizen		Charlie	Atherton	122 Vine St	Sulphur	LA	70663		
City of Lake Charles			John	Cardone	809 Kirby St	Lake Charles	LA	70602		
City of Lake Charles			Eligha	Guillory	PO Box 900	Lake Charles	LA	70602		
City of Westlake			Lori	Manuel	908 Guillory St	Westlake	LA	70669		
CLM Equimet Co., Inc	Account Manager		Tony	Colletta	4851 E. Napoleon	Sulphur	LA	70663	(337) 625-5942	
Colt Group			Ernest	Broussard	724 Kirby St	Lake Charles	LA	70601		
Colt Group			Brandon	Broussard	724 Kirby St	Lake Charles	LA	70601		
Congressman Boustany			Joe	Hill	1 Lakeshore Dr, #1775	Lake Charles	LA	70629		
Congressman Boustany Office			Charles	Dalgleish						charles.dalgleish@mail.house.gov
Conoco Phillips	Plant Manager		Willie	Tempton	P.O. Box 37	Westlake	LA	70669	(337) 491-5222	
ConocoPhillips	Director, Marine Terminal Advisors-Commercial Marine Risk Management	Capt.	Kurt	Hallier	600 North Dairy Ashford	Houston	TX	77079-1175	(281) 293-1833	
Contract Land Staff			Greg	Spicer						greg.spicer@contractlandstaff.com
Contractor			Kay & Larry	Woodcock	PO Box 1446	Lake Charles	LA	70602		
Convention & Visitors Center			Donna	Richard	1301 Shellbeach St	Lake Charles	LA	70601		
Corps of Engineers	Project Manager - Calcasieu River		Tracy	Falk	P.O. Box 60267	New Orleans	LA	70160-0267	(504) 862-2971	
Corps of Engineers	Deputy District Commander	LTC	Nathan	Joseph	P.O. Box 60267	New Orleans	LA	70160-0267	(504) 862-2077	
Corps of Engineers			Calix	MVN	P.O. Box 60267	New Orleans	LA	70160-0267	(504) 862-1378	
CPRA			Natalie	Peyronnin	450 Laurel St., Suite 1208	Baton Rouge	LA	70801		
Crowley Marine Services			Rick	Bastian	8200 Big Lake Rd.	Lake Charles	LA	70605		

Businesses, Organizations, Citizens - Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE	EMAIL
Crowley Marine Services	Port Captain	Capt.	Stephen	Porter	8200 Big Lake Rd.	Lake Charles	LA	70605	(337) 478-2403 ext 22	
CSRS			Travis	Woodard	6767 Perkins Road, Suite 200	Baton Rouge	LA	70808		
CSRS, INC			Lyles	Budden	6767 Perkins Road, B12	Baton Rouge	LA	70808		
D A Wolfe Workwear			Jim	Hoggins						jim@dawolfe.com
Devall Towing			Joe	Devall	2244 Swisco Road	Sulphur	LA	70663		
Dunham Price Group, LLC	Material Handling, LLC Manager		Dav	Godsey	P.O. Box 760	Westlake	LA	70669-0760	(337) 436-4051	
Dynamic Industries			Ralph	Clements						
Dynamic Industries, Inc	Operations		Robert	Ward	600 Jefferson St., Suite 1400	Lafayette	LA	70501	(337) 480-6009	
Dynamic Industries, Inc.	Facility Manager		Don	Darbonne	3744 Henry Pugh Blvd.	Lake Charles	LA	70605	(337) 480-6009	
Empire of the Seed			Rick	Richard	PO Box 2221	Lake Charles	LA	70602		
Environmental Response Services	Pres. /Gen Mngr.		Neil	Clark	P.O. Box 4288	Lake Charles	LA	70606		
ERA Moffett Real Estate			Mary Ann	Booth						maboath@eramoffett.com
Frazer Memorial Library	Archivist and Special Collections	Ms.	Patti	Threatt	Box 91445, McNeese State University	Lake Charles	LA	70609	337-475-5731	pthreatt@mcneese.edu
G2X Entegy	Vice President of Project Development		Steve	Hirsh	600 Travis, Suite 3680	Houston	TX	77002		
GICA (Gulf Intracoastal Canal Association)	Executive Director		Jim	Stark	P.O. Box 6846	New Orleans	LA	70174	(901) 490-3312	
GMA Architect			Jason	Mitchell	900 Ryan St, Suite 600	Lake Charles	LA	70601		
Grace Davison					P.O. Box 3247	Lake Charles	LA	70602-3247		
Greenfield Logistical Solutions of LA			Sam	Pate	PO Box 1567	Lake Charles	LA	70602		
Gulf Coast Environmental Labor Coalition					3515 N I 10 Service Rd. W	Metairie	LA	70002-5931		
H & E Equipment			Neil	Simoneaux	1918 Southwood Drive	Lake Charles	LA	70605		
H & E Equipment			Gray	Vanek	2200 Louis Allernon Pky	Sulphur	LA	70663		
Harbor Docking & Towing			Dwayne	Chatoney	P. O. Box 248	Westlake	LA	70663		
Harvis DeVille & Assoc			Payton	Kieth	825 Laurel St	Baton Rouge	LA			
Hixson Funeral Home			Judy	Barrilleaux						joanna.barrilleaux@dignitymemorial.com
Holiday Inn & Suites			Francesca	Borra	2940 Lake St	Lake Charles	LA	70601		
Holiday Inn Express Sulphur			Rhonda	Colletta	102 Mallard St	Sulphur	LA	70665		sales@hiesulphur.com
Hotels of Lake Charles			Nick	Zeaver	320 S. Cities Service	Sulphur	LA	70663		
HSE			James	Ambrose	1057 Walnut Hill Road	Leesville	LA	71446		
Hutco			Greg	Carlin	PO Box 27	Sulphur	LA	70665		
Iberia Bank			Barry	Brown	4440 Nelson Road	Lake Charles	LA	70601		
Iberia Bank			John	Mitchell	5723 W. Dietrich Loop	Lake Charles	LA	70605		
Iberia Bank			Steven	Peer	4440 Nelson Road	Lake Charles	LA	70605		
IFG Port Holdings, LLC	Chairman & Chief Executive		Kabir	Ahmad	1500 Broadway, Suite 2011	New York	NY	10036	(212) 302-9000	
IMCAL			Grant	Bush	326 Pupo St	Lake Charles	LA	70662		
Inchcape Shipping Services	Port Manager		Mark	Pippin	710 West Prien Lake Road	Lake Charles	LA	70601	(337) 474-3433	
ISC Constructors, LLC	Vice President Beaumont Office		Craig	Messer	6350 Walden Road	Beaumont	TX	77707	(409) 842-3500	
Isle of Capri			English	Josey	271 Hampton Court	Lake Charles	LA	70605		
J Walker & Co			Jonald	Walker	949 Ryan St, Suite 100	Lake Charles	LA	70601		
JHC			Jim	Henry	908 Guillory St	Westlake	LA	70669		
Knights of Columbus	Area Coordinator		Donald	Laurent	P.O. Box 3223	Lake Charles	LA	70602-3223		
La CPRA OCPR	Engineering Supervisor		Jerome	Zeringue	PO Box 44027	Baton Rouge	LA	70804		
Lake Area Industry Alliance	Executive Director		Larry	DeRoussel	P. O. Box 2225	Lake Charles	LA	70602	(337) 436-6800	
Lake Charles Harbor & Terminal District	Director of Navigation and Security		Channing	Hayden	Post Office Box 3753	Lake Charles	LA	70602	(337) 493-3620	
Lake Charles Harbor and Terminal District	Executive Director	Mr.	William	Rase, III	P.O. Box 3753	Lake Charles	LA	70602	337-439-3661	
Lake Charles Pilots		Capt.	Charles	Morrison	4902 Ihles Road	Lake Charles	LA	70605	(337) 436-0372	
Lake Charles Pilots			George	Mowbray	4902 Ihles Road	Lake Charles	LA	70605		
Lake Charles Pilots	President		Dave	Trent	4902 Ihles Road	Lake Charles	LA	70606		
Lake Charles Pilots	Business Manager	Mr.	Dan (Blade)	Morrish						officemr@lakecharlespilots.com
Lake Charles Pilots Association		Capt.	Brett	Palmer	4902 Ihles Rd	Lake Charles	LA	70605		
LaQuinta			Alicia	Boutte	1201 W. Prien Lake Rd	Lake Charles	LA	70601		
Lauberge Casino			Kimberly	Dixon	3202 Nelson Road	Lake Charles	LA	70601		
LC Convention & Visitors Bureau			Stephanie	Guilbeaux						squilbeaux@visitlakecharles.org
LEEVAC	VP/General Manager		Richard	Ortego	8200 Big Lake Rd., Bldg. A	Lake Charles	LA	70605	(337) 214-0532	
Legacy Consulting			Ryan	Whitford	2845 Country Club Rd, #906	Lake Charles	LA	70605		
Leucadia National Corporation	Consultant		Cliff	Kerr	7318 Fountain Spray	Katy	TX	77494	(281) 394-2320	
LNG Terminal Services			David	Broussard	PO Box 4068	Lake Charles	LA	70605		david@lngtsing.com
Louisiana Radio Communications			David	Duzan						dduzan@lrcwireless.com
Louisiana State Police			Chris	Guillory	805 Main St	Lake Charles	LA	70615		
Louisiana State Police			Sean	LaFleur	805 Main St	Lake Charles	LA	70615		
Louisiana State Police			Ross	McCain	805 Main St	Lake Charles	LA	70615		
Louisiana State Police			John	Porter	805 Main St	Lake Charles	LA	70615		
Louisiana Workforce Commission	Executive Director		Curt	Evsink	Post Office Box 94094	Baton Rouge	LA	70804	225.342.3001	cevsink@lwc.la.gov
Louisiana Workforce Commission	Policy Assistant	Mr.	David	Helveston	P.O. Box 94094	Baton Rouge	LA	70804		
M Jude Benoit AIA, LLC			Jude	Benoit	PO Box 1338	Lake Charles	LA	70602		
Manpower			Dana	Dalovisio						dana.dalovisio@manpower.com
Manpower			Becky	Franks						becky.franks@manpower.com
Manpower			Tammy	McEwin						tammy@mcewin@manpower.com
Marine Spill Response Corp.					980 West Lincoln Road	Lake Charles	LA	70602		
McNeese State University			Nikos	Kiritsis	PO Box	Lake Charles	LA	70606		

Businesses, Organizations, Citizens - Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE	EMAIL
McNeese State University	President	Dr.	Philip C.	Williams	Box 93300	Lake Charles	LA	70609		
McNeese State University			Janet	Woolman	PO Box 90655	Lake Charles	LA	70609		
Mixing & Process Equipment Company			Ward	Howard	5333 River Road	New Orleans	LA	70123	(504) 734-5877	
Montell USA, Inc.					P. O. Box 1687	Lake Charles	LA	70602		
Moreno Group LLC	President - Branded Services		John	Alford	101 South Bernard Road	Broussard	LA	70518		
Mossville Environmental Action Now			Dorothy	Felix	650 Prater Road	Westlake	LA	70669		
Nature Conservancy					122 Williamsburg St.	Lake Charles	LA	70605		
NOAA	Navigation Manager, Eastern Gulf		Tim	Osborn	635 Cajundome Blvd.	Lafayette	LA	70506	337-291-2111	
Office of Coastal Protection and Restoration	Science Director		Natalie	Snider	450 Laurel Street, Suite 1200	Baton Rouge	LA	70801	(225) 342-8786	
Office of Conservation	Director, Pipeline Division		James	Mergist, P.E.	Post Office Box 94275	Baton Rouge	LA	70804	225.342.9137	james.mergist@la.gov
Ohmstead			Richard	Walker	1750 Swisco Road	Sulphur	LA	70665		
OSRV Gulf Coast Responder	Master		Fred	Eason	3961 Henry Pugh Blvd.	Lake Charles	LA	70605	(337) 478-4617	
Panhandle Energy	Vice President - South/LNG Divisions-Ops & Engr		Dennis	Odum	8100 Big Lake Road	Lake Charles	LA	70605	(337) 475-4224	
Polaris Engineering			Ray	Fontenot	212 Pine St	Lake Charles	LA	70601		
Port Aggregates	Executive Vice President		Tim	Guinn	314 North Main St	Jennings	LA	70546	337-824-7625	
Port Aggregates			Andrew	Guinn	314 N Main St	Jennings	LA	70546		
Port of Lake Charles			Donald	Brinkman	150 Marine St	Lake Charles	LA	70661		
Port of Lake Charles			Todd	Henderson	PO Box 3753	Lake Charles	LA	70602		
Port of Lake Charles			John	LeBlanc	PO Box 3753	Lake Charles	LA	70602		
PPG			Mike	Hardin	2200 Old Spanish Trail	Lake Charles	LA	70605		
PPG Chlor-Alkali & Derivatives	Manager, Logistics/Customer Service		Terri	Angolini	P. O. Box 1000	Lake Charles	LA	70602-1000	(337) 708-4709	
Providence			Mike	Dever	PO Box 3110	Sulphur	LA	70664		mikedever@providenceeng.com
RC Cleaning			Randy	Mingo	7231 Burgundy Dr	Lake Charles	LA	70605		
Recon Services			Karl	Pecklaus	4036 Maplewood St	Sulphur	LA	70663		
Reynolds Metals					3943 Granger Road	Lake Charles	LA	70605		
Robodeaux's			Robert	Lewis	16473 Turfgrass Rd	Welsh	LA	70591		
Salvation Army		Maj.	David	Craddock	3020 Legion St.	Lake Charles	LA	70601		
Sam Hebert Financial			Amber	Mize						ambermatte@yahoo.com
Seabulk Towing, Inc.	Operations Manager		Aaron	Andrus	PO Box 915	Lake Charles	LA	70602		
Seabulk Towing, Inc.	Health and Safety Manager		Brian	Kennedy	PO Box 915	Lake Charles	LA	70602		
Sempre Energy	VP Government Affairs		Mark	Nelson	16945 Northchase Dr., Ste. 1150	Houston	Tx		(619) 696-2060	
Sen. Landrieu's Office			Mark	Hebert	One Lakeshore Dr, St. 1260	Lake Charles	LA	70629		
Ship to Shore	Owner		Sheron	Faulk	4313 Lake St	Lake Charles	LA	70605-4309	(337) 474-0730	
Sierra Club	Delta Chapter		Hayward	Martin	PO Box 52503	Lafayette	LA	70505		
SLCUC	Executive Director		Dale	Logan	1201 Ryan St	Lake Charles	LA	70602		
Sowela Technical Community College	Chancellor	Dr.	Neil	Aspinwall	3820 J. Bennett Johnston Avenue	Lake Charles	LA	70615	337.491.2678	neil.aspinwall@sowela.edu
Sowela Technical School		Dr.	Joseph	Fleishman	3820 Sen J Bennett Johnston Ave	Lake Charles	LA	70601		
Stine Financial			Cindy	Ellender						cindy@stineadvisors.com
Suddenlink Media			Brenda	Ford						brenda.ford@suddenlink.com
Suddenlink Media			Maria	Mott						maria.mott@suddenlink.com
SW Region, Natural Resources - Fisheries	Area Agent		Kevin	Savoie	7101 Gulf Hwy	Lake Charles	LA	70607		
SWLA Alliance			David	Conner	PO Box 3110	Lake Charles	LA	70602		
SWLA Alliance			RB	Smith	PO Box 3110	Lake Charles	LA	70602		
SWLA Central Trades			Charles	Bennett	127 Roberta Dr	Sulphur	LA	70663		
SWLA Safety Council		Mr.	Joe	Andrepoint	1201 Ryan St.	Lake Charles	LA	70601	337-436-3354	
The Verandah at Graywood			Kim	Dorn						kimkdorn@aol.com
Tollunay-Wong Engineering			Philip	Grice	713 E. Napoleon	Sulphur	LA	70663		
Tollunay-Wong Engineering			Nikki	Tibb	713 E. Napoleon	Sulphur	LA	70663		
Townsquare Media			Anthony	Barte	900 N Lakeshore Dr	Lake Charles	LA	70601		
Triad Electric			Danny	Campbell	3209 Hwy 90	Westlake	LA	70669		
Trunkline LNG	Manager, Operations		Jeffrey	Brightwell	8100 Big Lake Road	Lake Charles	LA	70605-0300	(337) 475-4252	
Trunkline LNG	Technical & Marine Services Operations and Engineering		Steven	Couch	8100 Big Lake Road	Lake Charles	LA	70605	(337) 475-4287	
Trunkline LNG Company LLC	Director of LNG Maintenance & Technical PE Operations		Scott	Hancock	8100 Big Lake Road	Lake Charles	LA	70605	(337) 475-4292	
Turner Industries			Ben	Bourgeois	2346 Swisco Road	Sulphur	LA	70665		
United Way			Beverly	Smith	715 Ryan St	Lake Charles	LA	70601		
US Coast Guard			Jennifer	Andrew	127 W. Broad St	Lake Charles	LA	70601		
US Coast Guard			Trey	Gonzales	127 W Broad St	Lake Charles	LA	70601		
Venco					P. O. Box 3187	Lake Charles	LA	70602		
Vessel Traffic Service	Director		Michael	Measells	2901 Turtle Creek Dr.	Port Arthur	TX	77642	(409) 719-5080	
Waste Management of L.C.			Frank	LaBarbera	536 Wesley Road	Lake Charles	LA	70615		
Wells Fargo			Bob	Jones	1 Lakeshore Dr	Lake Charles	LA	70629		
West Calcasieu Port	Port Director		E Lynn	Hohensee	P.O. Box 1538	Sulphur	LA	70664	(337) 794-4809	
West Cameron Port	Port Director		Stephen	Broussard	P O 1271	Cameron	LA	70631	(337) 775-5206	
West Gulf Maritime Association	Senior Vice President - Maritime Affairs		Niels	Aalund	1717 Turning Basin Dr., Suite 200	Houston	TX	77029	(713) 715-6424	
West Gulf Maritime Association	Director of Maritime Affairs		Niels	Lyngso	1717 Turning Basin Dr., Suite 200	Houston	TX	77029	(713) 715-6443	
Westlake Polymers Corporation			Mike	Shell	900 Hwy 108	Sulphur	LA	70665-8527		
Wholesale Electric			M	Bradford	2916 E Napoleon	Sulphur	LA	70663		

Businesses, Organizations, Citizens - Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE	EMAIL
Wingate			Heather	Jabusch	300 Arena Road South	Sulphur	LA	70665	337-527-5151	
Wingate			Deborah	Trussell	300 Arena Road South	Sulphur	LA	70665	337-527-5152	
			Andre	Alito	5751 Old Camp Road	Holmwood	LA	70630		
			Paul	Bellow	503 N Grace St	Lake Charles	LA	70615		
			Kathleen Dorsey	Bellow	503 N Grace St	Lake Charles	LA	70615		
			Alan	Courmier	340 N Post Oak Rd	Sulphur	LA	70663		
			Bob	Emmerson	25165 Ramrock	Kingswood	TX	77365		
			Louis & Penny	Haxthausen	PO Box 1892	Lake Charles	LA	70605		
			Kecee	Lewis	1702 N Junior St	Lake Charles	LA	70601		
			David	Nunez	6713 E Calcasieu Drive	Lake Charles	LA	70605		
			Cal	Schexneider	828 4th Ave	Lake Charles	LA	70601		
			Tony	Theriot	10020 Broussard Road	Bell City	LA	70630		
			Donald	Vidrine	9 Poinsetta Rd	Sulphur	LA	70663		
		Mr.	Joseph	Delafield	Whitney Bank Building, 3401 Ryan Street, Suite 307	Lake Charles	LA	70605	337-477-4655	

Media

OFFICE	POSITION	TITLE	FIRST NAME	LASTNAME	ORGANIZATION	DELIVERY	CITY	STATE	ZIP	PHONE	EMAIL	WEB ADDRESS
Newspaper/Daily	Managing Editor		Bobby	Dower	American Press	P.O. Box 2893	Lake Charles	LA	70602	337-494-4061	bdower@americanpress.com	www.americanpress.com
Newspaper/Daily	Industry Reporter		Frank	Dicesare	American Press	P.O. Box 2893	Lake Charles	LA	70602	337-494-4078	fdicesare@americanpress.com	www.americanpress.com
Newspaper/Daily	Online Editor		Michael	Cooper	American Press	P.O. Box 2893	Lake Charles	LA	70602	337-494-4077	mcooper@americanpress.com	www.americanpress.com
Newspaper/Daily	Business		Lance	Traweek	American Press	P.O. Box 2893	Lake Charles	LA	70602	337-494-4082	ltraweek@americanpress.com	www.americanpress.com
Newspaper/Daily	Informer column/editor		Andrew	Perzo	American Press	P.O. Box 2893	Lake Charles	LA	70602	337-494-4098,press 5	aperzo@americanpress.com	www.americanpress.com
Newspaper/Daily	Politics columnist		Jim	Beam	American Press	P.O. Box 2893	Lake Charles	LA	70602	337-433-3000	jbeam@americanpress.com	www.americanpress.com
Newspaper/Daily	Executive Editor		Crystal	Stevenson	American Press	P.O. Box 2893	Lake Charles	LA	70602	337-433-3000	cstevenson@americanpress.com	www.americanpress.com
Newspaper/Daily	Publisher		Glen	Stifflemire	Southwest Daily News	714 E. Napoleon St.	Sulphur	LA	70663	337-527-7075		www.sulphurdailynews.com
Newspaper/Daily	Editor		Marilyn	Monroe	Southwest Daily News	714 E. Napoleon St.	Sulphur	LA	70663	337-527-7075	sdneditorial@yahoo.com	www.sulphurdailynews.com
Magazine/Monthly	Assistant Editor		Katie	Harrington	Thrive	836 University Drive	Lake Charles	LA	70605	337-310-2099	edit@thriveswa.com	www.thriveswa.com
Magazine/Bi-Monthly	Executive Editor		Lauren	de Albuquerque	The Jambalaya News	715 Kirby St.	Lake Charles	LA	70601	337-436-7800	lauren@thejambalayanews.com	www.thejambalayanews.com
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MAGNOLIA LNG PROJECT

Resource Report 1

GENERAL PROJECT DESCRIPTION

Docket No: CP14-____-000
30 April 2014

Submitted by:

MAGNOLIA
LNG

Magnolia LNG, LLC
1001 McKinney, Suite 400
Houston, TX 77002

Prepared by:



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SUMMARY OF FILING INFORMATION	
INFORMATION	SECTION REFERENCE
Minimum Filing Requirements	
<input checked="" type="checkbox"/> 1. Provide a detailed description and location map of the project facilities (§380.12(c)(1)) <ul style="list-style-type: none"> • Include all pipeline and aboveground facilities. • Include support areas for construction or operation. • Identify facilities to be abandoned. 	Section 1.1 Section 1.3 Section 1.8
<input checked="" type="checkbox"/> 2. Describe any non-jurisdictional facilities that would be built in association with the project (§ 380.12(c)(2)) <ul style="list-style-type: none"> • Include auxiliary facilities (See § 2.55(a)). • Describe the relationship to the jurisdictional facilities. • Include ownership, land requirements, gas consumption, megawatt size, construction status, and an update of the latest status of federal, state, and local permits/approvals. • Include the length and diameter of any interconnecting pipeline. • Apply the four-factor test to each facility. (see § 380.12(c)(2)(ii)) 	Section 1.12
<input checked="" type="checkbox"/> 3. Provide current, original United States Geological Survey (USGS) 7.5-minute series topographic maps with mileposts showing the project facilities (§ 380.12(c)(3)) <ul style="list-style-type: none"> • Maps of equivalent details are acceptable if legible (check with staff). • Show locations of all linear project elements, and label them. • Show locations of all significant aboveground facilities, and label them. 	Appendix 1.A
<input checked="" type="checkbox"/> 4. Provide aerial images or photographs or alignment sheets based on these sources with mileposts showing the project facilities. (§ 380.12(c)(3)) <ul style="list-style-type: none"> • No more than 1-year old • Scale no smaller than 1:6,000 	Appendix 1.B

SUMMARY OF FILING INFORMATION	
INFORMATION	SECTION REFERENCE
Minimum Filing Requirements	
<input checked="" type="checkbox"/> 5. Provide plot/site plans of compressor stations showing the location of the nearest noise-sensitive areas (NSA) within 1 mile. (§ 380.12(c)(3,4)) <ul style="list-style-type: none"> • Scale no smaller than 1:3,600 • Show reference to topographic maps and aerial alignments provided above. 	There are no compressor stations included as part of the proposed Magnolia LNG Project; however, one will be required as part of the transportation of feed gas to the Project as explained in Section 1.13.
<input checked="" type="checkbox"/> 6. Describe construction and restoration methods. (§ 380.12(c)(6))	Section 1.5
<input checked="" type="checkbox"/> 7. Identify the permits required for construction across surface waters. (§ 380.12(c)(9)) <ul style="list-style-type: none"> • Include the status of all permits. • For construction in the federal offshore area be sure to include consultation with BOEM. • File with the BOEM for rights-of-way grants at the same time or before you file with the FERC. 	Section 1.10 Appendix 1.E
<input checked="" type="checkbox"/> 8. Provide the names and addresses of all affected landowners as required and certify that all affected landowners would be notified. <ul style="list-style-type: none"> • Affected landowners are defined in § 157.6(d)(2). • Provide an electronic copy directly to the environmental staff. 	Appendix 1.F <i>[Privileged]</i>
Additional Information Often Missing and Resulting in Data Requests	
<input checked="" type="checkbox"/> Describe all authorizations required to complete the proposed action and the status of applications for such authorizations.	Section 1.10 Appendix 1.E
<input checked="" type="checkbox"/> Provide plot/site plans of all other aboveground facilities that are not completely within the right-of-way	Section 1.3, Figures 1.3-1 through 1.3-3
<input type="checkbox"/> Provide detailed typical construction right-of-way cross-section diagrams showing information such as widths and relative locations of existing rights-of-way, new permanent rights-of-way, and temporary construction rights-of-way. See Resource Report 8 – Land Use, Recreation, and Aesthetics.	Not applicable
<input checked="" type="checkbox"/> Summarize the total acreage of land affected by construction and operation of the project.	Section 1.3

SUMMARY OF FILING INFORMATION	
INFORMATION	SECTION REFERENCE
Minimum Filing Requirements	
<input checked="" type="checkbox"/> If Resource Report 5 - Socioeconomics is not provided, provide the start and end dates of construction, the number of pipeline spreads that would be used, and the workforce per spread.	RR 5 is included in this filing; <i>also see</i> Section 1.5 and Appendix 1.D
<input checked="" type="checkbox"/> Send two (2) additional copies of topographic maps and aerial images/photographs directly to the environmental staff of the Office of Energy Projects	Included with this submittal

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Appendix 1.C: Real Estate Lease Option Agreements

1.C.1 Port District Option Agreement

1.C.2 BG LNG Option Agreement

1.C.3 Amendment to the Port District Option Agreement

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Appendix 1.E: Permits and Approvals for the Project

Appendix 1.F: List of Landowners for the Project *[PRIVILEGED]*

Appendix 1.G: Federal, State, Local, Business, and Other Stakeholders

ACRONYMS AND ABBREVIATIONS

9% Ni	9-percent nickel
°C	degrees Celsius
°F	degrees Fahrenheit
AEO	Annual Energy Outlook
ANR	ANR Pipeline Company
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
Bcf	billion cubic feet
BMP	best management practice
BOG	boil-off gas
Bscf/d	billion standard cubic feet per day
BTEX	benzene, toluene, ethylbenzene and xylenes
Btu/ft ² -hr	British thermal units per square foot per hour
CCTV	closed circuit television
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulations
CGT	Columbia Gulf Transmission
CHP	combined heat and power
CIK	core in kettle
CO ₂	carbon dioxide
DII	Dynamic Industries, Inc.
DOE	(United States) Department of Energy
Dth/d	dekatherms per day
ECA	Emissions Control Area
EIA	Energy Information Administration
EPC	engineering, procurement, and construction
ERC	emergency release coupler
ESD	emergency shutdown
KMLP's Eunice C/S	Kinder Morgan Louisiana Pipeline's new compressor station to be located near Eunice, Louisiana

FEED	Front-End Engineering Design
FERC	Federal Energy Regulatory Commission or Commission
FTA	Free Trade Agreement
GE	General Electric
GTL	gas-to-liquid
H ₂ O	water
HP	high pressure
HV	high voltage
IMO	International Maritime Organization
KMLP	Kinder Morgan Louisiana Pipeline
kV	kilovolt(s)
LA	Louisiana
LAC	Louisiana Administrative Code
LCZ	Louisiana Coastal Zone
LDEQ	Louisiana Department of Environmental Quality
LDNR	Louisiana Department of Natural Resources
LDWF	Louisiana Department of Wildlife and Fisheries
LED	Louisiana Economic Development
LLC	Limited Liability Corporation
LNG	liquefied natural gas
LP	low pressure
LPDES	Louisiana Pollutant Discharge Elimination System
m ³	cubic meters
m ³ /hr	cubic meters per hour
Magnolia	Magnolia LNG, LLC
MARPOL 73/78	International Maritime Organization (IMO) Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978
MLG	mean low gulf
MR	mixed refrigerant
MSU	Marine Safety Unit

mtpa	million (metric) tonnes per annum
MW	megawatt(s)
N ₂	nitrogen
NAVD88	North American Vertical Datum of 1988
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NGA	Natural Gas Act
NPDES	National Pollutant Discharge Elimination System
O&M	operation and maintenance
OEP	Operations Execution Plan
OSMR [®]	Optimized Single Mixed Refrigerant
OSV	offshore supply vessel
OTSG	once-through steam generator
OWI	oily water interceptor
PF	Pre-Filing
PHMSA	Pipeline and Hazardous Materials Safety Administration
Plan	Project-specific Upland Erosion Control, Revegetation, and Maintenance Plan
Port District	Lake Charles Harbor & Terminal District
ppm	parts per million
Procedures	Project-specific Wetland and Waterbody Construction and Mitigation Procedures
psia	pounds per square inch (absolute)
psig	pounds per square inch (gauge)
ROW	right-of-way
RR	Resource Report
SHPO	State Historic Preservation Officer
SMR	single mixed refrigerant
SPMT	self-propelled modular transporter
SWPPP	stormwater pollution prevention plan
Tcf	trillion cubic feet

TGT	Texas Gas Transmission
TMDL	total maximum daily load
Trunkline LNG project	Trunkline LNG, LLC, Lake Charles Export Terminal
U.S.	United States
UPS	uninterruptible power supply; <i>also</i> United Parcel Service
USACE	United States Army Corps of Engineers
USCG	United States Coast Guard
USDOT	(United States) Department of Transportation
USEPA	United States Environmental Protection Agency
VHF	very high frequency
WQC	Water Quality Certification
WSA	Waterway Suitability Assessment

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1 GENERAL PROJECT DESCRIPTION

Magnolia LNG, LLC (Magnolia) has prepared this Resource Report (RR) 1 in compliance with the requirements of the Federal Energy Regulatory Commission (FERC or the Commission) regulations for authorization under Section 3(a) of the Natural Gas Act (NGA) to site, construct and operate facilities necessary to liquefy natural gas at a proposed site in Lake Charles, Louisiana. On March 12, 2013, Magnolia requested approval to participate in the FERC Pre-Filing Process to assist in the identification and proper assessment of issues and to provide input into the development of the environmental resource reports. The FERC granted this request on March 20, 2013, and assigned Pre-Filing (PF) Docket Number PF13-9-000.

This RR 1 provides a description of the proposed Magnolia LNG Project (referred to herein as the Project) and its purpose and need, both from a regional and a national perspective, as well as a specific description of the Project facilities and certain non-jurisdictional facilities. The proposed construction schedule, land requirements, operation, maintenance, and safety procedures for the Project are also addressed in this RR.

Additionally, this RR 1 provides a discussion about cumulative impacts. Cumulative impacts are the collective result of the incremental impacts of an action that, when added to the impacts of other past, present, and reasonably foreseeable future actions, would affect the same resources, regardless of what agency or person undertakes those actions (40 Code of Federal Regulations [CFR] 1508.7). These include (but are not limited to) actions under analysis by a regulatory agency, proposals being considered by state or local planners, plans that have begun implementation, or future actions that have been funded.

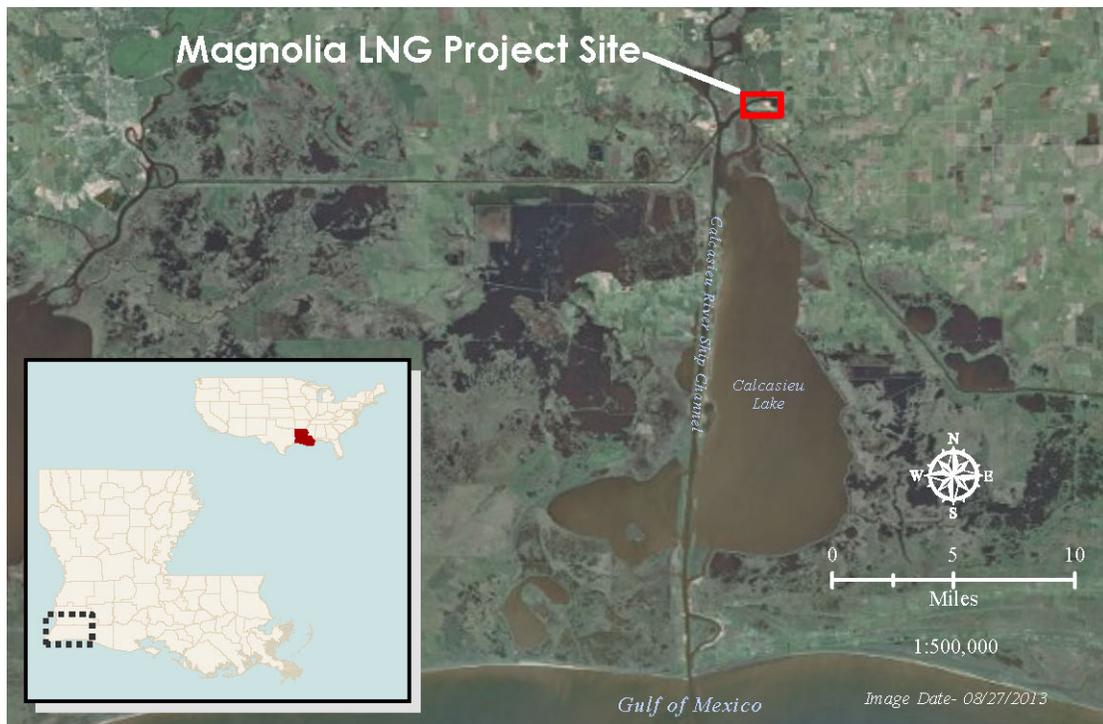
Lastly, RR 1 provides an update of the applicable regulatory approvals and coordination with the respective federal, state, and local agencies.

1.1 PROPOSED FACILITIES

Magnolia is proposing to develop a liquefied natural gas (LNG) facility capable of producing a nominal capacity of approximately 8.0 million (metric) tonnes per annum (mtpa) of LNG using its highly efficient and patented Optimized Single Mixed Refrigerant (OSMR[®]) technology. The Project would receive natural gas via a tie-in to an existing interstate pipeline that traverses the proposed Project site. The natural gas would be treated, liquefied, and stored on-site in two full containment LNG storage tanks with a net pumpable capacity of approximately 160,000 cubic meters (m³) of LNG each. At full plant capacity, the Project would consist of four LNG trains each with a nominal capacity of 2.0 mtpa of LNG (total nominal capacity of approximately 8.0 mtpa). The LNG would be loaded onto LNG carriers for export overseas; LNG carriers and barges for domestic marine distribution and the possibility of LNG bunkering; and LNG trucks for road distribution to LNG refueling stations in Louisiana and the

surrounding states. The Project site is well-positioned to provide access for loading of LNG carriers and also for potential LNG barges and LNG trucks.¹

The Project would be located on the south shore of the Industrial Canal on the Port of Lake Charles Tract 475, an approximately 115-acre parcel of land in Calcasieu Parish, south of Lake Charles, Louisiana. The Industrial Canal is located off the main Calcasieu River Ship Channel. The Project would be located in an area zoned for heavy industrial use and would be consistent with other industrial facilities along the shoreline. The coordinates of the proposed Project site are as follows: Latitude: 30° 06' 20.30" N; Longitude: 93° 17'54.00" W. Figure 1.1-1 is a general location map of the Project (also see Appendices 1.A and 1.B).



¹ LNG highway transportation refueling stations generally receive their LNG supply from a liquefaction plant via LNG trucks specially designed to distribute cryogenic fuels. At the refueling site, LNG is offloaded into the facility's storage system. To support long-haul, heavy-duty trucks moving goods throughout the United States, LNG truck fueling stations along major interstate corridors are required.

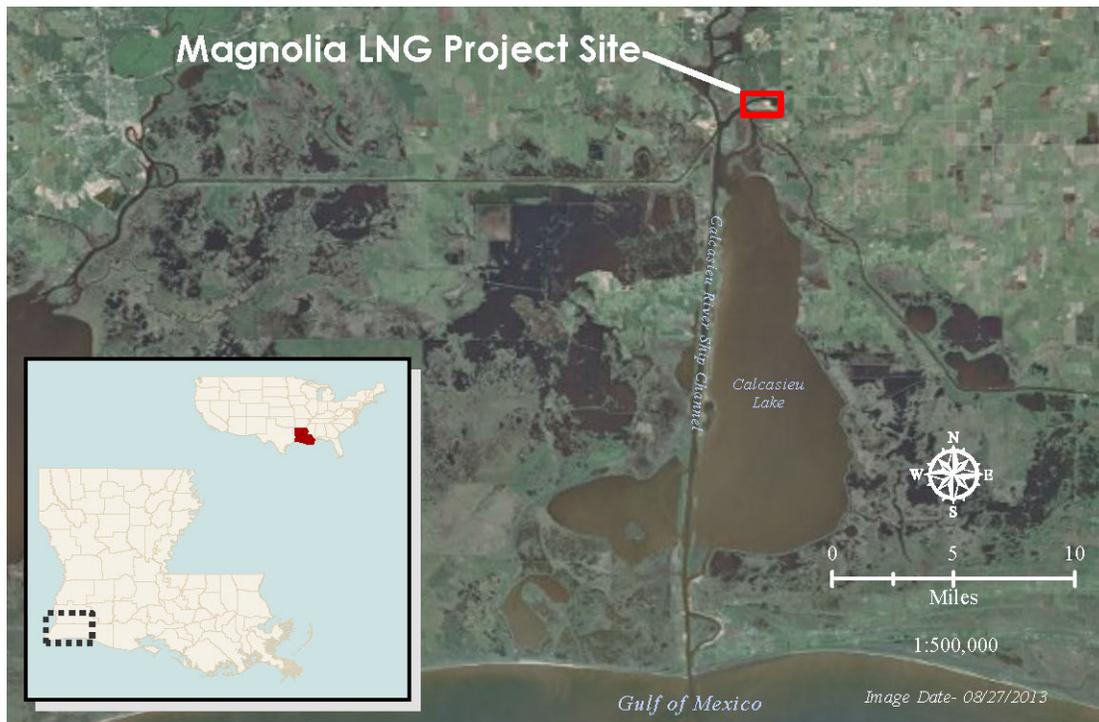


Figure 1.1-1 General Location Map of the Magnolia LNG Project

On March 6, 2013, Magnolia signed an exclusive and binding four-year Real Estate Lease Option Agreement with the Lake Charles Harbor & Terminal District (Port District) for approximately 107.59 acres of the approximately 115-acre Project site (see Port District Option Agreement, in Appendix 1.C.1). The Port District Option Agreement includes a clause for a 30-year-term ground lease option with the right to extend the lease term for four periods of 10 years each for a total of 70 years. Subject to compliance with the terms of the Port District Option Agreement, Magnolia may exercise the option and enter into the ground lease with the Port District at any time.

On September 26, 2013, Magnolia signed an exclusive and binding four-year Real Estate Lease Option Agreement with BG LNG Services, LLC, for approximately 5.74 acres of the approximately 115-acre Project site (see Appendix 1.C.2). On October 21, 2013, Magnolia signed the First Amendment to the Port District Option Agreement (see Appendix 1.C.3) for an additional area of approximately 1.99 acres. These two agreements are on similar terms and conditions as the initial Port District Option Agreement.

Through the combination of the Port District Option Agreement, the BG LNG Option Agreement, and the First Amendment to the Port District Option Agreement, Magnolia will have control of the entire area comprising the approximately 115-acre Project site for at least the minimum expected operational life of the Project, which is 30 years, with the right to extend the lease term. Figure 1.1-2 shows the boundary of the total leased area.

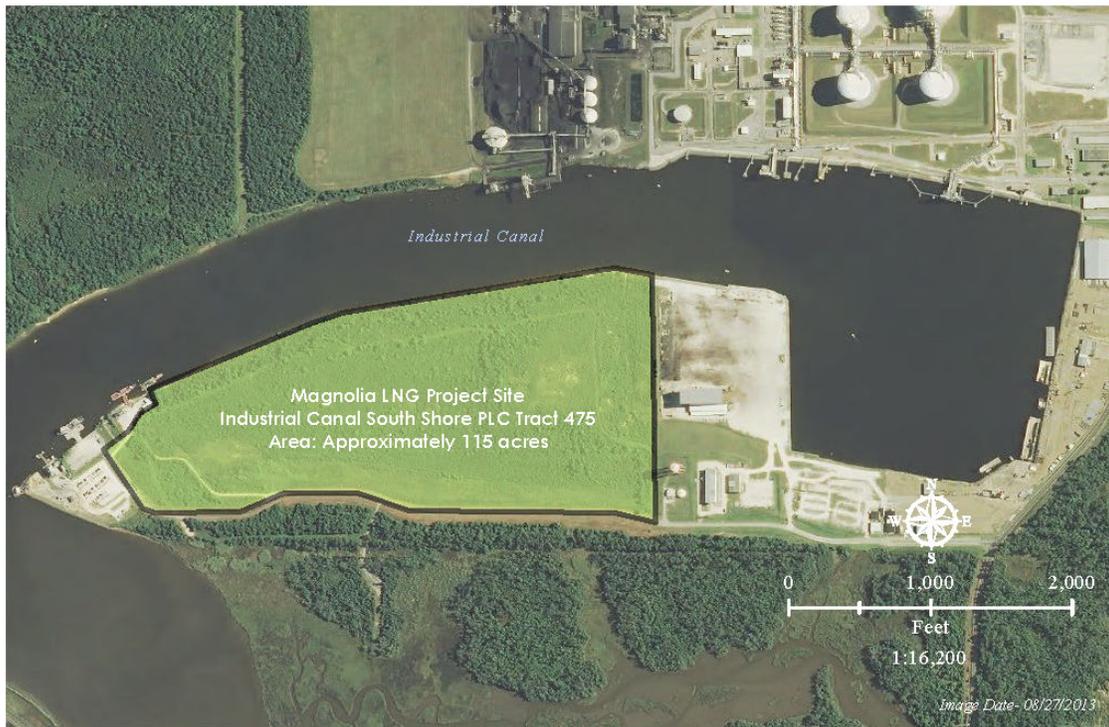


Figure 1.1-2 Project Site Boundary Map

Figure 1.1-3 is a more detailed map of the proposed Magnolia LNG Project site and the waterway system along the Calcasieu River Ship Channel, in the vicinity of Choupique Island, and the Intracoastal Waterway area to the Devil's Elbow section of the Calcasieu River. The figure also shows the locations of Trunkline LNG, Cameron LNG, and the proposed G2X Energy plant relative to the Project site. Additionally, the Calcasieu Point Landing public boat ramp and facilities (see inset on Figure 1.1-3) are located west of the Project site at the end of Henry Pugh Boulevard (3955 Henry Pugh Boulevard, Lake Charles, Louisiana). Park amenities include: (1) a three-lane public boat ramp that allows access to the Industrial Canal and Gulf Intracoastal Waterway, (2) a fishing pier on the Industrial Canal, (3) a full-service store within the park offering snacks and beverages, and (4) public restrooms.

The proposed Louisiana Marine Fisheries Enhancement, Research, and Science Center is planned immediately southeast of the Project site (see Figure 1.1-4). The main function of this center will be for the research and enhancement of marine fisheries and for the long-term monitoring of the fishery resource. This facility will include a laboratory, a library, a visitor complex to provide education on fisheries and restoration programs, and a recreational fishing pond. A meeting complex/dormitory for staff and visiting researchers also is planned. The hatchery facility will be focused on the production of spotted seatrout, red drum, and southern flounder. There will be three 0.5-acre ponds for propagation and research, a water reservoir with

pipeline and water intake station, and an effluent pump station² (see Figure 1.1-4). Refer to Section 1.9, “Cumulative Impacts,” for an illustration of other existing and proposed facilities in the Project vicinity.

² Email from Duet, J., Biologist Director, Louisiana Department of Wildlife and Fisheries, Fisheries Extension, to W. Daughdrill, Ecology and Environment, Inc. (July 24, 2013).

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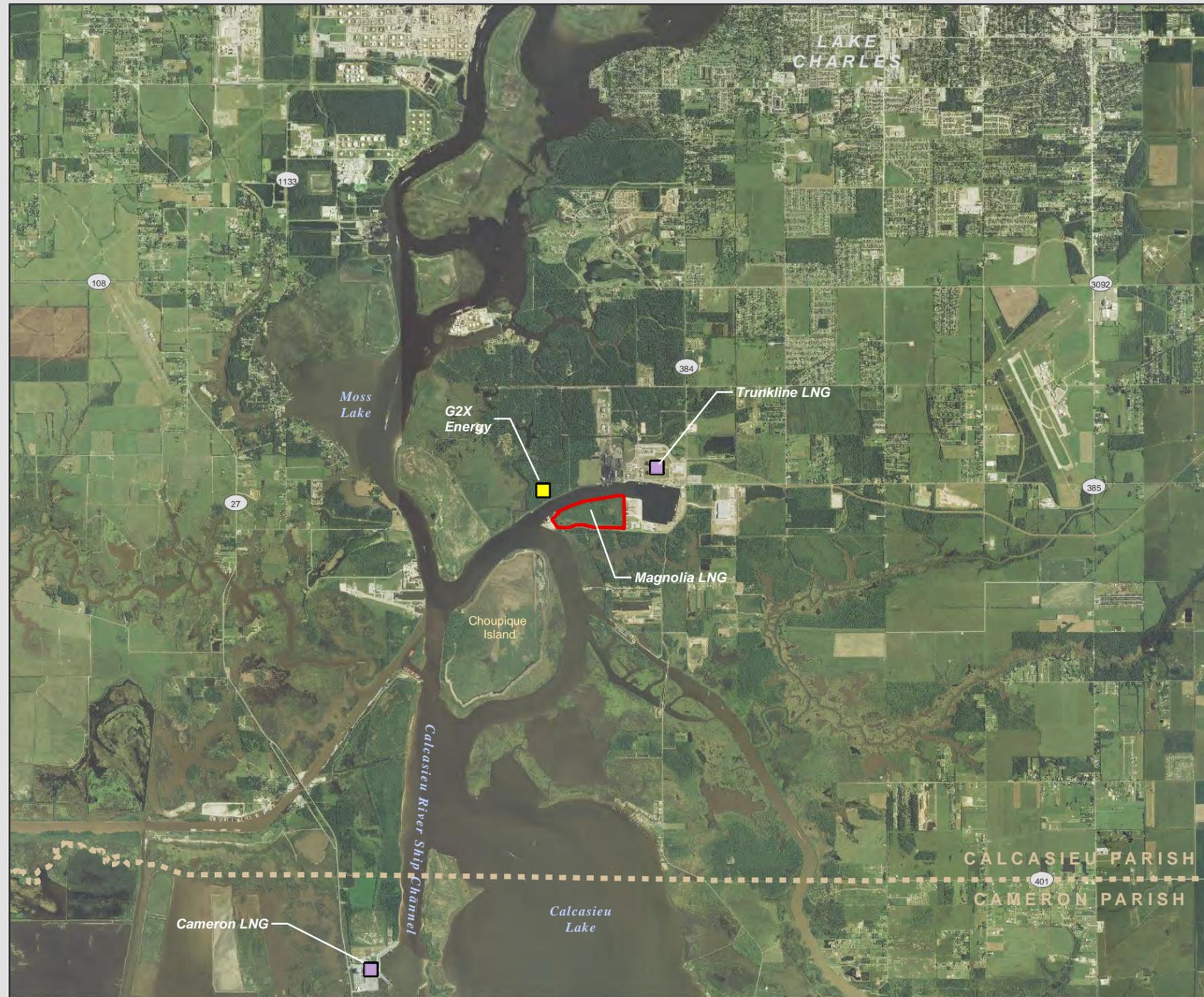
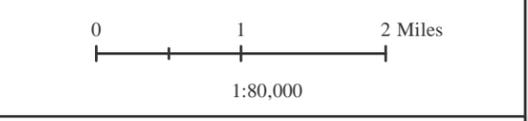


Figure 1.1-3
Waterway System in the Vicinity of
Choupique Island and Along the
Calcasieu River Ship Channel Facilities
 Magnolia LNG
 Calcasieu Parish, Louisiana

- Legend**
- Proposed LNG Facility Boundary
 - Parish Boundary
 - Existing LNG with Proposed Expansion
 - Major Highway
 - G2X Energy



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 Image Date- 08/27/2013
 Date: 4/28/2014

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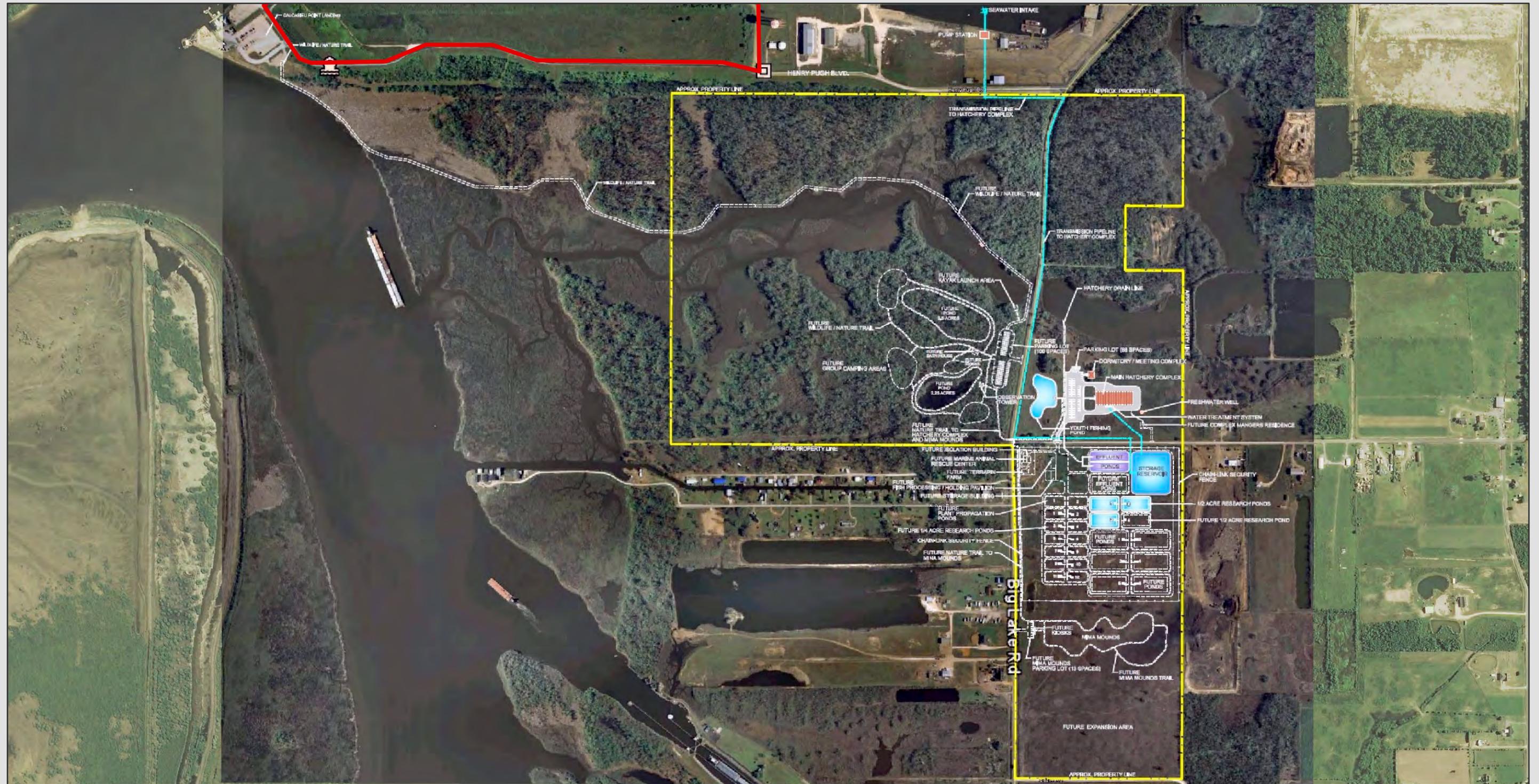
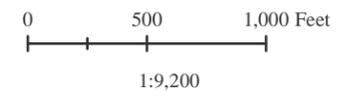


Figure 1.1-4
Proposed Louisiana Department Wildlife and Fisheries Research Center Layout
 Magnolia LNG
 Calcasieu Parish, Louisiana

Legend
 Proposed LNG Facility Boundary

 Proposed Louisiana Department Wildlife and Fisheries Research Center Layout



Source- ESRI 2011, LDWF 2013
 Image Date- 08/27/2013
 Date: 4/27/2014

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For the purposes of this RR 1, the FERC jurisdictional facilities for the Magnolia LNG Project site can be broken down into the following Project facilities:

- Gas Gate Station and Interconnect Pipeline
- LNG Trains
- LNG Storage
- LNG Vessel Loading
- LNG Truck Loading
- Flare Stacks
- Demineralized Water Treatment Plant
- Facility Drainage and Containment
- Control, Administration, and Workshop Buildings
- Power, Water, and Communications (Note that power and water also include off-site non-jurisdictional facilities leading to the Project site.)

RR 13, “Engineering and Design Material,” contains additional information on each Project component.

1.1.1 Gas Gate Station and Kinder Morgan Louisiana Pipeline Interconnect Pipeline

Feed gas would be transported to the site boundary via an existing 42-inch interstate gas pipeline owned and operated by Kinder Morgan Louisiana Pipeline (KMLP) that passes beneath the Project site near the southern boundary. The KMLP pipeline would be accessed within the Project site boundary. A short interconnect pipeline of approximately 75 feet to be located entirely within the Project site would tie-in the existing underground pipeline to the Gas Gate Station. The Gas Gate Station would include an incoming interconnect pipeline, a filter/separator, custody transfer meter(s), a pressure regulator, an emergency shutdown (ESD) valve, and a gas analyzer. The short interconnect pipeline, the Gas Gate Station, the modification of certain existing KMLP delivery meter facilities to make them bidirectional, and the installation of new compression facilities near Eunice, Louisiana, will be built, owned, and operated by KMLP and, as such, will require a separate filing by KMLP with the FERC under Section 7(c) of the NGA as explained in Section 1.13, “Transportation of Feed Gas to the Magnolia LNG Project.” A binding precedent agreement related to these facilities and up to 1.4 billion standard cubic feet per day (Bscf/d) of firm transportation on KMLP’s pipeline was executed on January 28, 2014, between KMLP and Magnolia.

1.1.2 LNG Trains

At full plant capacity, the Project would consist of four LNG trains each with a nominal capacity of 2.0 mtpa of LNG (totaling approximately 8.0 mtpa nominal capacity). At full plant capacity, approximately 1.4 Bscf/d of natural gas would be contracted for transportation to the Project site via the interstate pipeline to support Project operations. Each LNG train has a guaranteed capacity of 1.7 mtpa of LNG and a nominal capacity of 2.0 mtpa of LNG. The core of each LNG train would be a single mixed refrigerant (SMR) process. This simple SMR process is then optimized by the use of three proven technologies: aero-derivative gas turbines,

combined heat and power (CHP) technology, and ammonia auxiliary refrigeration. The integration of these proven technologies to enhance the SMR process resulted in the patented OSMR[®] process technology.

Each OSMR[®] LNG train would include the following essential facilities: an amine gas-sweetening unit (carbon dioxide [CO₂] and hydrogen sulfide removal), a dehydration and mercury removal system, a heavy hydrocarbon removal system, a fuel gas system, two mixed refrigerant (MR) circuits (each circuit comprised of an aero-derivative gas turbine, MR compressor, cold box, MR coolers, and suction scrubber), a CHP plant (comprised of a once-through-steam-generator [OTSG] located on the gas turbine exhaust, an auxiliary boiler, steam turbines, air-cooled condensers, and demineralized water treatment plant), an ammonia refrigeration plant, and plant utilities. These technologies are discussed in greater detail in Section 1.4, “Process Description.”

Each of the LNG trains’ essential facilities would include the following components:

- Gas Sweetening Unit (CO₂ and hydrogen sulfide removal)
 - amine contactor column
 - amine reboiler and regenerator
 - amine charge pump, amine reflux pump, and booster pump
 - amine reflux condenser and reflux accumulator
 - amine economizer and lean/rich amine exchanger
 - wet gas cooler
 - thermal oxidizer (for BTEX removal)
- Dehydration Unit (water [H₂O] removal):
 - molecular sieve vessels (three per LNG train)
 - regeneration gas cooler
 - regeneration gas scrubber
 - regeneration gas heater
- Dust Filter
- Mercury Guard Bed
- Fuel Gas System:
 - high pressure (HP) fuel gas knock-out drum
 - low pressure (LP) fuel gas knock-out drum
 - HP fuel gas heater
 - LP fuel gas heater
- Two MR Circuits. Each MR circuit would contain:
 - cold box (brazed aluminum heat exchanger)
 - MR pre-cooler (core in kettle [CIK] exchanger)
 - MR compressor

- gas turbine
- inlet air chiller
- MR suction scrubber
- MR cooler
- heavy hydrocarbon removal system

- Ammonia Refrigeration Plant:
 - steam turbine-driven ammonia compressors (two per LNG train)
 - ammonia suction scrubber (two per LNG train)
 - ammonia condensers
 - ammonia liquid receiver
 - HP ammonia receiver

- CHP Plant:
 - OTSG connected to each gas turbine exhaust
 - two condensing steam turbines, each driving an ammonia compressor
 - steam desuperheater (two per LNG train)
 - air-cooled condensers (two per LNG train)
 - deareator
 - condensate drums and condensate pumps for the ammonia compressor drives
 - boiler feed water pumps (two per LNG train)
 - auxiliary boiler

- Plant Utilities:
 - instrument air package
 - instrument air receiver
 - nitrogen (N₂) package
 - N₂ receiver
 - fresh water tank and pumps
 - demineralized water treatment plant
 - demineralized water storage tank
 - demineralized water pumps
 - treated water storage tanks
 - treated water pumps
 - chemical injection system
 - analyzers

- Fire and Gas Detection and Protection System (see Section 1.7, “Safety”)

For information regarding atmospheric emissions of hydrogen sulfide and CO₂ from the amine gas-sweetening unit and heavy hydrocarbons from the heavy hydrocarbon removal system, please refer to RR 9, “Air Quality and Noise,” Section 9.2.6.1 “Emission Estimates.” Permitting of atmospheric emissions is delegated to the Louisiana Department of Environmental Quality (LDEQ) through the federal Title V operating permit program.

Regarding the volumes of mercury generated from the mercury removal unit, it is anticipated that, on average, less than 2 kilograms per train would be generated every 15 years. The mercury generated would be removed from the Magnolia LNG facility by a third-party licensed contractor and disposed off-site at a licensed hazardous waste facility. To remove the mercury, non-regenerative mercury guard beds would be used (please refer to RR 13, “Engineering and Design Material,” Section 13.1.6.1). Approximately 26,000 pounds of adsorbent material per train would be used and replenished every 15 years. A specialized third-party contractor approved by the adsorbent vendor would be used for loading and unloading services. Mercury to be generated by Magnolia LNG would meet the United States Environmental Protection Agency (USEPA) waste Code U151, CAS 7439-97-6 specifications, and the Magnolia LNG facility would be a conditionally exempt small quantity generator as defined in the Louisiana Administrative Code, Title 33 Part V (LAC 33:V), Chapter 1 (§108. Special Requirements for Hazardous Waste Generated by Conditionally Exempt Small Quantity Generators, page 19).

1.1.3 LNG Storage

Two full containment LNG storage tanks each with a net pumpable capacity of approximately 160,000 m³ would store the LNG product from LNG trains 1 through 4. The LNG storage tanks would be full-containment type, consisting of double-wall construction, with an inner wall being of low-temperature 9-percent nickel (9% Ni) steel and the outer wall of reinforced post-tensioned concrete. The LNG storage tanks would be designed to meet the requirements of National Fire Protection Association (NFPA) Standard 59A, regulations of the United States Department of Transportation (USDOT) Pipeline and Hazardous Materials Safety Administration (PHMSA) at 49 CFR Part 193, and other applicable standards.

Each LNG storage tank would have the following features:

- inner wall (primary containment): 9% Ni steel
- outer wall (secondary containment): Reinforced post-tensioned concrete with a steel liner
- reinforced concrete domed roof, supporting insulated deck, LNG pumps and tank top LNG and vapor pipework
- an insulated aluminum deck over the inner containment suspended from the outer containment roof
- submerged motor pumps located in vertical pump caissons and supported by a structure attached to the roof and walls
- base heating system
- pressure, level and temperature instrumentation, including monitoring of tank cool-down
- pressure and vacuum relief systems
- nozzles and internal pipework including two-phase inlet, top cool-down spray
- all nozzle penetrations through the roof
- N₂ purge and gas detection system for wall and floor insulation space
- roof platforms, walkways, and pipe supports

- external stairways, ladder, and pipe supports

The LNG storage tanks are designed and would be constructed so that the self-supporting 9 percent Ni steel primary containment and the concrete secondary containment would be capable of independently containing the LNG. The 9 percent Ni steel primary containment would contain the LNG under normal operating conditions. The concrete secondary containment is designed to be capable of containing 110 percent of the capacity of the inner tank. Furthermore, an earthen berm would be constructed around both of the LNG storage tanks and would have a minimum containment capacity equal to the gross volume of one LNG tank, which is 167,600 m³. A proposed site plan showing the location of the proposed LNG storage tanks in relation to other Project facilities is shown on Figure 1.1-5.

1.1.4 LNG Vessel Loading

To accommodate LNG vessels and to minimize interference with existing canal traffic, the LNG vessel loading facility is planned to be recessed into the northern boundary of the site (see Figure 1.1-6). The following components are included as part of the LNG vessel loading facility.

- A single LNG vessel loading facility complete with:
 - LNG cryogenic loading line of nominal 30-inch size (outside diameter of 32 inches; pipe schedule 10S, with a wall thickness of 0.31 inches) from the LNG storage tank
 - three 16-inch LNG loading arms
 - one 16-inch vapor return arm
 - one 8-inch loading arm with piggy back 6-inch vapor return line for LNG barges
 - electro-hydraulic control system
- Each arm is equipped with:
 - a hydraulic quick connect/disconnect coupler
 - a hydraulic double ball valve emergency release coupler
 - swivel joints with N₂ purge;
 - mechanical locking device for arm stowing
 - N₂ purge and drain connections
 - Breasting dolphins and mooring dolphins
 - Standby tug and security/support vessels mooring area

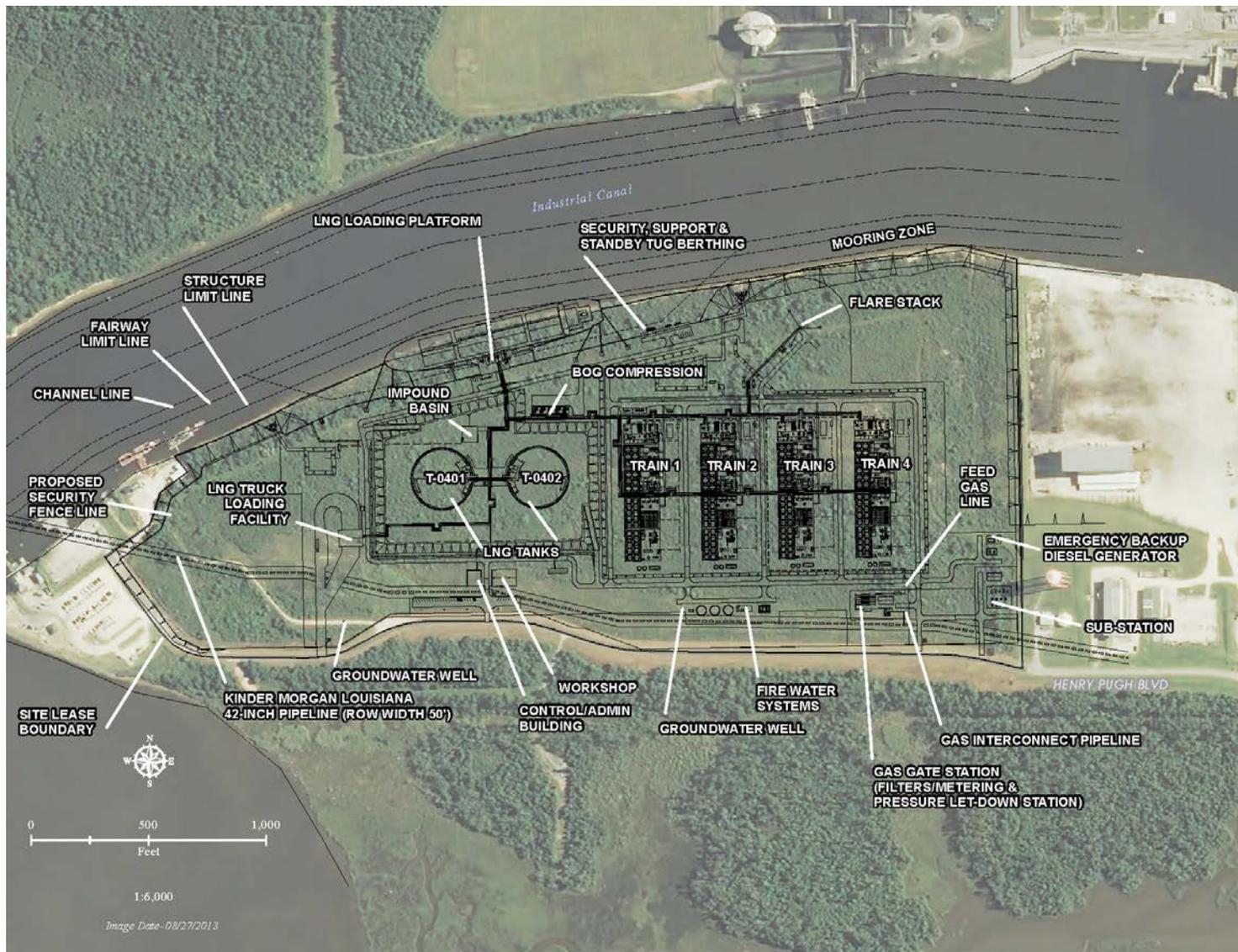


Figure 1.1-5 Proposed Site Plan

The berth size, location, and orientation is designed to optimize a number of criteria, primarily to ensure safe navigable approach and departure conditions, a safe mooring environment, proximity to the channel, and safe distance from the influence of passing vessels. Other influences include water depth and optimization of the cryogenic piping arrangement. To achieve the maximum 10,000 cubic meters per hour (m³/hr) loading rate for LNG vessels, the main cryogenic LNG line from the LNG storage tanks to the loading platform would be nominally sized at 30 inches. The LNG loading platform would support three 16-inch LNG loading arms, and one 16-inch vapor return arm for loading the LNG carriers, and one 8-inch LNG loading arm with a piggyback mounted 6-inch vapor return arm for loading LNG barges.

The total volume of material to be excavated and dredged (from a 16.20-acre proposed LNG basin area) to construct the recessed berthing area and waterway access is approximately 993,750 cubic yards. The final calculated dredging volume and the dredging plan will be developed in accordance with the relevant guidelines and in coordination with the Port of Lake Charles and in compliance with the requirements of the United States Army Corps of Engineers (USACE).

According to the Lake Charles Pilots Association,³ approximately 1,000 vessels call on the Port of Lake Charles annually (as of 2012), equating to 1,000 inbound transits, 1,000 outbound transits, and numerous intra-port vessel shifts. The Project is being designed with new berthing and mooring configurations to accommodate LNG carriers and LNG barges. Current layout for the Project provides an additional breasting dolphin to cover the smaller capacity LNG vessels and barges; this breasting dolphin would be located in front of the LNG loading platform to ensure contact on the flat panel of the smaller vessels when spotted across from the dedicated combination LNG liquid arm and vapor line. Magnolia intends to use a dedicated all-metal articulated LNG liquid arm with a vapor return line mounted piggyback on the liquid arm for this service. Both the LNG arm and vapor line would be equipped with a double-ball valve-powered emergency release system to provide near dry break disconnection of the arm and vapor line from the LNG barge in the event of over travel or another emergency. Other operating and control equipment would be the same as that installed on the 16-inch-diameter LNG arms for the larger capacity LNG carriers. Please refer to RR 13, "Engineering and Design Materials," for detailed marine design drawings and information. The marine facilities basis of design is contained in RR13 in Appendix C.5 and the marine design drawings are contained in Appendix K (Critical Energy Infrastructure Information [CEII]) of that resource report.

³ In person communication, Captain Brett Palmer, Vice President, Lake Charles Pilots (Jan. 23, 2013).

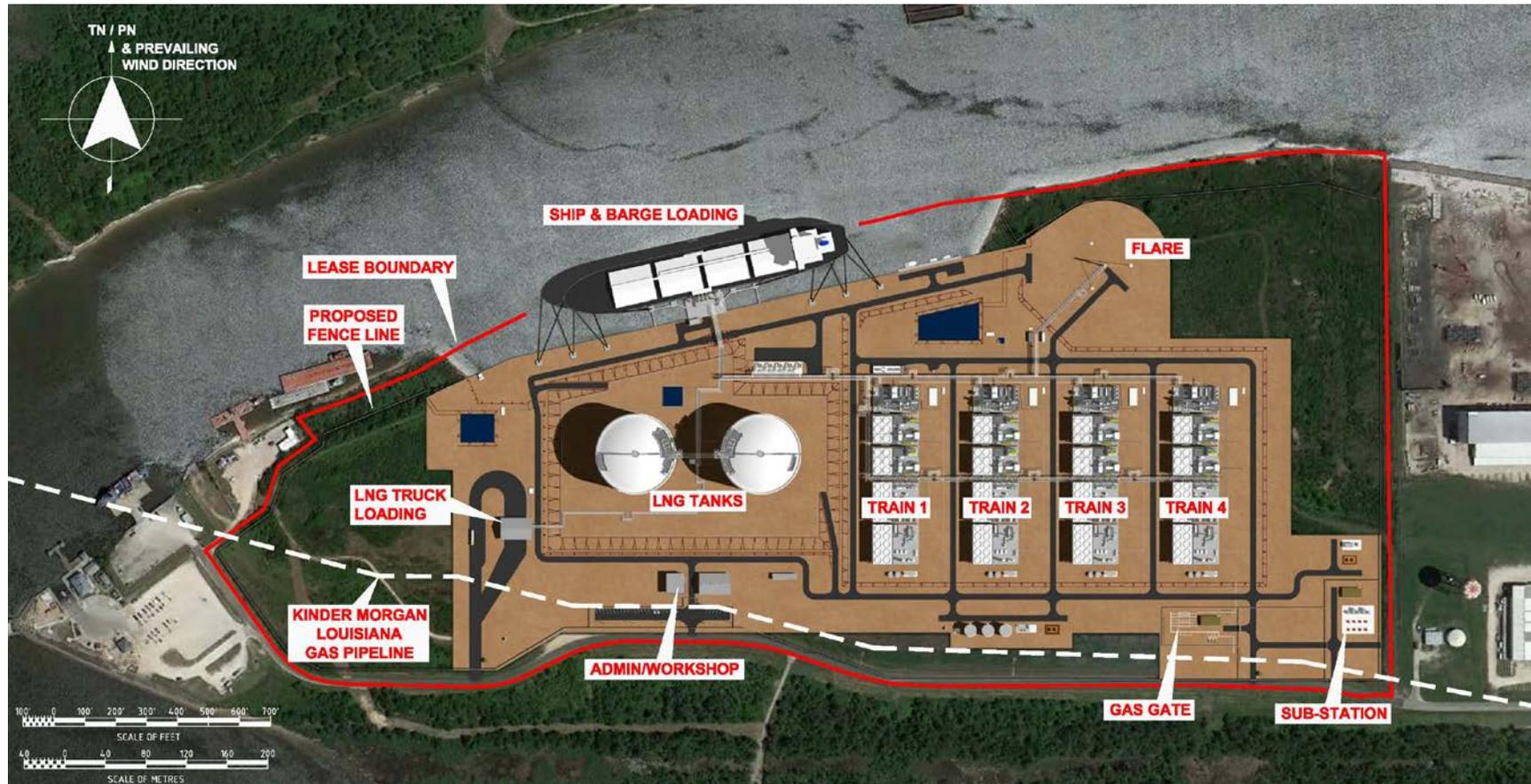


Figure 1.1-6 Artist's Rendering of Proposed Facility Layout

Initially, the Project is expected to utilize LNG carrier capacities of up to 180,000 m³; however, berthing and mooring configurations would be able to accommodate LNG carriers with capacities between 125,000 and 218,000 m³ (LNG-Flex), as well as the LNG barges with capacities of approximately 15,000 m³. It is currently projected that, on average, one to two LNG carriers per week and an additional one to two LNG barges per week would make port calls at the Project terminal when operating at full plant capacity. Current projections of port call frequency are based on the maximum nominal LNG output of 8 mtpa and typical carrier and barge sizes. The actual number of port calls per week will be determined by contracts that are subsequently executed and the capacity of the specific LNG carriers and LNG barges used.

The maximum number of LNG carrier and LNG barge transits per year will be determined by the United States Coast Guard (USCG) as part of the Waterway Suitability Assessment (WSA) process. At this time, Magnolia projects that LNG barge port calls would not begin until after Train 2 is commissioned. This projected number of port calls is based on potential LNG output alone at full plant capacity and does not reflect specific knowledge of anticipated customer requirements.

1.1.5 LNG Vessel Routes

LNG carriers calling at the Magnolia LNG terminal would transit into the Gulf of Mexico via the Straits of Florida (between the Florida Keys and Cuba) or the Yucatan Channel (between the western end of Cuba and Mexico). Figure 1.1-7 depicts potential routes of LNG carriers transiting to or from the Magnolia LNG terminal from the U.S. Outer Continental Shelf (OCS). These vessels would likely transit the OCS as shown on Figure 1.1-7 en route to the southern terminus of the Sabine Pass Safety Fairway (see 33 CFR 166.200(d)(12)). Safety fairways are designated by the USCG to control the erection of structures to provide safe approaches through oil fields in the Gulf of Mexico to entrances to the major ports along the Gulf Coast. Within these safety fairways, no artificial islands or fixed structures (such as oil or natural gas platforms or wells) are permitted to be erected, minimizing the risk of accidents and pollution from ship collision or platform allision.

After transiting north-northwest within the Sabine Pass Safety Fairway, inbound LNG carriers would enter the southern entrance to the Calcasieu Pass Safety Fairway (see 33 CFR 166.200(d)(15)). Inbound LNG carriers would continue north within the limits of the Calcasieu Pass Safety Fairway to the entrance of the Calcasieu Ship Channel located approximately 26 nautical miles offshore from Calcasieu Pass in the Gulf of Mexico. Magnolia's tolling parties and shipping off-takers would likely utilize these designated safety fairways both inbound and outbound from the Magnolia LNG terminal. *U.S. Coast Pilot*, Volume 5, Chapter 9, recommends that ships approach Calcasieu Pass through the prescribed safety fairways (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, and National Ocean Service 2014).

In the northern portion of the Calcasieu Pass Safety Fairway, inbound LNG carriers would embark a Lake Charles Pilot and enter the Calcasieu Ship Channel at buoy CC (29° 20' 01" N, 93° 13' 18" W). From this point, deep-draft LNG carriers are confined to the Calcasieu Ship Channel because of surrounding shallow water depths. Inbound ships would proceed into

the entrance of the Calcasieu Jetties (29° 44.7' N, 93° 20.5 W) and continue northbound in the Calcasieu River Ship Channel to the channel's intersection with the Gulf Intracoastal Waterway at "Devil's Elbow" (30° 05.5' N., 93° 19.5 W.) At this intersection, inbound LNG carriers would make a turn to the northeast and proceed into the Industrial Canal where the ships would moor at the Magnolia LNG terminal. The entire inbound route is depicted on Figure 1.1-7. Inbound LNG carriers would be either empty, partially loaded, or in heel (a small amount of residual LNG on board to maintain cryogenic temperatures within the cargo tanks).

Loaded LNG carriers would transit outbound along the reverse route described for inbound ships. LNG carriers serving the Magnolia LNG terminal are anticipated to arrive from numerous worldwide locations and, similarly, will serve natural gas markets in Europe, Asia, South America, and the Caribbean. It should be noted that Magnolia would not own or charter the LNG carriers calling at the terminal and would not control the inbound or outbound routing of these vessels. Vessel routes in offshore waters may vary from that described above due to owner/charterer routing instructions or voyage-specific safety considerations. LNG barges with a capacity up to 15,000 m³ would also transit inbound and outbound from the Magnolia LNG terminal using these same channels and safety fairways. These well-established routes are described in *U.S. Coast Pilot 5*, Chapter 9, including recommended routes between U.S. Gulf Coast ports (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, and National Ocean Service 2014).

1.1.6 LNG Vessel and Facility Security

LNG vessels transiting the Calcasieu River and Ship Channel are typically designated to have a moving security zone during transit per USCG regulations at 33 CFR 165.805(a)(2). While in transit, LNG vessels are accompanied by a moving security zone that extends 2 miles ahead, 1 mile astern, and from shoreline to shoreline on the Calcasieu River (and from channel edge to channel edge in the offshore waters of the Calcasieu Ship Channel). As a safety and security precaution, no vessels are allowed to meet, cross, or overtake LNG ships in transit or otherwise enter the security zone without the express permission of the USCG. At its discretion, the USCG may elect to provide escort boats during LNG carrier transits to enforce the moving security zone.

Magnolia plans to request that the USCG establish a fixed security zone immediately surrounding the Magnolia LNG terminal. The security zone would serve to keep unauthorized vessels from approaching close to the Magnolia LNG terminal or to LNG carriers moored at the facility. The security zone would serve a similar function to the existing security zones established at 33 CFR 165.805(a)(1) for the nearby Trunkline LNG, LLC and Cameron LNG, LLC, terminals. The size and orientation of this security zone would be coordinated with the USCG to ensure that it would not interfere with passing vessel traffic within the Industrial Canal. Additional discussion of the Magnolia LNG security zone and the moving security zone typically established around LNG carriers transiting the Calcasieu River and Ship Channel is provided in RR 8.

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Magnolia has coordinated with the USCG Captain of the Port, Port Arthur and Marine Safety Unit (MSU) Lake Charles, Louisiana, to prepare and submit the required Follow-On to the preliminary WSA for the Project. The USCG participated in the port stakeholder waterway risk assessment workshop held July 8 to 10, 2013, as part of the Follow-On WSA process. Among other things, the USCG will evaluate the suitability of the proposed vessel route for the expected size and number of LNG carrier and LNG barge transits. Waterway safety and security considerations are included in the USCG's evaluation. The Follow-On WSA, dated November 25, 2013, was submitted to the USCG on December 6, 2013. This document is currently under review. Magnolia will continue to work with the USCG on issues related to the Follow-On WSA and related port safety and security matters.

1.1.7 LNG Truck Loading

The Project would include facilities that allow a portion of the LNG to be loaded onto trucks for road distribution to LNG refueling stations in Louisiana and surrounding states. The LNG truck-loading area would include the following main facilities:

- cryogenic pipework (loading and vapor return) from the LNG storage tank(s) to the LNG truck-loading area
- flexible cryogenic hoses (loading and vapor return) for filling
- control panel within a shelter
- a turning circle for LNG trucks

The capacity of the LNG trucks would be approximately 12,500 gallons (47 m³) with a loading flow rate of approximately 265 gallons per minute (60 m³/hr). The anticipated volume of LNG to be delivered by truck once the Project is fully operational is about 2,461 m³ per year (650,000 gallons per year). It is currently projected that, on average, one truck would be loaded per week at the proposed facility when operating at full capacity and more LNG fueling stations become operational in Louisiana and neighboring states. The U.S. Energy Information Administration's (EIA's) Alternative Fuel Data from 2011, the most recent EIA analysis data available on point, shows an approximate total of 3,436 LNG-fueled vehicles in the United States in 2011, a strong increase from the approximately 2,640 LNG-fueled vehicles reported for 2003. An estimated 881 of the total 2,640 LNG-fueled vehicles in 2003 were trucks. That number more than doubled to approximately 1,791 LNG-fueled trucks in 2011. (U.S. EIA 2013c)

The numbers of LNG-fueled trucks in the United States continue to increase. In fact, the Department of Energy's Office of Efficiency and Renewable Energy reports that through the efforts of its Clean Cities coalitions,⁴ approximately 3,400 LNG-fueled vehicles were on the

⁴ The Clean Cities program is a national network now comprised of nearly 100 Clean Cities coalitions focused on getting alternative and renewable fuels, idle-reduction measures, fuel economy improvements, and new transportation technologies into the market. The program was established in 1993 pursuant to the Energy Policy Act

roads in the United States in 2012 (U.S. Department of Energy 2014).⁵ In addition, industry analyst Zeus Intelligence⁶ reported earlier this year that of 5,994 LNG-fueled vehicles in the United States, there are 4,522 LNG-fueled trucks (Zeus Development Corporation 2014). This number is expected to continue to grow as companies with large-scale, long-haul trucking needs announce plans to make significant investments in LNG-fueled fleets. For example, international shipping company United Parcel Service (UPS), the largest shipment and logistics company in the world, recently announced that it will purchase 700 LNG tractors, used in tractor trailers, by the end of 2014 (UPS 2014).

Following the commissioning of the first two trains, Magnolia is initially projecting that their market share would allow for approximately 26 trucked cargos annually (12,500 gallons average per cargo) based on the existing LNG fueling stations currently in operation and projected to be constructed in Louisiana and Texas. As the market develops and more LNG refueling stations become operational, Magnolia will seek to add additional market share, doubling the trucked cargos annually from the Magnolia LNG facility.

A transportation study has been conducted and its findings will be coordinated with the Louisiana Department of Transportation and Development and local community representatives to determine the best route to be used for future LNG distribution by trucks to provide access to domestic markets via U.S. Interstate Highway 10. LNG truck routing from the Project site to the U.S. Interstate highway system is discussed in detail in RR 5, "Socioeconomics."

1.1.8 Flare Stacks

The purpose of the pressure relief and flare system is to safely and reliably protect the plant systems from overpressure during start-up, shutdown, plant upsets and emergency conditions. Upset events that require flaring or depressurizing are not planned, and the control system design is designed to prevent such events. Planned flaring is usually associated with system cool down and for planned maintenance shutdown scenarios.

Two separate flares would be provided: 1) cold flare to handle cold relief fluids, and 2) warm flare to handle wet/warm relief fluids. The flares would be adjacent to one another and therefore would share a common flare-stack structure that would be supported by a common guyed wire system. The stack supporting the two flares would be approximately 100 feet in height. During normal operation, no flaring would take place as boil-off gas (BOG) is recovered and utilized as fuel in the CHP plant's auxiliary boiler.

The cold flare would be connected to the vapor return line from ship-loading. This line would feed the LNG tank to maintain tank pressure during ship-loading. The flare would be ignited only when the over-pressure valve opens and when a flammable gas mixture is present at

of 1992 and is part of the U.S. Department of Energy's Vehicle Technologies Office. (National Renewable Energy Laboratory 2013)

⁵ These are self-reported numbers and the information does not distinguish between LNG long-haul trucks and other LNG-fueled vehicles.

⁶ On April 22, 2014, Zeus Intelligence was acquired by Hart Energy.

the flare tip. This is a safety overpressure system and is not designed for use during normal operations. The composition of the flared gas will be per the LNG specification (95.7 percent methane, 0.3 percent propane, 3 percent ethane, 1 percent nitrogen).

The warm flare would be connected to the liquefaction trains and would only flare during plant start-up or process upset conditions. The flared gas would be either the feed gas composition (95.7 percent methane, 0.3 percent propane, 3 percent ethane, 1 percent nitrogen) or LNG composition (similar to above) or MR composition (16 percent nitrogen, 33 percent methane, 39 percent ethane, 12 percent n-butane) or LP fuel gas composition (68 percent nitrogen, 32 percent methane).

1.1.9 Demineralized Water Treatment Plant

Demineralized water would be required for the steam plant and amine plant as makeup water. Groundwater would be used as feed water for the demineralized water treatment plant, along with condensed water produced by the gas turbine inlet air cooling system. Prior to condensing, this air would be finely filtered by the gas turbine inlet air filters. The volume and sources of required demineralized water required is covered in Section 1.1.10.2 and also in RR 2, “Water Use and Quality.” The water treatment system would be designed, supplied, installed, and monitored by a specialist from a water treatment company. The water treatment may include pre-filtering, reverse osmosis, electro-de-ionization, mixed resin bed, and chemical treatment prior to storage. Details about water treatment options would be determined during Front End Engineering Design (FEED).

Reject water from the demineralized water treatment plant would be drained to a holding basin and diluted with stormwater runoff prior to discharge to the Industrial Canal in accordance with LDEQ requirements.

1.1.10 Facility Drainage and Containment

Drainage, containment, and effluent treatment systems would be provided to ensure the proper disposal of effluents from process, service, and surface water streams, as well as domestic effluent from the LNG plant site, in accordance with LDEQ’s requirements.⁷ Magnolia has

⁷ The Louisiana Pollutant Discharge Elimination System (LPDES) is authorized under the USEPA’s delegated National Pollutant Discharge Elimination System (NPDES) program (which is authorized under the Clean Water Act) and promulgated through Louisiana Administrative Code (LAC) Title 33:XI.2503. A water quality certification is required for all projects that obtain a coastal use permit or a Section 404/10 permit.

The LPDES Permit Program is administered through LDEQ under LAC 33:IX.2511.B. For construction activities that disturb five acres of land or more, for applicable activities (clearing, grading, and excavation for construction activities) a Notice of Intent (Form NOI CSW-G) for LPDES Stormwater General Permit LAR100000 must be submitted to LDEQ detailing activities and discharges. The activities and discharges must be protective of T/E species, cultural resources, and total maximum daily load (TMDL) limits on receiving waterbodies, and the requirements of the Stormwater Pollution Prevention Plan (SWPPP) must be met. Coordination with LDWF and the Louisiana State Historic Preservation Officer (SHPO) will be required to discharge stormwater from the proposed Project site. This coordination is typically conducted in coordination with the Section 404/10 permit and the Water Quality Certification (WQC) required under Section 401 of the Clean Water Act.

prepared a draft site-specific operational stormwater pollution prevention plan (SWPPP; see Appendix 2.F in RR 2).

Importantly, no operational process waters would be discharged directly to surface waterbodies. All stormwater would be directed into holding basins for dilution and temperature adjustment to ambient before discharging back into the Industrial Canal.

The following drainage systems would be provided:

- Storm/rainwater runoff from open ground areas outside the plant perimeter road would flow either into the site's perimeter road ditches or with the natural ground contours directed off-site. High point grade lines would be established outside the plant perimeter road to direct the flows as described. Perimeter road ditches would be directed to the East or West holding basins, then overflow into the Industrial Canal. Runoff from rooftops of buildings and shelters would be directed primarily to the natural ground contour flows.
- Storm/rainwater runoff from open ground areas inside the plant perimeter road would flow into the site perimeter road ditches and be directed to the east or west holding basins, then overflow into the Industrial Canal.
- Storm/rainwater runoff in the open ground areas of the plant process area would be directed to the perimeter road ditches around each train. The storm/rainwater runoff would be channeled to the east holding basin, and then allowed to overflow into the Industrial Canal.
- Storm/rainwater collected in process areas requiring non-LNG spill containment would utilize curbing, closed drain systems, troughs and swales to direct the storm/rainwater to either an oily water interceptor or the LNG spill containment system, where it would be directed to the east holding basin, then overflow into the Industrial Canal.
- All LNG equipment and piping systems holding LNG in the process area would be provided with a spill containment system utilizing curbed areas, troughs, open drains, and an impoundment basin to hold LNG spills (refer to RR 11, "Reliability and Safety," for a detailed description and routing of the LNG spill containment system).
- Storm/rainwater runoff in the LNG Tank area would be channeled to the LNG spill impoundment basin where it would be pumped to the west holding basin, and then overflow into the Industrial Canal.

The operational LPDES permit requirements will be determined during FEED, but will likely involve a Notice of Intent under the LPDES Multi-Sector General Permit for stormwater discharges associated with industrial activity. An Operational SWPPP and Spill Plan will be developed dependent on FEED.

- Storm/rainwater for the off-site areas would have curbed areas as required per the equipment and as the system process dictates. These flows would be directed to either an oily water interceptor or an LNG spill containment system, where it would be directed to the east or west holding basin, and then overflow into the Industrial Canal.
- Portable air-driven pumps would be used to pump out the oily water separators to vacuum trucks for disposal off-site in accordance with LDEQ requirements.

1.1.11 Control, Administration, and Workshop Buildings

The following building facilities would be required for the Project:

- **Control Room:** The control room would be located above the administration level to provide a view of the facility. It would include an open area with control and monitoring stations suitable for two operators. Separate rooms would be provided for instrument and electrical equipment and an uninterruptible power supply (UPS)/battery.
- **Administration:** This building would include offices for the plant personnel, spare offices, meeting room, open office area for work stations, kitchen, and bathrooms.
- **Workshop:** The layout, space, and facilities required for the workshop would take into account the specific requirements of the plant equipment to be maintained.
- **Shelters/Houses:** Smaller shelters and buildings to house various equipment may be required as per the relevant standards and guidelines.

1.1.12 Power, Water, and Communications

1.1.12.1 Power Supply Requirements

The total power requirement for each LNG train is 72.5 megawatts (MW), of which 66 MW would be generated from the gas turbines (driving the MR compressors) and approximately 6.5 MW would be imported from the Entergy Gulf States Louisiana, LLC (Entergy) grid.

Within each LNG train, the 66 MW of power required to drive the two General Electric (GE) Nuovo Pignone model BCL805 single-stage centrifugal MR compressors for the separate MR circuits, are generated by two 33MW GE PGT25+G4 gas turbines.

A CHP plant would recover the waste heat from the above-mentioned gas turbines to produce HP steam. This steam would be utilized by steam turbines that would drive the ammonia refrigeration plant within each LNG train, therefore increasing performance of the liquefaction process.

Power from the local Entergy electrical grid would be required to run motors for LNG loading pumps and boil-off gas (BOG) compressors, amine pumps, air coolers, lighting, instrument air package, N₂ generation package, and other minor items. At full plant capacity of 8 mtpa, the Project is expected to import a base load of approximately 26 MW during normal operating hours (24/7). An additional requirement of 5 MW of power (totaling approximately 31 MW) is expected to be imported from the electrical grid when loading LNG carriers, which would take approximately 18 hours each.

When in service, the loading of the smaller LNG barges would require less power and less time (approximately three to four hours to load). The frequency of LNG loading would be on average, one to two LNG carriers per week and an additional one to two LNG barges per week when operating at full plant capacity. Moored LNG carriers and LNG barges and tugs are self-sufficient and supply their own utilities, including their own power supplies.

Entergy, the local power provider, has an existing 230-kilovolt (kV) high voltage (HV) transmission line approximately 1.3 miles to the east-northeast of the Project site, which would be accessed by the Project. Refer to Section 1.12 for additional information on non-jurisdictional facilities. An analysis of potential environmental impacts to expand the service to the Project is provided in the applicable RRs.

Back-up power would be available for the Project. A packaged diesel engine/generator combination, typically referred to as a “genset,” would be used. A genset back-up is a fully standalone power supply that includes a base, enclosure, sound attenuation, control systems, circuit breakers, jacket water heaters, cooling system, starting system, fuel supply day tank, and spill containment system. The genset’s function is to auto-start during a loss of power event to supply back-up power to the plant’s process and safety systems to allow for a safe and controlled shutdown of the facilities. During engineering, procurement, and construction (EPC) design, an emergency load list will be finalized to size the genset back-up power requirements.

1.1.12.2 Water Supply and Sewage Handling

Water Supply and Sewage Handling During Operations

The Project site has access to potable water from the Calcasieu Parish (Ward 3) District 12 Water Works located immediately adjacent to the southeast corner of the Project site. An existing 12-inch water pipeline runs along the entire length of the property just north of Henry Pugh Boulevard. It is expected that this existing 12-inch water pipeline would be sufficient for the Project’s operational potable water needs of approximately 2,000 gallons per day, on average. Discussions with the Calcasieu Parish Engineer, Terry Frelot, confirmed this proposed plan. It is anticipated that no upgrades or improvements would be required. The potable water from Calcasieu Parish District 12 Water Works, sourced from groundwater wells, would be used for plant personnel in buildings, safety showers, and eyewash stations.

Magnolia intends to construct and develop two on-site groundwater wells. During operation, groundwater from these wells would be used for process, service, and plant fire water systems (see RR 2, Section 2.2.4, “Water Use,” and Section 2.2.6, “Operation Impacts and

Mitigation). The depths of these wells would be between 500 and 700 feet. Although two wells are planned, only one well would be used for plant water requirements. The second well would be available for use only if the primary well is out of service during operations. For information regarding water wells present within 0.25 mile of the Project site, please refer to RR 2, Section 2.4.6, “Water Supply Wells.”

Each LNG train would produce condensed water during operations when the gas turbine inlet air is cooled by the air inlet chillers, and this would be used to feed the demineralized water treatment plant within each LNG train. It is estimated that 31,700 gallons per day (average) would be produced from the turbine inlet air coolers within each LNG train. In total, all four trains are expected to produce an average of 126,802 gallons per day of condensed water. The water produced from the turbine inlet air coolers would be reused as feed water for the demineralized water treatment plant (refer to Section 1.1.7). Groundwater would be used to supply the balance of water required to feed the demineralized water treatment plant. Current water balance projections for the operational phase of the Project are included in Table 1.1-1.

Table 1.1-1 Estimated Facility Water Requirements at Full Plant Operational Capacity

Water Demand Requirements	Min Total Water Demand	Norm Total Water Demand	Max Total Water Demand
	(gallons per day)		
Demineralized Water Treatment Plant	167,378	210,000	278,964
Service Water	0	90	127
Plant Personnel (General Ablutions, Emergency Showers and Washdown)	740	1,820	3,329
Total	168,118	211,910	282,420

Water Supply Source	Min Total Water Supply	Norm Total Water Supply	Max Total Water Supply
	(gallons per day)		
Proposed Groundwater Wells	167,378	130,090	152,289
Water Generated from the Gas Turbine Inlet Air Coolers	0	80,000	126,802
Calcasieu Parish District 12 Water Works	740	1,820	3,329
Total	168,118	211,910	282,420

The sewage system would be developed to handle all wastewater generated during operation of the planned facility. It is currently anticipated that Magnolia would install a self-contained, aboveground treatment plant and employ a third-party contractor to operate and maintain as an individual system, per title 51 of the Louisiana Public Health-Sanitary Code (http://www.doa.louisiana.gov/osr/lac/Part%20XIII_July2005.pdf).

Water Supply and Sewage Handling During Construction

Water needs for the Project at peak manpower are currently estimated to be about 6,000 gallons a day, with an average of 1,800 gallons per day. Construction wastewater would be collected from construction facilities into holding tanks. The contents of the holding tanks would be removed by licensed vendors via vacuum trucks for proper off-site disposal. The work force, in general, will be serviced by a certified portable toilet vendor with wastewater periodically removed via vacuum trucks for proper off-site disposal.

Dust control would be implemented during construction; however, it is anticipated that dust control would be minimal during the summer months as the site is relatively small and construction would correspond with the rainy season. A standard 2,000-gallon water truck would be used during construction for dust suppression. An estimated 60,000 gallons of water would be used for dust suppression during the first year of site preparation. After site preparation is completed, permanent access roads within the site would be sealed to protect the sub-base.

Magnolia would use an off-site concrete batch plant for all concrete pours required to build the proposed Magnolia LNG plant facility, for additional information please refer to Section 1.5.4.9, “Materials and Equipment Delivery and Off-site Concrete Batch Plant.”

1.1.12.3 Temporary Tie-In Connections for Power and Water Supply During Construction

Magnolia’s proposed construction utility tie-in connections include power and water supply. Power would be connected through an existing 34.5 kV power line that parallels the south side of Henry Pugh Boulevard as depicted on Figure 1.1-8. An overhead power line would be extended over Henry Pugh Boulevard from a pole on the south side of Henry Pugh Boulevard to a pole on the Magnolia site which would drop down to a switch at the base of the pole located within the site. From that location, the electrical contractor would make the proper connections and distributions in accordance with the construction specifications for the Project. Water tie-in connection during the construction phase would be supplied through a fire hydrant fed by the 12-inch water main that parallels Henry Pugh Boulevard on its north side. Figure 1.1-8 shows temporary tie-in connection points for power and water supply during construction.

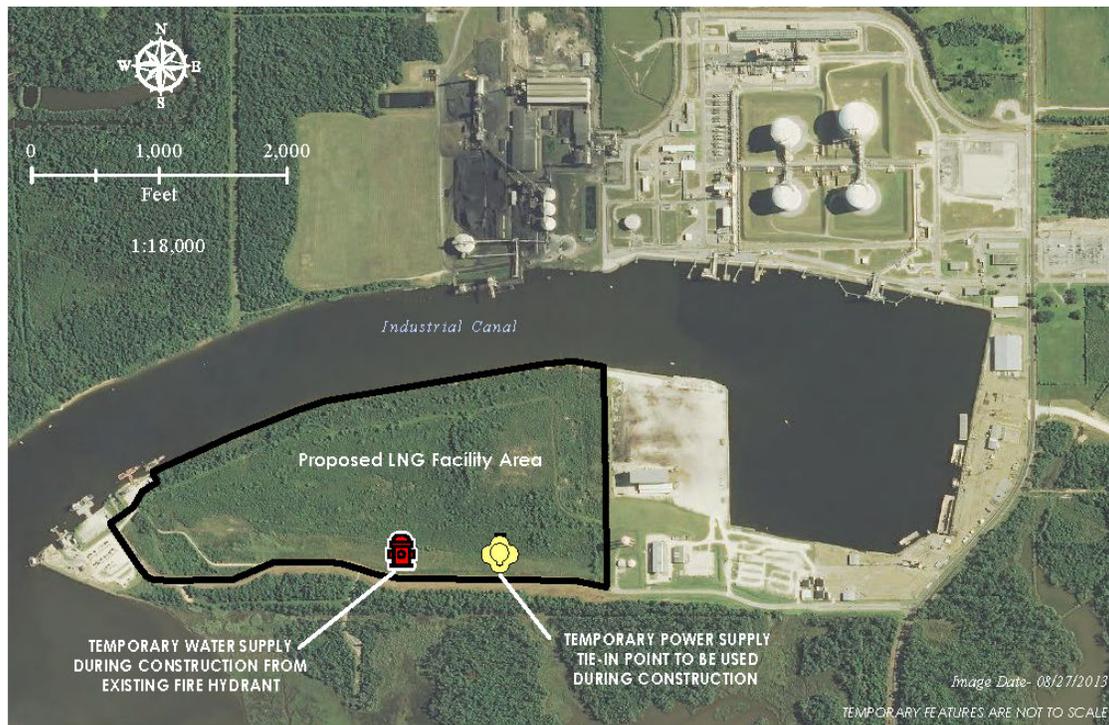


Figure 1.1-8 Temporary Tie-In Connection Points for Power and Water Supply During Construction

1.1.12.4 Communication

The telecommunication system for the Project would comprise the following:

- telephone exchange
- radio system
- computer network
- plant telecommunications network
- electronic mail system for communication
- closed-circuit television (CCTV) system

Communication with the following locations would be required:

- LNG carrier or LNG tug/barge
- local Programmable Logic Controller
- natural gas provider
- local power provider Entergy
- local emergency services
- company head office

The telecommunication systems shall comply with the governmental rules and regulations. Marine band very high frequency (VHF) radios would be provided for communication with the LNG vessels. Access to the control system would be provided to allow remote monitoring of the plant operation by approved parties.

1.2 PURPOSE AND NEED

The purpose of the Magnolia LNG Project is to construct a terminal to serve the domestic and export markets for LNG. The Project would:

- Provide an efficient and cost-effective outlet for the abundant new supplies of U.S. domestic natural gas available in the marketplace.
- Support export of LNG via large LNG carriers between 125,000 and 218,000 m³ capacity.
- Support domestic waterway transportation of LNG in barges of up to 15,000 m³ capacity for use as vessel fuel in shipping and the offshore oil and gas industry.
- Support domestic highway distribution of LNG in trucks of approximately 12,500 gallons (47 m³) capacity to serve the emerging business of providing LNG as fuel for long-haul trucking and other emerging domestic uses of LNG.

Related Project objectives include:

- Minimizing Project environmental impacts by selecting a site near the existing U.S. natural gas pipeline distribution network and minimizing the length of necessary natural gas supply pipeline interconnections.
- Minimizing Project environmental impacts by selecting a site located on an existing deep-draft channel suitable for use by LNG carriers and that minimizes the amount of dredging needed to develop the Project.
- Minimizing Project environmental impacts by selecting a site that can be developed with limited impacts to wetlands or other sensitive habitats.
- Minimizing Project environmental impacts by selecting an LNG liquefaction technology that maximizes thermal efficiency and reduces the amount of Project air emissions per unit of LNG produced by approximately 30%.

1.2.1 U.S. Natural Gas Supply

Magnolia anticipates that the sources of natural gas will include conventional and unconventional supplies from various producing regions, including recent shale gas discoveries in the Haynesville, Eagle Ford, Barnett, Floyd-Neal/Conasauga, and Marcellus shale plays. These shale plays represent a vast supply of natural gas, with a combined area of approximately

100,000 square miles and contain an estimated 553 trillion cubic feet (Tcf) of recoverable gas (U.S. EIA 2011). The size of traditional and emerging natural gas supply sources in proximity to the Magnolia LNG terminal would provide Magnolia's potential customers with diverse and reliable alternative gas supply options.

On August 1, 2013, the EIA released updated information on U.S. dry natural gas reserves showing that proved reserves as of December 31, 2011, reached 334.07 Tcf, while production increased to 23.56 Tcf (U.S. EIA 2013a). Most recently, the EIA estimated that proved U.S. natural gas reserves declined in 2012 due to low prices, but it anticipates the reserves for 2013 will be positively affected by the price recovery from 2012 to 2013 (U.S. EIA 2014). This updated information supports the conclusion that domestic natural gas supply as measured by proved natural gas reserves has been increasing and that a growing supply of natural gas is available under existing economic and operating conditions (U.S. Department of Energy 2013a). The Magnolia LNG Project seeks to use the increasing supply of U.S. natural gas to serve the U.S. domestic and export markets for LNG.

1.2.2 LNG as Vessel Fuel

LNG is increasingly being considered as a fuel for large and small marine vessels, both in the United States and around the world. The Project is being designed to meet that need. Several factors are motivating vessel owners and operators to consider using LNG as vessel fuel including reduced cost of fuel compared to diesel and the need to reduce air emissions to comply with international environmental requirements for ships. The marine industry has employed natural gas fuel in the LNG carrier fleet for many years; however few other large ships have been outfitted for natural gas due the historic lower cost of heavy fuel oil.

Annex VI of the International Maritime Organization (IMO) Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78), outlines international requirements for vessel air emissions and shipboard air pollution prevention measures. MARPOL 73/78 Annex VI entered into force for the United States on January 8, 2009. Starting on that date, U.S. ships operating anywhere and foreign-flag ships operating in U.S. waters must comply with the requirements set out in MARPOL Annex VI (USCG 2012a).

On March 26, 2010, IMO adopted amendments to MARPOL Annex VI, by resolution MEPC.190(60) to designate the new North American Emissions Control Area (ECA) and in July 2011 by resolution MEPC.202(62) to designate the U.S. Caribbean Sea ECA (USCG 2012a). The North American ECA entered into force on August 1, 2011, and took effect on August 1, 2012. The U.S. Caribbean Sea ECA entered into force on January 1, 2013, and took effect on January 1, 2014. The boundaries of the North American ECA are shown on Figure 1.2-1.

Ships subject to MARPOL Annex VI operating within the U.S. and Caribbean ECAs will be subject to stricter air emissions guidelines than those operating outside the ECAs, especially regarding the amount of sulfur allowable in the ship's fuel oil. Ship fuel sulfur levels within ECAs are significantly reduced in comparison to non-ECA areas. Current and future ship fuel sulfur requirements are shown in Table 1.2-1.



Source: U.S. Environmental Protection Agency 2010.

Figure 1.2-1 Map of the North American Emission Control Area (ECA)

Table 1.2-1 MARPOL Annex VI Fuel Sulfur Requirements

Fuel Sulfur Standard (max percent by Weight)			
Global Sulfur Cap		Emissions Control Area Sulfur Cap	
On and after Jan. 1, 2012	3.50%	On and after Aug 1, 2012	1.00%
On and after Jan. 1, 2020	0.50%	On and after Jan. 1, 2015	0.10%

Source USCG 2012a.

A recent report observed that low natural gas prices in the United States and LNG prices below the Brent crude oil price in Europe provide incentives to move to LNG-fueled vessels as a means of meeting the 0.1 percent sulfur limit that will become effective in 2015 (Adamchak and Adede 2013). LNG is a potential solution for meeting these ship fuel oil sulfur limits since it has virtually no sulfur content and its combustion produces low levels of nitrogen oxide (NO_x) compared to marine fuel oil and marine diesel oil. Not only is LNG cleaner-burning, but it may have economic advantages on a heating value basis when compared to global bunker fuel prices (Adamchak and Adede 2013).

The advantage of potentially lower fuel cost combined with reduced air emissions means that LNG is increasingly being considered as a potential marine fuel source in many areas. Currently, six LNG-fueled offshore supply vessels (OSVs) are under construction by Harvey Gulf Marine to serve the offshore oil and gas industry along the U.S. Gulf Coast (Tita 2013). In anticipation of new build and vessel conversions using LNG fuel systems, the USCG recently issued a policy letter providing interim guidelines for the design and approval of shipboard LNG fuel systems since current regulations do not fully address these requirements (USCG 2012b).

On November 7, 2013, the U.S. Maritime Administration announced a \$1.4 million grant to support the increased use of LNG as a marine transportation fuel, including \$900,000 to Horizon Lines, Inc. for conversion of a specific vessel, and \$500,000 to Det Norske Veritas for a study to analyze the issues and challenges associated with LNG bunkering, which is the process of supplying fuel for ships, and the landside infrastructure needed to store and distribute LNG (U.S. Department of Transportation, Maritime Administration 2013).

The Magnolia LNG Project would have the ability to load LNG barges that could further distribute the LNG to ship and OSV fueling facilities in the region. Ships and OSVs would not be directly fueled/bunkered at the Project site. LNG barges loaded at the Project site would make bulk deliveries to the ship fueling facilities and OSV shore bases in the region. Magnolia has not yet established contracts with shipping companies or OSV operators to supply LNG as vessel fuel. However, this is an emerging business area that will be stimulated by recent establishment of the North American ECA. Major deep-draft port facilities along the central Gulf Coast that could be supplied by the Magnolia LNG Project include:

- Port of Lake Charles, Louisiana
- Port of New Orleans; Louisiana
- Port of South Louisiana, Louisiana
- Port of Baton Rouge, Louisiana
- Port of Port Arthur, Texas
- Ports of Houston/Galveston, Texas

LNG barges would also be capable of delivering LNG to OSV shore bases along the central Gulf Coast including:

- Port Fourchon, Louisiana
- Port of Iberia, Louisiana

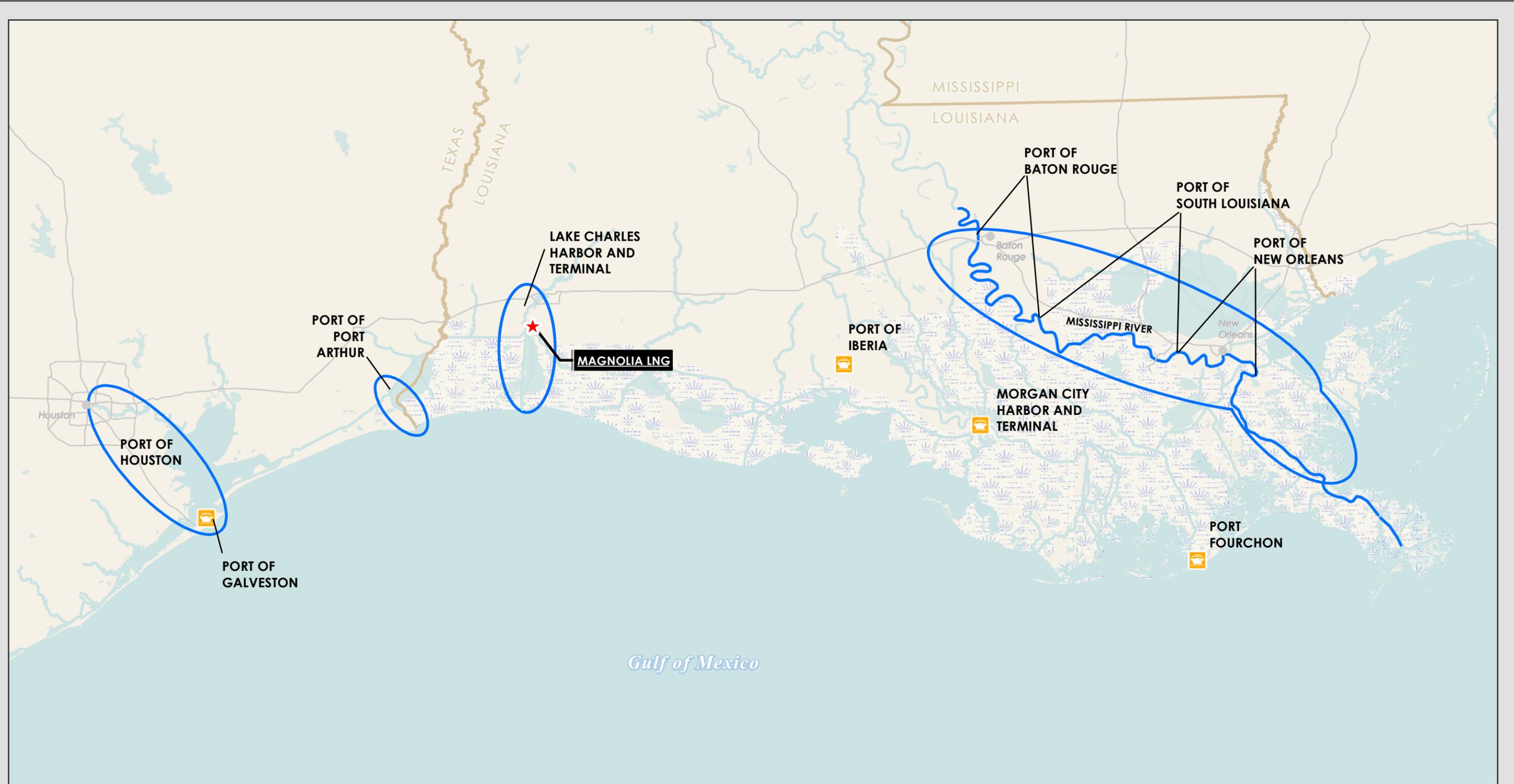
- Port of Morgan City, Louisiana
- Port of Galveston, Texas

Figure 1.2-2 shows the locations of deep-draft port areas and major OSV supply bases that could represent future delivery points for LNG produced by the Magnolia LNG Project. Since no contracts have been established between Magnolia and shipping companies to supply LNG as vessel fuel, it is not currently possible to describe actual shipping routes to be utilized or the frequency of deliveries. The USCG will be in charge of determining the suitability of waterways to support LNG vessel transportation and Magnolia will continue to engage the USCG to assess the safety and security of LNG vessel transportation as this market continues to develop. The USCG's full WSA process for LNG transportation is described in USCG Navigation and Vessel Inspection Circular No. 01-2011, "Guidance Related to Waterfront Liquefied Natural Gas (LNG) Facilities" (USCG 2011).

LNG would be transferred from the LNG barge to the port or OSV fueling facility in generally the same way that it is currently transferred between LNG ships and approved LNG waterfront facilities. All waterfront facilities that transfer LNG must be designed, constructed, and operated to comply with the USCG's LNG facility regulations in 33 CFR Part 127. These regulations include requirements to develop an LNG Operations Manual and an Emergency Manual. Each LNG transfer would require a preliminary transfer inspection (33 CFR 127.315), completion of a Declaration of Inspection (33 CFR 127.317) to ensure that all systems and procedures are satisfactory to start the transfer, and compliance with the LNG transfer regulations in 33 CFR 127.319. These same requirements will apply to the specialized barges transferring LNG to port facilities and OSV supply bases. Any transfer of LNG as a marine fuel between vessels is also required to meet the requirements of 33 CFR 155 and 33 CFR 156.

Magnolia is aware that the USCG is developing detailed policy guidance to clarify the applicability of existing regulations to the transfer of LNG for use as vessel fuel. USCG (CG-OES) Policy Letter No. 01-14, "Guidelines for Liquefied Natural Gas Fuel Transfer Operations and Training of Personnel on Vessels Using Natural Gas as Fuel" (USCG 2014a), as well as Policy Letter No. 02-14 "Guidance Related to Vessels and Waterfront Facilities Conducting Liquefied Natural Gas (LNG) Marine Fuel Transfer (Bunkering) Operations" (USCG 2014b), are currently in draft form and were recently circulated to the public and marine industry for comments. Magnolia filed comments with the USCG on these policy letters on March 6, 2014. Once finalized, these draft policy letters will provide additional guidance to vessel and waterfront facility owner/operators on the safety, security, and training requirements for vessels and facilities transferring LNG for use as vessel fuel. Magnolia will adhere to the applicable USCG regulations and the guidelines established by these two documents, as well as any other guidance that should be promulgated by the USCG prior to Magnolia LNG's commissioning date.

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**Figure Figure 1.2-2
Possible Ports to Receive
LNG from Magnolia LNG**
Magnolia LNG
Calcasieu Parish, Louisiana

Legend

- ★ Magnolia LNG Site
- 🚢 Major Offshore Support Port Area
- Deep Draft Port Area



0 10 20 Miles

1:1,700,000



Source- ESRI 2012, USACE 2006

Date: 3/28/2014

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1.2.3 LNG as Domestic Highway Fuel

Magnolia would have a truck loading facility to serve the regional needs for LNG highway fuel for long-haul trucks. It is also possible that the LNG trucks could supply local/regional marine fueling facilities as that marketplace emerges.

LNG highway transportation refueling stations generally receive their LNG supply from a liquefaction plant via LNG trucks specially designed to distribute cryogenic fuels. At the refueling site, LNG is offloaded into the facility's storage system. To support long-haul, heavy-duty trucks moving goods throughout the United States, LNG truck fueling stations along major interstate corridors are required. Numerous recent announcements by Clean Energy Fuels and Royal Dutch Shell have described plans for opening a series of LNG highway refueling stations (Environmental Leader 2012; FuelFix 2013). In 2012, Clean Energy Fuels met its goal of completing 70 LNG truck fueling stations (Environmental Leader 2012). The company, one of the largest providers of natural gas fuel for transportation in the United States, plans to build another 70 to 80 LNG fueling stations adjacent to long-haul trucking routes and around major warehouse distribution centers in 2013. Figure 1.2-3 shows the first phase of the Clean Energy Fuels LNG trucking corridor.

Operating LNG refueling stations in Louisiana and Texas are depicted on Figure 1.2-3 and include the following (U.S. Department of Energy 2013b):

- Interstate 49 in Freirson, Louisiana
- Interstate 10 in Baytown, Texas
- Highway 290/Interstate 610 intersection in Houston, Texas
- Richey Road and Interstate 45 intersection in Houston, Texas
- Bonnie View Road and Interstate 20 intersection in Dallas, Texas
- 4600 Irving Boulevard (Highway 386) in Dallas, Texas

Information on the weekly LNG long-haul truck visits to the LNG refueling stations closest to the Magnolia LNG terminal is not publicly available. Magnolia currently is exploring whether it may be able to purchase this information and will update FERC accordingly. Magnolia engaged in extensive research in an effort to obtain this information from a variety of sources, including the EIA, the USDOT's Federal Motor Carrier Safety Administration, the USDOT's Bureau of Transportation Statistics, the USDOT's Federal Highway Administration's Texas Division, the Texas Department of Transportation, the Texas Commission on Environmental Quality's Air Permits Division, the LDEQ's Air Permits Division, the Transportation Research Board, the Texas Railroad Commission, the Texas Department of Motor Vehicles, the Texas Department of Public Safety, a number of trade associations, the LNG refueling stations, and industry news and trade press.

1.2.4 Anticipated Growth of the LNG Trucking Industry

Regarding the anticipated growth of the LNG trucking industry, including LNG refueling trucks and LNG long-haul trucks, projections and market information demonstrate significant

anticipated growth over the next 5 to 10 years. The EIA stated in its Annual Energy Outlook (AEO) 2013 Reference Case, “fuel switching to natural gas in the form of compressed natural gas (CNG) and LNG already is projected to achieve significant penetration of natural gas as a fuel for heavy-duty trucks. In the Reference [C]ase, natural gas use in heavy-duty vehicles increases to 1 trillion cubic feet per year in 2040, displacing 0.5 million barrels per day of diesel use” (U.S. EIA 2013b). This growth will be driven by a number of factors, including the lower price of natural gas compared to diesel, as well as government-driven initiatives including emissions standards for heavy-duty trucks, anticipated fuel efficiency standards for heavy-duty trucks, and potential tax incentives.

1.2.4.1 Projections and Market Information

The number of LNG fueling stations, key to increasing the viability of LNG-fueled truck fleets, is projected to rise. In AEO2010, the EIA reported 38 then-existing LNG fueling stations in the United States (U.S. EIA 2013b). The Department of Energy’s Fueling Station Locator now lists 50 LNG refueling stations in the United States (U.S. Department of Energy 2013b). However, that number may under-report the number of stations. In a January 30, 2014, report, Zeus Intelligence states that there are 74 LNG fueling stations operating in the United States (Zeus Development Corporation 2014) and the number is expected to grow significantly over the next 5 to 10 years.

UPS (2014) has announced plans to open four new LNG refueling stations in 2014. Zeus Intelligence’s LNG Fuel Stations Database lists approximately 47 LNG fueling stations as “planned/under construction” (Zeus Development Corporation n.d.) and Clean Energy Fuels Corporation lists nearly 95 LNG fueling stations as “coming soon” (Clean Energy Fuels 2014). In addition, Shell and TravelCenters of America, LLC (TA) have announced an agreement to make a substantial investment in LNG fueling infrastructure with the goal of providing “the potential for the first-ever coast-to-coast LNG-fueled commercial transport network” (Shell 2013a). Their phased plan includes the construction of “at least two LNG fueling lanes and a storage facility at up to 100 existing TA and Petro Stopping Centers branded full service travel centers along the U.S. Interstate highway system” (Shell 2013a). Early last year, Shell also announced its final investment decision on two small-scale liquefaction units that it envisions “will form the basis of two new LNG transport corridors in the Great Lakes and Gulf Coast regions” to serve marine vessels and heavy-duty vehicles (Shell 2013b).

As the number of LNG fueling stations is expected to increase, so are the number of LNG-fueled trucks. In its AEO2014 Early Release, the EIA projects that in 2024, a total of 20,462 heavy-duty LNG-fueled trucks and an additional 16,527 medium-duty natural gas-fueled trucks will be in stock in the United States, the majority of which will be LNG-fueled (U.S. EIA 2013d). The EIA data show those numbers continuing to rise exponentially through 2040, when the heavy-duty LNG truck stock reaches 396,669 trucks and the medium-duty natural gas-fueled trucks reach 22,618 (U.S. EIA 2013d).

Announcements from major market participants also support the anticipated growth of LNG-fueled trucks in the United States. In addition to UPS’s announcement that it will purchase 700 LNG tractors, used in tractor trailers, by the end of 2014 (UPS 2014), Lowe’s last year

announced its goal to replace its entire diesel-powered dedicated fleet to natural gas trucks by the end of 2017 (Lowe's 2013). As part of a \$38.7 million initiative aimed at improving air quality and reducing greenhouse gases, commercial transportation and logistics provider Ryder System, Inc. (2014) has announced plans to deploy 202 heavy-duty, natural gas-powered trucks.

1.2.4.2 Lower Cost Fuel

As previously noted, one factor driving increased demand for heavy-duty LNG trucks is the low cost of LNG as compared to diesel in the United States. As the EIA notes in AEO2013, “[t]he fuel cost advantage is expected to be large enough in the view of a significant number of operators to offset the considerably higher acquisition costs of vehicles equipped to use [CNG and LNG]. . .” (U.S. EIA 2013b). Even with the number of natural gas vehicles worldwide forecasted to reach 1.9 million by 2022 (Navigant Consulting, Inc. 2014), the EIA’s AEO2014 Early Release projects that natural gas prices will remain low through 2040 relative to other global markets (U.S. EIA 2013b). The projected longevity of comparatively low natural gas prices supports continued growth in LNG-fueled trucks.

1.2.4.3 White House Initiatives

A number of initiatives from the White House could further fuel this projected development. Following President Barack Obama’s February 18, 2014, speech detailing a crucial piece of his Climate Action Plan (The White House 2014a), the President directed USEPA Administrator Gina McCarthy and Transportation Secretary Anthony Foxx to issue a Notice of Proposed Rulemaking on fuel efficiency and greenhouse gas emissions for heavy-duty trucks by March 2015, with final issuance a year later (The White House 2014b). At 20 to 30 percent lower average greenhouse gas emissions (Natural Gas Vehicles for America 2013), LNG-fueled vehicles are likely to be a significant element of the industry’s response to these new regulations.

The President also outlined a series of tax incentives for LNG-fueled vehicles and fueling stations as a supplemental element of his plan to reduce greenhouse gas emissions in heavy-duty trucks (Natural Gas Vehicles for America 2013). President Obama proposed that the federal government issue “new tax credits to companies that manufacture heavy-duty alternative-fuel vehicles and those that build fuel infrastructure so that trucks running on biodiesel or natural gas have more places to fill up” (The White House 2014a). The President’s Fiscal Year 2015 budget request also includes an investment of \$2 billion over the next decade from “Federal oil and gas development revenue, which would be placed in a new Energy Security Trust and help to provide a reliable stream of mandatory funding for research and development for alternative fuels such as domestically-produced natural gas” (The White House 2014c). These items, all part of the President’s Fiscal Year 2015 budget request, point to this Administration’s continued support of natural gas as a transportation fuel and support the likely continued growth in LNG-fueled trucks.

1.2.5 Environmental Objectives

The Project has a number of environmental objectives that were important in the site selection, pipeline strategy, and LNG liquefaction process selection. These objectives included:

- Selecting a site located near the existing U.S. natural gas pipeline distribution network and minimizing the length of necessary natural gas supply pipeline interconnections.
- Selecting a site located on an existing deep-draft channel suitable for use by LNG carriers and that minimizes the amount of dredging needed to develop the Project.
- Selecting a site that can be developed with limited impacts to wetlands or other sensitive habitats.
- Selecting an LNG liquefaction technology that maximizes thermal efficiency and reduces the amount of Project air emissions per unit of LNG produced.

The proposed Project has been designed to meet these Project objectives.

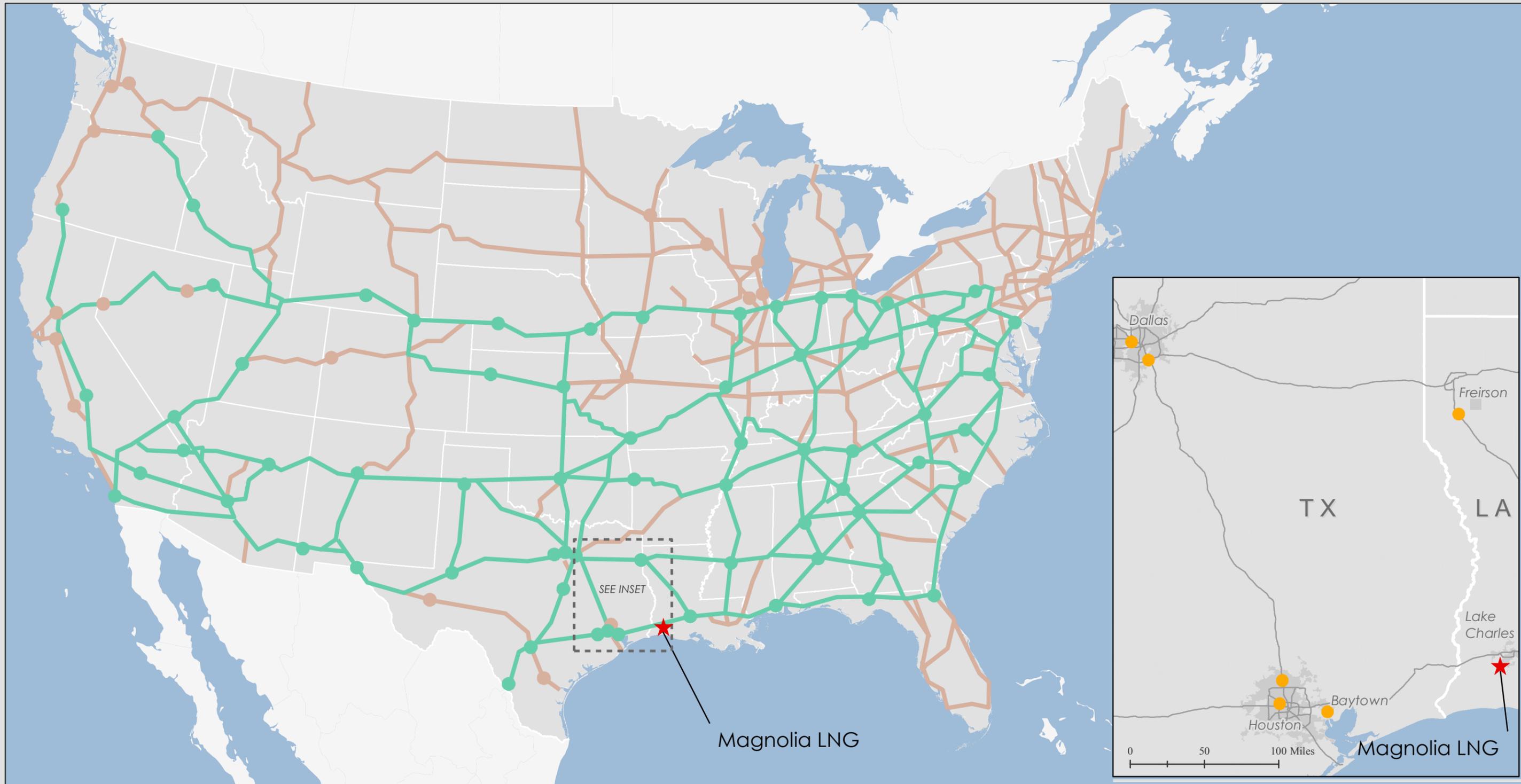


Figure 1.2-3
LNG Trucking Corridors Coast to Coast/LNG Truck Fueling Stations

Magnolia LNG
Calcasieu Parish, Louisiana

Legend

- 2012 Stations
- 2013 Stations
- Operational LNG Refueling Stations Closest to Magnolia Site (inset)
- 2012 Corridors
- 2013 Corridors
- Interstate Highway (inset)



0 100 200 Miles
1:15,600,000

Source- ESRI 2011, Clean Energy Fuels 2013, US DOE 2013
Date: 4/23/2014

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1.3 LAND REQUIREMENTS

The Project would require approximately 115 acres of land along the south shore of the Industrial Canal on Port of Lake Charles Tract 475. The Industrial Canal is located off the main Calcasieu River Ship Channel, as shown on Figure 1.1-3. Magnolia has executed an exclusive option agreement with the Port District that allows Magnolia the exclusive right to lease the site for an initial 30-year term, with four ten-year optional extensions.

Two 160,000 m³ LNG storage tanks would be constructed on the Project site. The LNG liquefaction modules and associated gas turbines and gas processing equipment would be constructed off-site in existing construction/fabrication yards located in southwest Louisiana or elsewhere depending on vendor selection. This would reduce the land requirements necessary for equipment storage or laydown areas on the Project site. The Magnolia team has completed site visits to several existing fabrication yards in the Gulf Coast region. Fabrication yards are large, open work areas that can accommodate a multitude of different fabrication requests. Upon award of a fabrication order, the fabrication company prepares its yard to meet the requirements and specifications of the fabrication order, which includes laying out a work plan to meet the requirements of the fabrication order. Due to the ongoing negotiations with the fabrication vendors, it is not prudent for Magnolia to name the intended fabrication yard owners and location until awarded.

Magnolia plans to use an existing construction yard owned by Dynamic Industries, Inc. (DII) and located immediately to the east of the Project site for marine deliveries⁸ (see Figure 1.3-1). The DII Lake Charles facility is located 12 miles south of the city of Lake Charles at the intersection of the Calcasieu Ship Channel and the Gulf Intracoastal Waterway. The facility is 22.4 miles north of the Gulf of Mexico. The DII facility performs structural steel fabrication and welding process piping fabrication assembly and hydrotesting, coating, electrical and instrumentation installation. There are two main fabrication shops on the DII site. The structural fabrication shop is 100 feet wide, 300 feet long, and 90 feet tall. The shop has three 20-ton overhead cranes with a maximum hook height of 75 feet. This shop is used for structural modular sections and is used to assemble large components indoors, which prevents weather delays on fast-track projects. The piping fabrication shop is 200 feet wide by 200 feet long. It contains two 20-ton overhead cranes with a maximum hook height of 22 feet. This fabrication shop is versatile and can be used either as a pipe fabrication shop or a secondary steel fabrication shop. An additional shop contains two separate warehouse areas and a mechanic shop. The warehouse is used to store weather-sensitive products.

The DII facility is capable of fabricating and shipping structures up to 12,000 tons. Structures can be loaded onto trucks and barges using cherry-pickers or crawling cranes. This facility has 1,100 feet of bulkhead and can accommodate a barge up to 175 feet wide, 400 feet long, and 25 feet in depth. For large structures that are loaded onto barges or ships, DII uses self-propelled modular transporters (SPMTs) to load the structures.

⁸ Discussions with Dynamic Industries Inc. (DII) on the use of facilities at their adjacent Lake Charles construction yard are ongoing. As such, the areas within the DII facility described for use in conjunction with the Magnolia LNG Project are preliminary and subject to change (see Appendix 1.D).

The LNG liquefaction process modules to be constructed off-site would be offloaded at the existing DII dock and transported across land via a heavy-haul road to the erection point at the Project site. Likewise, any other large equipment or material that requires delivery by vessel would use the existing DII dock. Barge unloading would be done in the location of the “crane pad” that is indicated within the area shown on Figure 1.3-1. No in-water activities are required as modules would be transferred from the barge and into final position using SPMTs. The SPMTs would wheel each process module sequentially into position and then lower each module onto piled supports. Smaller modules would be lifted using crane(s), as necessary. Equipment may, at times, be lifted over the water as the crane swings the load around. The relationship of the DII facility and dock to the Project site is shown on Figure 1.3-1. As a result, a construction and/or supply dock or berth would not be built specifically for the Project.

In addition, Magnolia plans to establish a contract agreement for the use of the DII facilities for temporary parking by construction workers (first two to three months after mobilization to the site to perform site preparation, clearing, and grubbing activities) and for an additional staging area during construction of the proposed facility. Additional construction activities would include a heavy-haul road between the Project site and the DII facility. The requirement for laydown areas during construction is included within the approximately 115-acre Project site; the existing DII facility would be used for staging purposes only.

Table 1.3-1 and Figure 1.3-2 identify the construction workspace areas and total acreage of land that would be affected on the Project site.

Table 1.3-1 Land Acreage Affected by Construction Workspace Areas on the Magnolia LNG Project Site

Facility Component	Area (acres)
Heavy-Haul Access Road	7.5
Heavy-Haul Road Laydown Area	1.6
Internal Roads	3.3
LNG Tank Laydown Area	19.0
Marine Laydown Area	2.3
Meter Station Laydown Area	1.3
Miscellaneous Laydown Area	17.5
Other Site Preparation and Grading	56.9
Construction Parking	3.2
Temporary Office Area	1.4
TOTAL	114.0

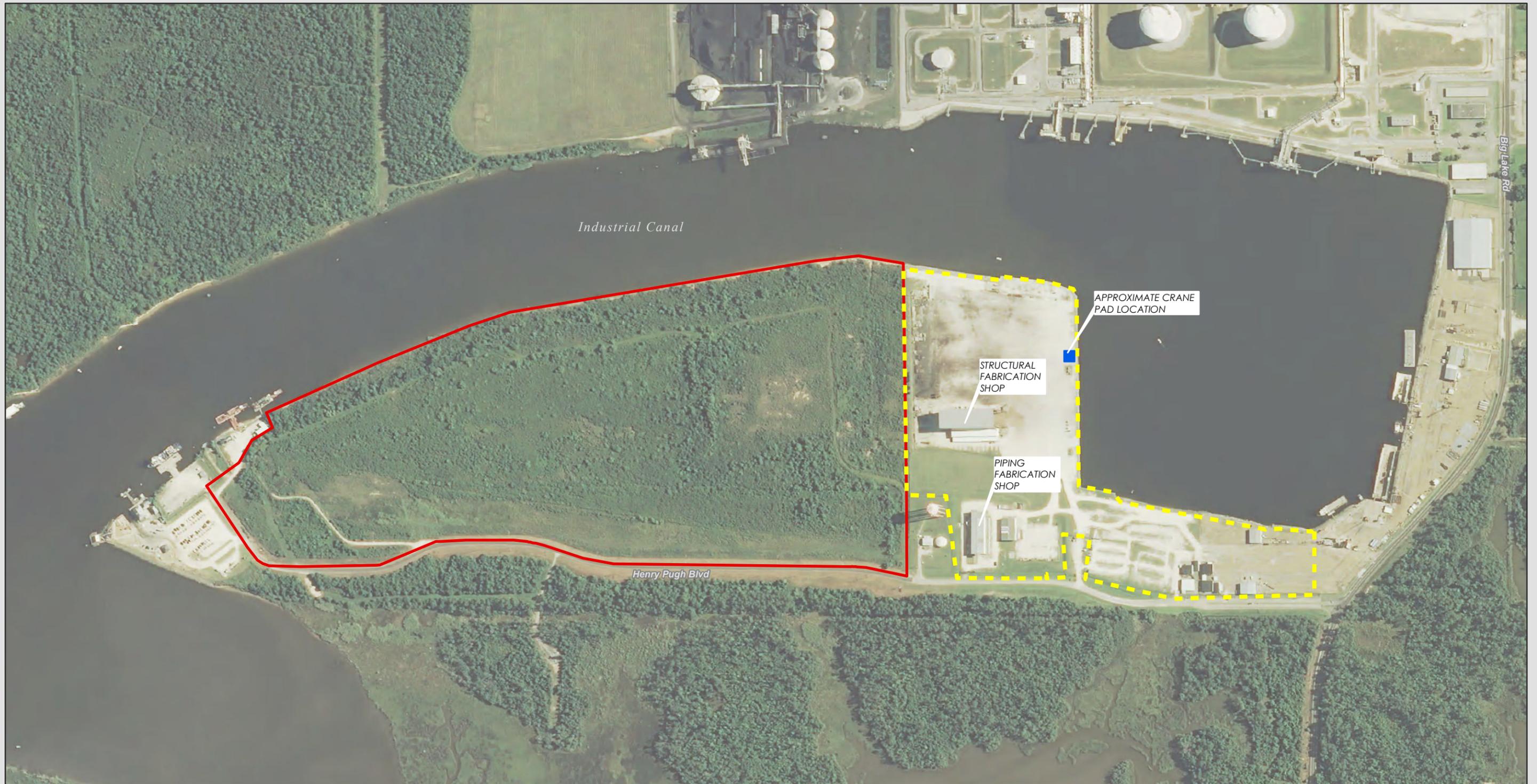


Figure 1.3-1
Magnolia LNG Project Site Boundary
Map in Relation to Existing Yard
Owned by Dynamic Industries, Inc

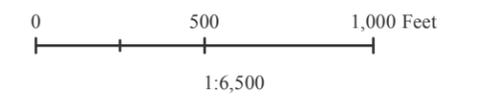
Magnolia LNG
Calcasieu Parish, Louisiana

Legend

-  Proposed LNG Facility Boundary  Dynamic Industries Facility  Approximate Crane Pad Location

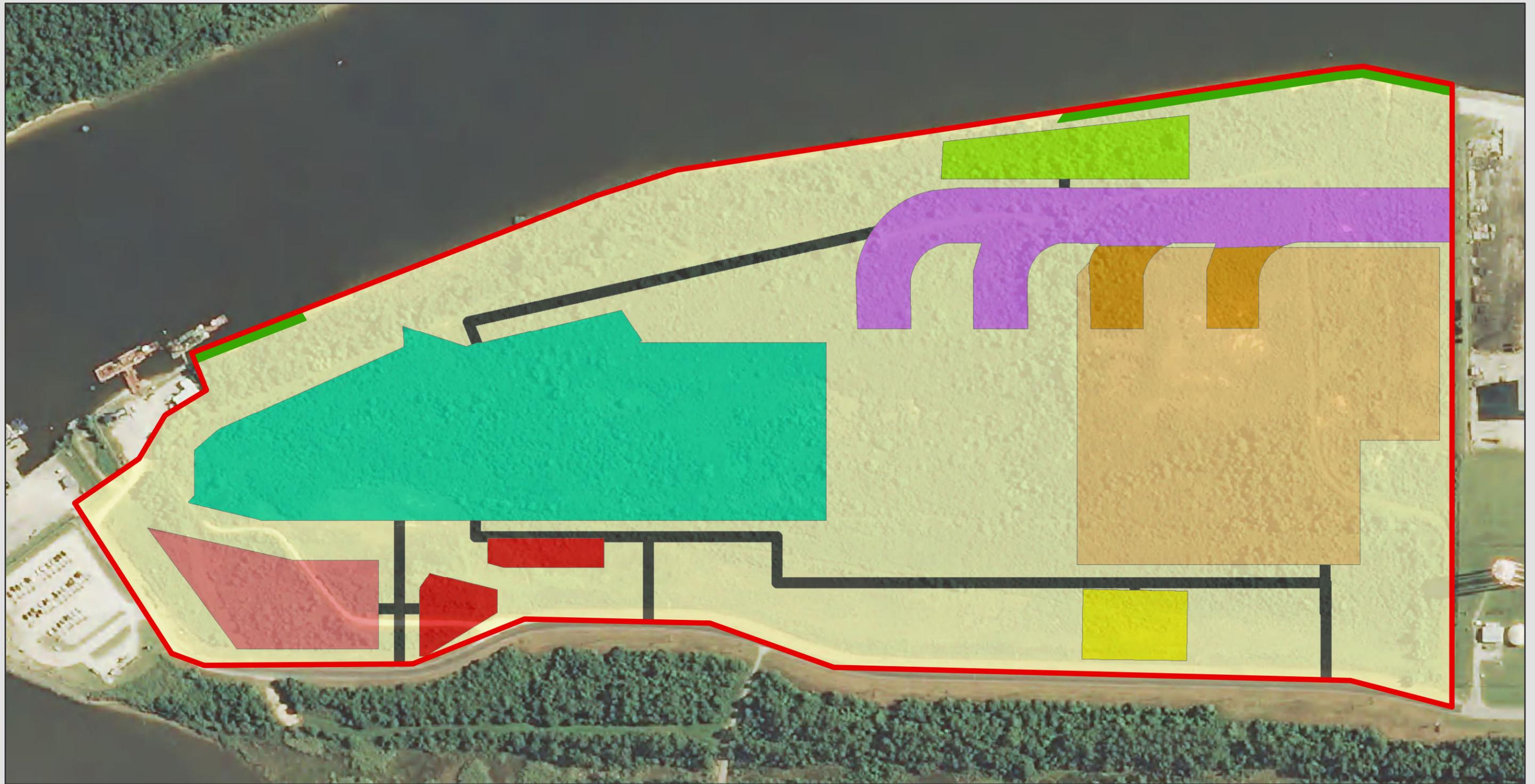


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LNG



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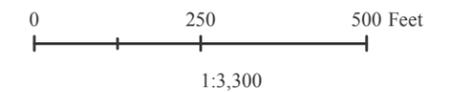


**Figure 1.3-2
Construction Laydown Areas on
the Magnolia LNG Project Site**

Magnolia LNG
Calcasieu Parish, Louisiana

Legend

- | | | |
|--------------------------------|------------------------------|------------------------------------|
| Proposed LNG Facility Boundary | Marine Laydown Area | Other Site Preparation and Grading |
| Heavy Haul Access Road | Meter Station Laydown Area | Construction Parking |
| Internal Roads | Miscellaneous Laydown Area | Temporary Office Area |
| LNG Tank Laydown Area | Heavy Haul Road Laydown Area | Undisturbed Area |



Source- ESRI 2011, NAIP 2013
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Table 1.3-2 and Figure 1.3-3 identify the temporary workspace areas and total acreage of land that would be affected at the DII construction yard. Magnolia would use existing local roadways to access the Project site during construction and operation. Currently, there are no existing roads on the Magnolia LNG plant site. Magnolia would construct a new heavy-haul road to transport the equipment from the existing DII construction yard and dock area to the Project site. Magnolia does not anticipate that any improvements to existing off-site roadways would be needed for construction and operation of the facility (refer to RR 8 “Land Use, Recreation and Aesthetics;” Section 8.2.1 “Land Use Requirements”).

Table 1.3-2 Land Acreage Affected by Construction Workspace Areas on Dynamic Industries, Inc. Yard Facilities^(a)

Facility Component	Area (acres)
Mobilization Parking Area	0.4
Temporary Module and Miscellaneous Materials Staging Area	4.8
TOTAL	5.2

Notes:

(a) Discussions with DII on the use of facilities at their adjacent Lake Charles construction yard are ongoing. As such, the areas within the DII facility described for use in conjunction with the Magnolia LNG Project are preliminary and subject to change.

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**Figure 1.3-3
Construction Areas
at the DII Construction Yard**

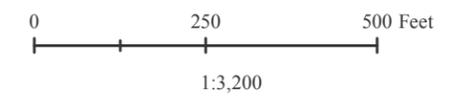
Magnolia LNG
Calcasieu Parish, Louisiana

Legend

-  Proposed LNG Facility Boundary
-  Dynamic Industries Facility
-  Mobilization Parking Area
-  Temporary Module and Miscellaneous Materials Staging Area



**MAGNOLIA
LNG**



Source- ESRI 2011, NAIP 2013
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Table 1.3-3 and Figure 1.3-4 identify the total acreage of land that would be affected by the operation of all Project components. Approximately 59 acres, or 54 percent of the site, would be impervious (i.e., pavement, buildings); 16 acres, or 14 percent, would be semi-pervious (i.e., compacted aggregate or packed soils); and the remaining 35 acres, or 32 percent, would consist of grassy surfaces, such as a upland meadow where vegetation is maintained in a graminaceous or weedy state due to mowing activities (if impacted by construction activities), or remaining existing habitat with no facility infrastructure or potential drainage from facility infrastructure.

Magnolia would use existing local roadways to access the Project site during operation. Currently, there are no existing roads on the Magnolia LNG plant site. Magnolia would construct internal roads and parking as shown on Figure 1.3-4. For dimensions of internal roads, please refer to Figure 1.3-4. Magnolia does not anticipate any improvements to existing off-site roadways that would be needed for construction and operation of the facility (refer to RR 8 “Land Use, Recreation and Aesthetics;” see Section 8.2.1 “Land Use Requirements”).

Table 1.3-3 Land Acreage Affected by Operation of the Project

Facility Component	Operational Area (acres)		
	Impervious Areas	Semi- pervious Areas	Pervious Areas
Control, Administration and Workshop Buildings	0.3		
Demineralized Water Treatment Plant	0.1		
Facility Drainage and Containment	1.2		
Flare Stack	0.4	0.7	
Gas Gate Station and Interconnect Pipeline	0.2	0.5	
LNG Storage	15.5		
LNG Trains	22.9		
LNG Truck Loading	0.2		
LNG Vessel Loading	2.4		5.7 ^(a)
Power, Water and Communications	0.7	0.8	
Security, Support and Standby Tug Berthing	0.1		
Internal Roads and Parking	9.3	1.3	
Other Site Preparation and Grading (Miscellaneous Disturbed Area)	5.7	13.0	33.0
Subtotals	59.0	16.3	38.7
	TOTAL	114 acres	

Note:

(a) Includes approximately 5 acres of open water.

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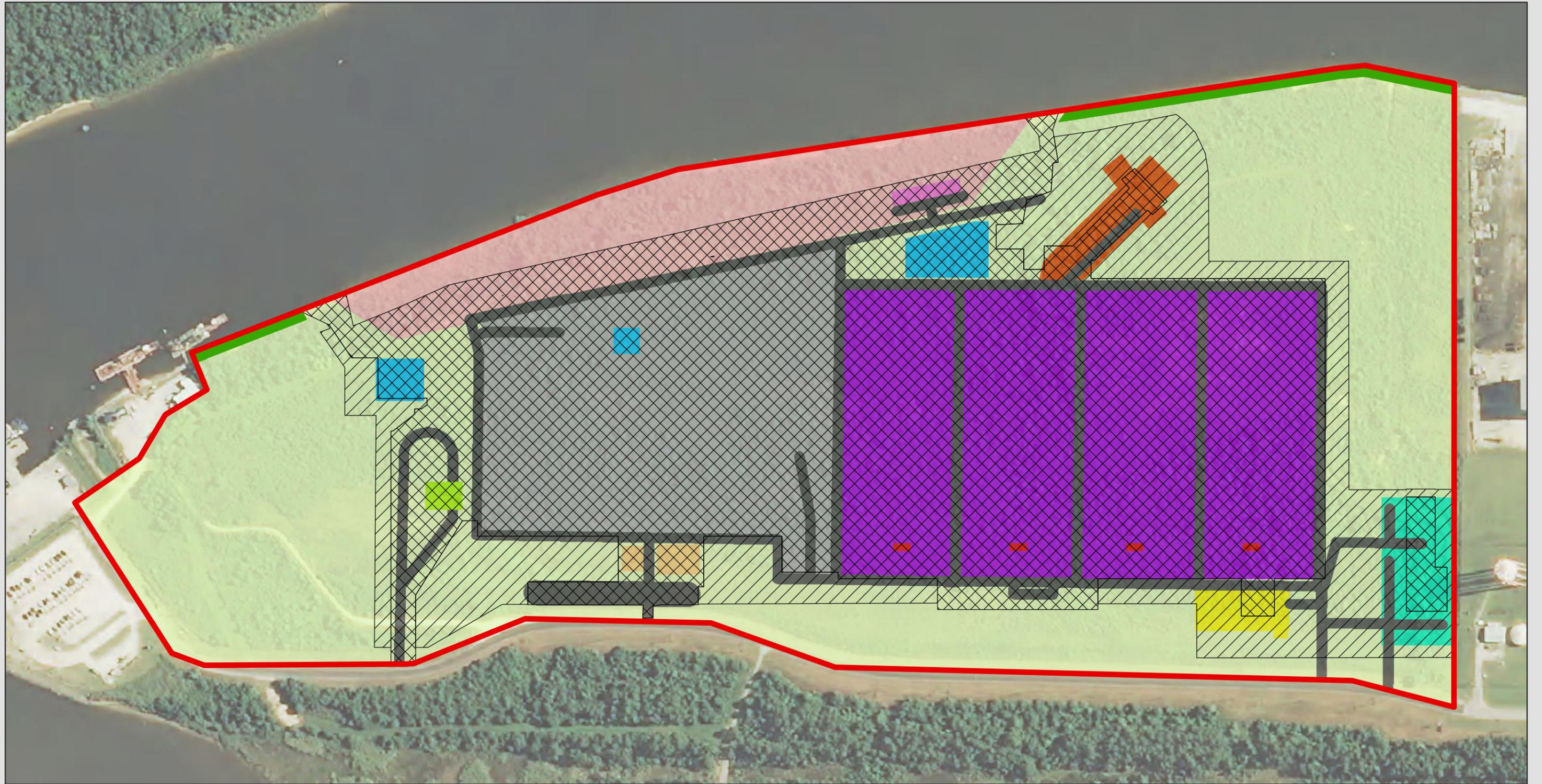
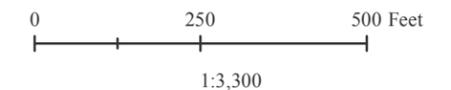


Figure 1.3-4
Land Requirements for Operation
of the Magnolia LNG Project

Magnolia LNG
 Calcasieu Parish, Louisiana

Legend

- | | | |
|--|--|--|
| Proposed LNG Facility Boundary | Gas Gate Station and Interconnect Pipeline | Miscellaneous Disturbed Area |
| Control, Administration and Workshop Buildings | LNG Storage Tank | Power, Water and Communications |
| Demineralized Water Treatment Plant | LNG Trains | Security, Support and Standby Tug Berthing |
| Facility Drainage and Containment | LNG Truck Loading | Internal Roads and Parking |
| Flare Stack | LNG Vessel Loading | Undisturbed Area |
| Impervious | Semi-pervious | |



Source- ESRI 2011, NAIP 2013
 Image Date- 08/27/2013
 Date: 4/23/2014

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1.4 PROCESS DESCRIPTION

For the process of liquefaction, Magnolia is proposing to use its highly efficient and patented OSMR[®] technology. The process is based on a simple single MR cycle, but the performance is significantly enhanced by the addition of conventional combined heat and power technology and conventional industrial ammonia refrigeration. These enhancements result in an efficiency improvement of at least 30 percent resulting in 30 percent less emissions.

As with all liquefaction technologies, the process of liquefaction involves removal of certain components, such as dust, acid gases, water, and heavy hydrocarbons, which could cause difficulty downstream at cryogenic temperatures. The natural gas is then condensed into a liquid at close to atmospheric pressure by cooling it to -260°F in a heat exchanger. Essentially, the liquefying of the treated feed gas is achieved by circulating a separate refrigeration circuit through the same heat exchanger. With the OSMR[®] liquefaction process, existing and proven technologies are used more innovatively to achieve better performance, and this section contains a more detailed description of the OSMR[®] LNG trains.

Magnolia proposes to use four OSMR[®] LNG trains each with a nominal capacity of 2.0 mtpa. Each LNG train would contain two independent parallel SMR circuits, each containing a 33-MW GE PGT25+G4 gas turbine driving a GE Nuovo Pignone model BCL805 single-stage centrifugal compressor.

Full and stable gas turbine power for these main refrigerant compressor drives would be achieved by using ammonia refrigeration to cool the inlet air into each turbine, thus increasing the output of the gas turbine. In addition to this, ammonia would be used to pre-cool the feed gas and the MR prior to entering the cold box. These features would combine to achieve an increase in plant capacity of 30 percent. This would enable the LP outlet MR stream from the cold box to return to the main compressor at a lower temperature, thereby significantly improving the compressor performance.

The effect of ammonia cooling on plant capacity and the fact that it would consume no additional fuel is substantial. Ammonia cooling would cause an increase in LNG plant capacity of around 30 percent without increasing the size of the major components of the liquefaction plant, namely the cold box, gas turbine, and MR compressor. These two simple enhancements of cooling gas turbine air and pre-cooling the MR would be major contributors towards the reduction in air emissions per unit of LNG produced. Minimizing air emissions was a key criterion in the design of the Project.

1.4.1 Gas Pre-Treatment Plant

The pre-treatment plant would comprise a gas sweetening plant and a dehydration plant which would remove components (principally CO₂, water, and any small amounts of BTEX) in the gas pipeline that would otherwise freeze solid or block the cold box exchangers at cryogenic temperatures.

Feed gas would enter at the Gas Gate Station at a controlled pressure and would pass via an inlet filter coalescer to separate any liquids prior to entering the Amine Unit. CO₂ in the gas would be removed using a proprietary amine solution in an absorber column. CO₂ would be removed to approximately 50 parts per million (ppm) in the contactor and the separated CO₂ would be vented to atmosphere. The water saturated gas then would be cooled to about 59°F (hydrate point is approximately 48°F) using the auxiliary refrigeration system and passed via a knock-out separator to remove bulk water from the gas and then routed through the molecular sieve bed dryers to remove most of the remaining water. Condensed water, along with trace amounts of amine, removed from the cooled gas stream would be recycled to the amine system as makeup water.

Gas with a water content of about 20 pounds per million standard cubic feet would enter the dehydration plant which would remove water down to less than 1 ppm. The dehydration plant would include three molecular sieve vessels. Two vessels would be in adsorption mode while the third vessel is being regenerated at full system pressure using a side stream of dry gas. Heating of regeneration gas would be provided by HP steam.

Wet regeneration gas exiting the dryer would be cooled to condense the water. The stream would be regulated to meet the required fuel gas pressure and the condensed water would be separated in a filter separator. This water would be returned to the amine sump as makeup water. The saturated gas stream would be heated to meet the required dew point before entering the gas turbines as HP fuel gas. No recycle compressor or fuel gas booster compressor would be required for regeneration gas since it would all be consumed as HP fuel gas. Any shortfall in fuel gas would be made up from the dry gas stream.

A mercury removal unit would be provided after the molecular sieve dust filters to ensure any mercury in the gas is removed prior to entering the liquefaction unit.

1.4.2 Liquefaction and Boil-Off Gas

The treated gas would be liquefied using an OSMR[®] plant comprised of a simple vapor compression cycle process. The MR would be comprised of nitrogen, methane, ethane, and n-butane.

Two separate independent parallel refrigeration circuits would be provided, each comprising a MR compressor, MR air cooler, CIK exchanger, and a main plate fin heat exchanger (cold box) and suction scrubber. The treated gas would split into two feed lines and enter each at a pressure of 100 pounds per square inch gauge (psig) at about -260 degrees Fahrenheit (°F) and would flow to the LNG storage tank. The refrigerant compressor would be driven by highly fuel-efficient low-emissions aero-derivative gas turbines. Fuel for the gas turbines would be provided by molecular sieve regeneration gas and by a small quantity of makeup feed gas. Prior to entering the cold box, the MR would be cooled in the CIK Exchanger using ammonia at a pressure of 44 psig and temperature of 30°F.

The MR for each cold box would be compressed to 600 psig by a single-stage centrifugal compressor directly driven by a gas turbine. The heat of compression would be removed by fin-

fan air coolers. The HP MR would then be partially condensed in the CIK using ammonia refrigerant. The HP MR would then be fully liquefied in the cold box and expanded (partially flashed), using Joule-Thomson effect, thus providing the refrigeration for the system. The LP MR would provide the refrigeration in the cold box and cool MR vapor would return to the compressor via the suction scrubber. The flashed vapor and BOG would be recovered from the LNG tank by two identical high-efficiency two-stage integrally geared BOG compressors. Only one compressor would operate during normal operation while the second unit would be started during LNG vessel loading. LNG would be sprayed into the vapor return line from the LNG vessel during loading to maintain constant vapor temperature entering the LNG storage tank and therefore constant suction (-238°F) and constant discharge (-76°F) temperature on the BOG compressors.

The BOG and flash vapor would be compressed to 100 pounds per square inch absolute (psia) and would return to the cold box where it would be substantially re-liquefied. The re-liquefied BOG would be separated and liquid methane would return to the LNG tank. A schematic of the OSMR[®] process is shown on Figure 1.4-1.

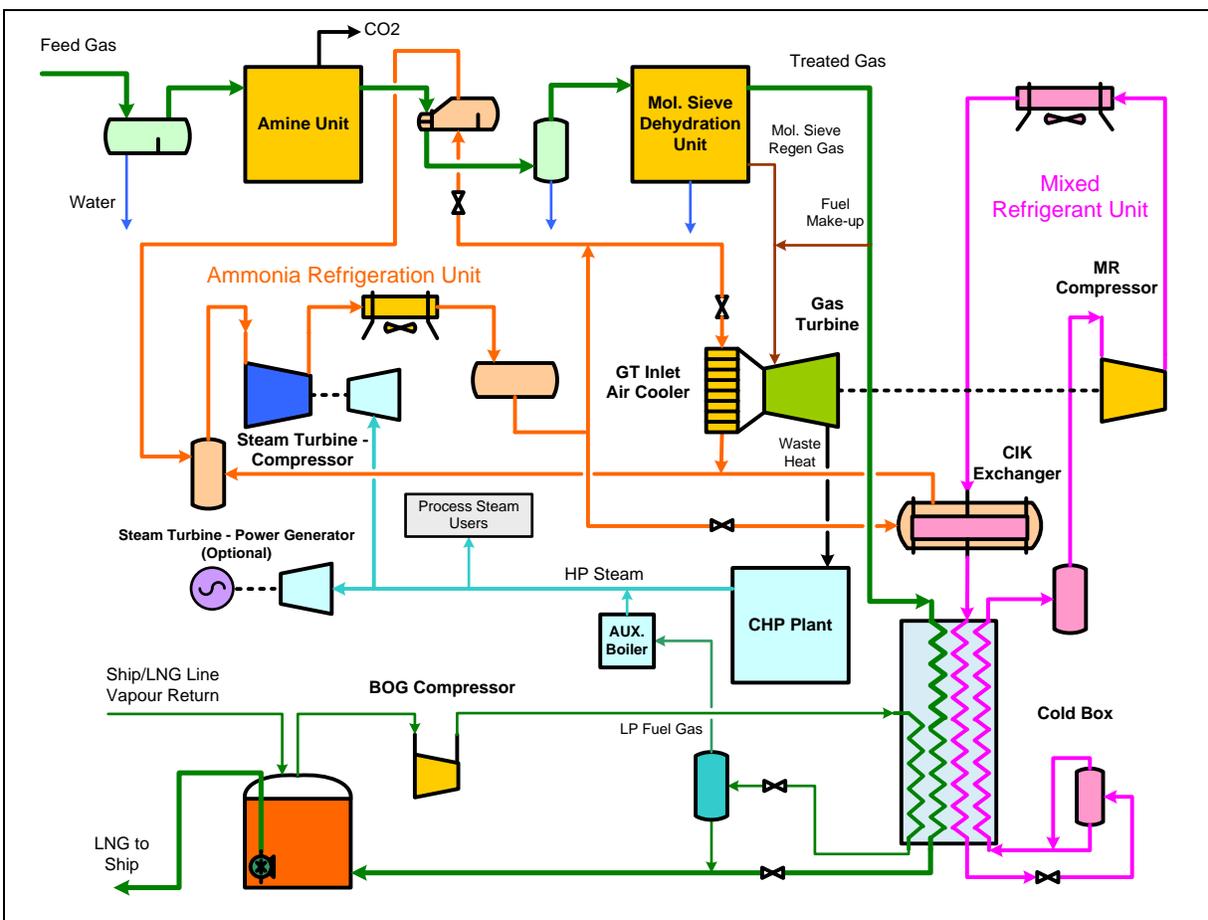


Figure 1.4-1 Process Schematic of OSMR[®] Process (1 MR Circuit Shown)

1.4.3 Refrigeration Circuits

Refrigeration to liquefy the feed gas would be provided principally by the SMR supplemented by ammonia refrigeration at the warm end of the cycle. The ammonia refrigeration plant would be powered by “free waste energy” generated by the CHP plant. The sizing of the ammonia refrigeration plant would be based on the spare power available from the CHP plant after all other heat users in the plant have been met. This ensures optimum use and balance of all available energy. The ammonia refrigerant would first be applied to cooling wet gas from the amine contactor then applied to cooling inlet air to the gas turbines to increase power, and the remainder would be used in pre-cooling the MR.

The ammonia refrigeration would use a conventional industrial refrigeration process comprised of steam turbine-driven centrifugal compressor, condensers, separator vessels, pumps, pipework, instrumentation, and control system (see RR 13, “Engineering and Design Material” for additional information).

1.4.4 Cold Box and Ammonia Pre-cooler

Each LNG train would comprise two parallel cold box/ammonia pre-cooler assemblies. Each assembly would comprise a conventional CIK exchanger mounted on a cold box, which encloses six parallel cores manifolded together with a common MR separator vessel. Only four streams are required within each cold box core so the configuration is very simple when compared to alternative LNG processes and typical ethylene processes. The differential temperatures between streams and resulting thermal stresses inside the cores would be within the limits required by the Aluminum Plate-Fin Heat Exchanger Manufacturers Association standards and would comply with the heat exchanger manufacturer’s requirements under all operating conditions. Start-up (including cool-down) and shutdown procedures and control systems would ensure that thermal stresses are kept within limits during steady-state and transient operating conditions including process upsets. The ammonia would cool the HP MR stream before it enters the cold box, thereby ensuring that low-temperature MR would return to the compressor suction, resulting in improved compressor performance.

1.4.5 Combined Heat and Power System

Proven CHP technology would be employed to recover the waste heat from the gas turbine so that all the process heat and steam power requirements for the plant are met, including all steam power for the ammonia refrigeration system. Steam would be generated via OTSGs which would generate HP steam to power a single pressure steam turbine generator, as well as supply the required quality of steam to various process heat users. OTSGs would be used to simplify the steam system design, again reducing the number of equipment items. No bypass stack or diverter damper would be required, so gas turbine(s) could continue to run and produce LNG even if the OTSG(s) were not operating.

Waste heat from the two gas turbines used in the MR refrigeration plants would be recovered to produce steam, which would be used in the CHP plant to provide plant heating and power. An auxiliary boiler fueled by lean flash gas produced from the BOG system also would

be used to supplement the steam production (refer to RR 13, “Engineering and Design Material” for complete details).

1.4.6 Reliability

Although the process would be highly integrated, which is necessary to achieve high efficiency, the overall plant availability would exceed 96 percent. This is mainly due to the fact that, if one gas turbine is down for maintenance, the plant would still run at half capacity. Also, if an ammonia compressor fails, the plant capacity would simply reduce slightly.

1.5 CONSTRUCTION SCHEDULE AND PROCEDURES

1.5.1 Schedule

Construction is projected to begin in mid-2015 (July 1, 2015) with proposed facilities placed into service by June 2018 as shown on the Project schedule in Appendix 1.D. If approved by the Commission, the construction timeline is expected to take approximately 36 months to the start-up of Train 1 of the proposed LNG facility (July 1, 2015 through June 30, 2018). It is estimated that there would be a three-month period between the commissioning of each successive train thereafter (June 1, 2018, through March 30, 2019). Thus, Train 4 would be commissioned nine months (March 30, 2019) following commissioning of Train 1. To summarize, the construction timeline is expected to take approximately 36 months to the start-up of Train 1 and an additional nine months for commissioning of the final trains.

1.5.2 Construction Laydown and Staging Areas

The requirement for laydown areas during construction is included within the approximately 115-acre Project site; the staging area within the DII facility would be located immediately to the east of the Project site. These areas are identified in Section 1.3, “Land Requirements.” Refer to Figures 1.3-1 through 1.3-3 for additional details.

1.5.3 Construction Employment

The construction of the Project would provide a stable source of income to the Louisiana and Gulf Coast communities. Louisiana in particular would benefit from the on-site construction, as the majority of the construction workforce would be sourced from the Project state. Furthermore, the state and local economies would benefit from the Project once the LNG facility is commissioned and fully operational. The expected operational life of the Project is 30 years minimum.

A summary of the on-site manpower projection during construction of the Project is presented below:

- **Direct Subcontractor Labor**
 - Peak Manpower = 443 Men @ peak months of Project
 - Average Manpower = 291 Men over lifespan of construction
 - Man hours = 1,546,100

- **Indirect Subcontractor Labor**
 - Peak = 68 Men @ peak months of Project
 - Average Manpower = 44 Men over lifespan of construction
 - Man hours = 309,220

- **Construction Management Labor**
 - Peak Manpower = 31 Men @ peak months of Project
 - Average Manpower = 20 Men over lifespan of construction
 - Man hours = 142,377

- **Total Project Labor**
 - Peak Manpower = 542 Men @ peak months of Project
 - Average Manpower = 355 Men over lifespan of construction
 - Man hours = 1,997,697

1.5.4 Construction Procedures

1.5.4.1 Site and Foundation Preparations

Onshore Site Preparation

Onshore Site preparation activities would include the following steps:

- Contractor would mobilize onto site from existing gravel road at the southwest corner of the property, from Henry Pugh Boulevard as shown on Figure 1.5-1.
- Contractor would conduct initial surveying of property lines, pipelines, and other property features, as deemed appropriate.
- Contractor would install appropriate erosion control measures along the property line and at existing primary property outfalls in accordance with site specifications for the Project.
- Starting from the southwestern property line (see area 1 on Figure 1.5-1), Contractor would begin site clearing in accordance with site specifications for the Project. The clearing stripping path is in the west-to-east direction in a north-south pattern as

shown by the arrows on Figure 1.5-1. Debris would be collected and disposed of off-site in compliance with local requirements.

- After the clearing operations, Contractor would begin stripping/grubbing of topsoil. Topsoil would be stockpiled on the west end of the property for reuse on-site, as needed. Grubbed material would be placed and disposed of with the clearing material.
- As the stripping/grubbing operations move in an easterly direction, survey crews would come in to set up the cut-and-fill grids on the property.
- Contractor would begin cut-and-fill operations after all stripping and survey work is complete.
- Contractor would begin cut, fill, and rough grading operations in the east-central (see area 2 on Figure 1.5-1) location of the property at the highest elevation, moving fill as directed by the cut-and-fill plan to lower areas, the most significant located in the northeast and southwest portions of the Project site, installing drainage swales, and establishing any additional erosion control measures that are deemed necessary, including their maintenance.
- In parallel with the cut-and-fill operations, Contractor would begin work on the property's westernmost road, truck-load out road, with the installation of the sub-base.
- In conjunction with the cut, fill, and site grading activities, Contractor would begin work on the heavy-haul road work.
- As cut, fill, and rough grading operations are complete, Contractor would continue with remaining plant roads, drainage system, parking lots, and temporary facilities planned.

Foundations Preparation

The tract of land where the Project is proposed to be located was previously used to deposit dredge material from excavation of the Industrial Canal and the turning basin.

A geotechnical investigation was undertaken and field work was completed during the month of September 2013 to determine the properties of the underlying soils at the proposed Project site (Fugro Consultants Inc. 2013). The outcome of this geotechnical investigation allowed evaluation of:

- suitable ground improvement techniques for the areas of the LNG storage tank and the LNG trains, if necessary;
- piling design options; and

- the best approach for excavating, dredging and constructing the LNG vessel loading facility.

The existing dredged spoil would ultimately need to be deposited off-site (refer to Section 1.5.4.2, “LNG Vessel Loading Facility Construction,” for additional information).

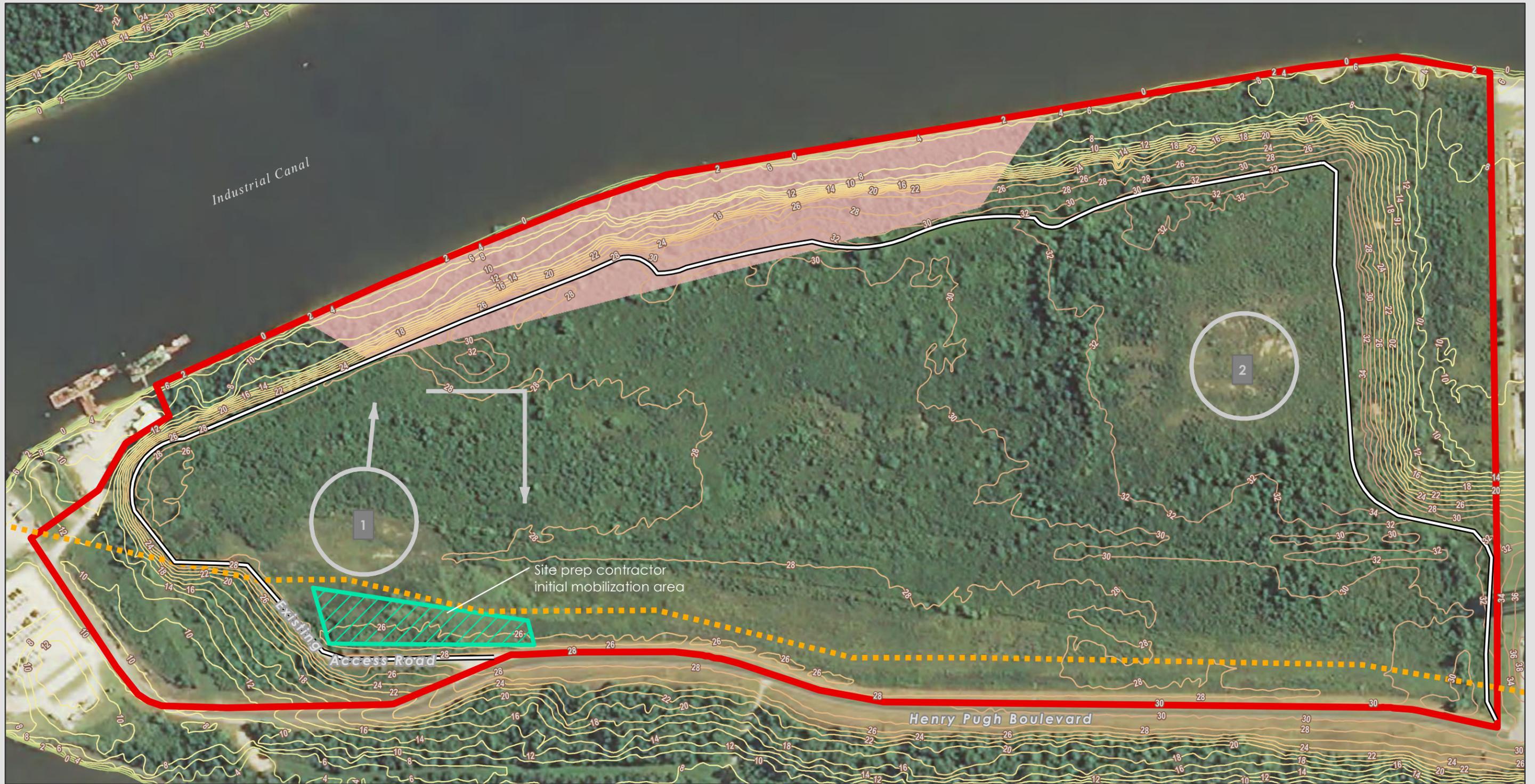


Figure 1.5-1
Site Preparation Mobilization and
Path of Construction Sequence

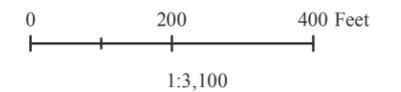
Magnolia LNG
 Calcasieu Parish, Louisiana

Legend

- Proposed LNG Facility Boundary
- 1 Site Clearing/Preparation in the Western Portion of Site
- 2 Site Clearing/Preparation in the East Central Portion of Site
- LNG Vessel Loading
- Existing Access Road
- Location "A"
- Path Direction
- Existing Kinder Morgan Louisiana Pipeline



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1.5.4.2 LNG Vessel Loading Facility Construction

The LNG vessel loading facility would be recessed into the northern boundary of the site as shown on Figure 1.1-6. To create the recessed berthing and waterway access area, a combination of onshore excavation and dredging would be required at the site. The Project site would be graded to a standard elevation of 28 feet above North American Vertical Datum of 1988 (NAVD 88). The LNG trains would have a base elevation of 24 feet. The LNG tanks would have a base elevation of 17 feet above NAVD 88, but would have a secondary containment wall with a standard top elevation of 30 feet above NAVD 88.

Based on a proposed final grade elevation for the facility of 28 feet above NAVD 88, the Project would require the dredging of approximately 862,550 cubic yards of sediment and soil from a 16.20-acre area required for the recessed ship berthing on the south shore of the Industrial Canal (approximately 9.80 acres are existing uplands and 6.40 acres are existing water bottoms or submerged). Approximately 131,200 cubic yards of soils would be excavated from upland areas and placed on-site. The final volume of these soils has not been determined as this is dependent on final facility earthworks design. Upland soils would be excavated and relocated on-site using backhoes, front-end loaders, bulldozers, and similar equipment. The dredging would be accomplished by using a hydraulic cutterhead dredge with a pipeline directing spoil material to approved upland contained disposal sites.

Magnolia's current plans include hydraulically dredging 862,550 cubic yards of material from the recessed ship berthing and transporting this material by pipeline to an upland reclaimed borrow pit located approximately 8,000 feet east of the Project site, just east of the CB&I (formerly Chicago Bridge & Iron Company) modular fabrication facility located on Big Lake Road. The reclaimed upland soil borrow pit is 1,000 feet by 2,000 feet with an approximate depth ranging between 12 and 15 feet. It encompasses 46 acres of a 160-acre parcel of undeveloped land that is zoned for heavy industrial use and is currently used by CB&I for staging and laydown as shown on Figure 1.5-2. The dredged material from the Project would be beneficially used to reclaim the borrow pit to its original upland condition. The proposed reclamation site is located outside of the Louisiana Coastal Zone (LCZ), 3,200 feet east of the Industrial Canal. Magnolia's dredge-and-fill permit application to the USACE will include details about the disposal of dredge spoil.

Dredging would be accomplished by use of a hydraulic cutterhead suction dredge with spoil material routed through a pipeline to the approved spoil disposal location. The dredge would swing back and forth to slowly cut away the nearshore sediments and shoreline to establish the specified dimensions and depths of the recessed berthing area.

Suction dredging reduces impacts to water quality as compared to some other dredging methods because the excavated material is suctioned into a pipeline minimizing the loss of material and resuspension of sediments into the water column. To further minimize dispersion or sedimentation of the water column, the following measures would be implemented when required:

- Reduction of cutterhead rotation speed to reduce potential for side casting sediment away from the suction entrance and re-suspending sediment (typically effective on relatively loose, fine-grain sediment).
- Reduction of swing speed to ensure that the dredge head does not move through the cut faster than it can hydraulically pump the sediment, thus reducing resuspended sediment.
- Eliminating bank undercutting by removing the sediment in maximum lifts equal to 80 percent or less of the cutterhead diameter.

The selected contractor also may be required to periodically monitor suspended sediment concentrations during excavation to ensure suspended sediment concentrations do not exceed threshold standards established by the regulatory agencies during project permitting. If turbidity levels exceed these thresholds, then mitigation measures may be applied, such as turbidity control structures (e.g., turbidity curtains around immediate dredging area) or a temporary shutdown of dredging activities. The protocol for water quality monitoring and implementation thresholds and authorizations for mitigation measures will be outlined in the Dredge Material Management Plan to be developed prior to commencement of dredging operations.

Since cutterhead dredging is generally not associated with significant turbidity issues at the dredging site, turbidity modeling prior to Project commencement is not anticipated to be required.

Dredging approval would be obtained from the USACE and material would be disposed of in accordance with the permit conditions and in conjunction with the Port of Lake Charles and the USACE. The exact size and location of the recessed area is shown on Figure 1.1-6.

The LNG carrier and barge loading facility would be constructed using a combination of 2,005 feet of steel sheet pile bulkhead combined with appropriate rock armoring at the sheet pile base and along the east and west ends of the mooring basin. There would be four primary breasting dolphins, plus one center protective breasting dolphin with a bumper panel only (refer to Figure S200 and S301 of Appendix K in CEII Volume, RR 13) constructed by installing 96-inch-diameter steel pilings in the water adjacent to the terminal jetty/pier to support the fendering system and equipment required to moor LNG carriers and LNG barges. More engineering would have to be performed before the installation depth of the steel piles for the breasting and mooring dolphin structures can be finalized. Based on preliminary information, the tip of these piles may be installed to approximately 110 feet below the bed of the Industrial Canal in order to develop the load-carrying capacity that is anticipated for these structures. Six mooring points would be constructed onshore landward of the steel sheet pile bulkhead to provide additional mooring leads for the design range of LNG carriers and LNG barges.

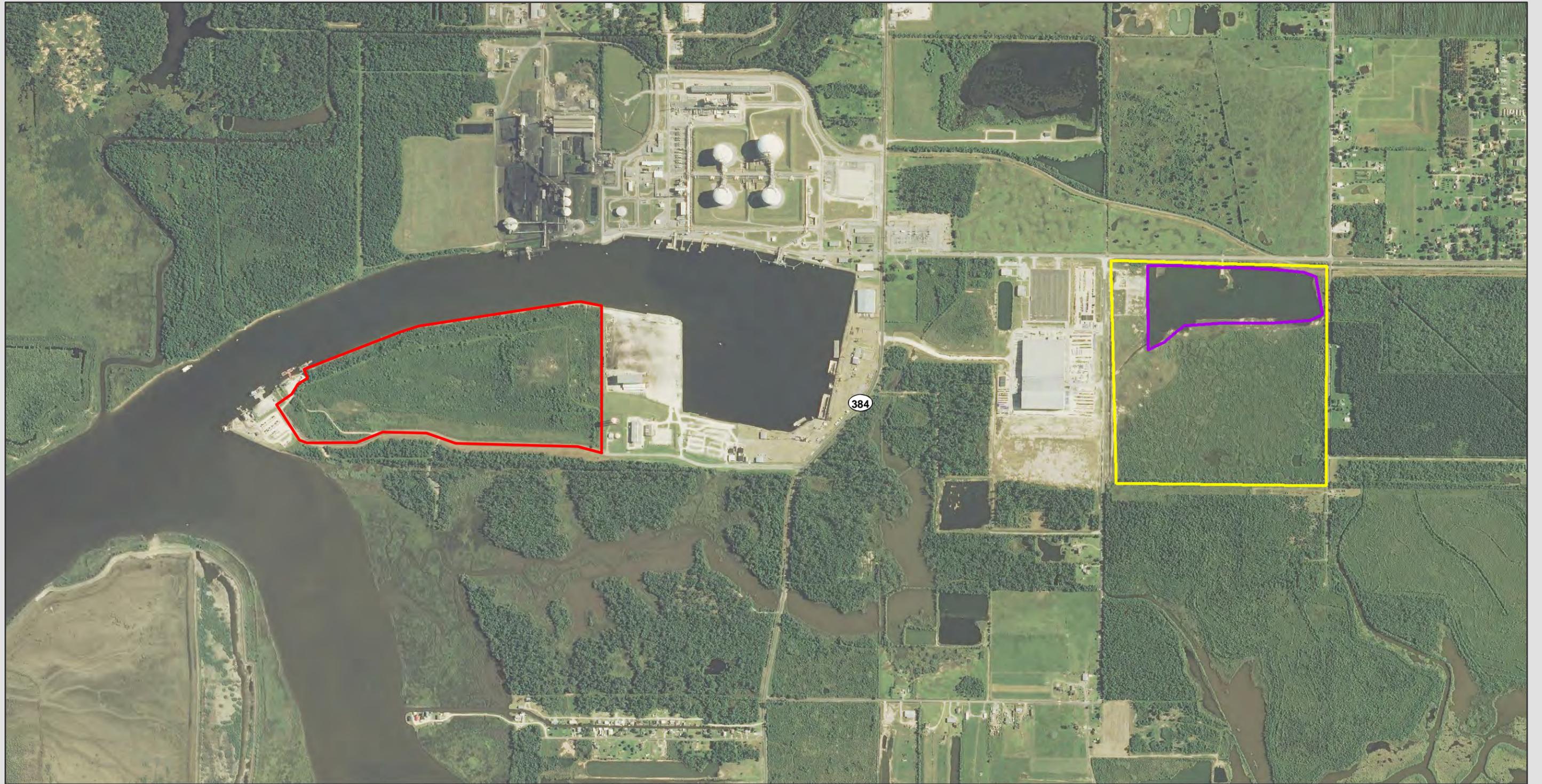
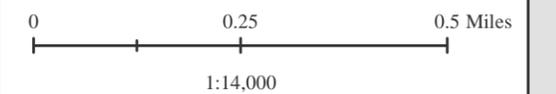


Figure 1.5-2
Chicago Bridge & Iron Company Pit
Site Boundary

Magnolia LNG
Calcasieu Parish, Louisiana

Legend

-  Proposed LNG Facility Boundary
-  Chicago Bridge & Iron Company Pit
-  Prairie Land Co Property



Source- ESRI 2011-2012, SONRIS 2014
Image Date- 08/27/2013
Date: 4/15/2014

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The LNG loading platform would be constructed of reinforced concrete with approximate overall dimensions of 128 feet long and 70 feet wide. A combination pipe and roadway trestle, approximately 26 feet wide and 128 feet long (located landward of the sheet pile bulkhead), would connect the LNG loading platform to the onshore liquefaction plant. The LNG loading platform would be supported by 24 concrete cylinder piles driven into the bed of the Industrial Canal and by the sheet pile bulkhead wall at the rear. The LNG loading platform would support three 16-inch LNG loading arms and one 16-inch vapor return arm for loading the LNG carriers, and one 8-inch LNG loading arm with a piggyback mounted 6-inch vapor return arm for loading LNG barges. More engineering would have to be performed before the installation depth of the concrete piles for the loading platform can be finalized. Based on preliminary information, the tip of these piles may be installed to approximately 110 feet below the bed of the Industrial Canal.

Additional equipment installed on the LNG loading platform would include three elevated firewater monitors towers, platform-level firewater monitors, a dry chemical system, a marine gangway, LNG process piping, and utilities. All marine structures would be connected by walkways extending east and west to the breasting dolphins. Figure 1.5-3 shows the steel sheet pile bulkhead, breasting dolphins, and the configuration of the Project's LNG loading platform.

The steel sheet bulkhead would be installed by use of vibratory hammer or a hydraulic pile driver. The five monopile steel breasting dolphin foundations also would be installed using a hydraulic pile driver. Likewise, the 24 cylindrical concrete pilings supporting the LNG loading platform would be installed using a hydraulic pile driver. The steel and concrete piling would be driven into the bed of the Industrial Canal to a depth to be confirmed by Project engineers. The rock armoring at the base of the steel sheet pile bulkhead, along the east and west ends of the marine basin and around the base of the LNG loading platform and breasting dolphin piles would be installed by crane or long-reach backhoe placement of the rocks into the water to provide protection to the bulkhead and shoreline from erosion caused by scour from the LNG carriers, or LNG barge tugs. The rock armoring would be delivered to the site by barge. Preliminarily, the anticipated shoreline protection at the base of the sheet pile wall around the basin would consist of an approximately 2-foot-thick $W_{50} = 30\#$ bedding stone layer with a 3-foot-thick armor stone that is $W_{50} = 600\#$. However, the exact details for shore-line protection including size, type, and quantity of rock armoring required will be developed during detailed engineering design and after the scour study has been completed.

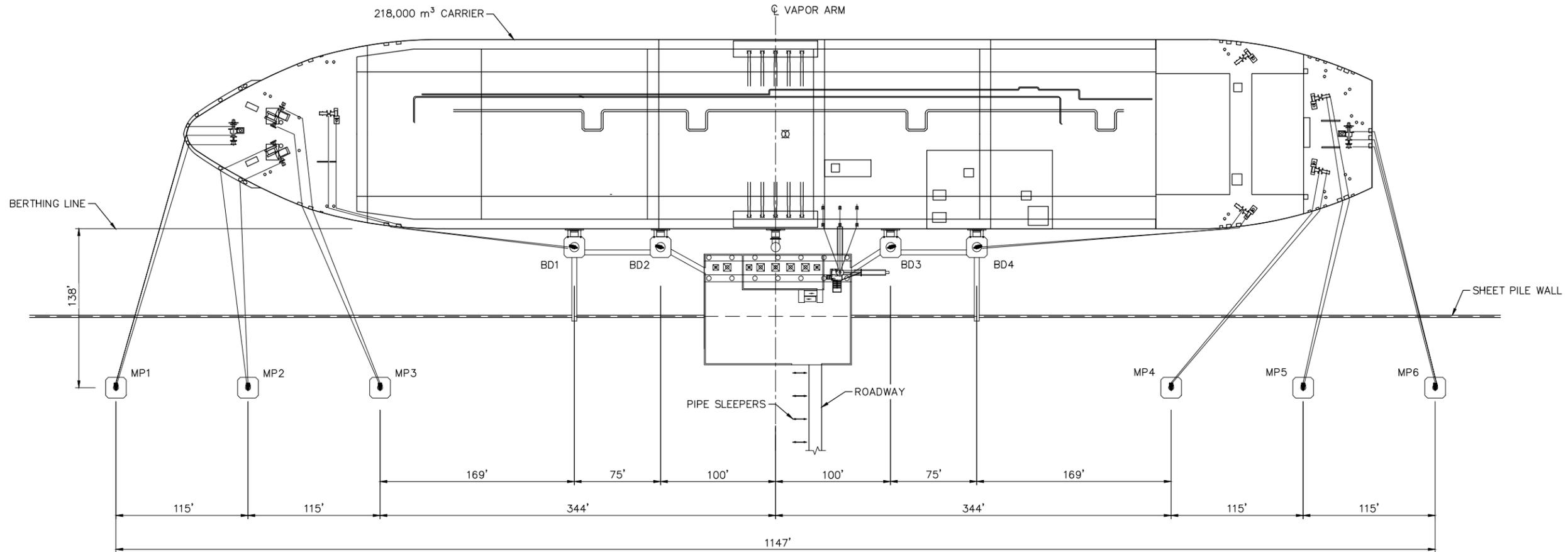
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TO CALCASIEU RIVER CHANNEL

INDUSTRIAL CANAL

TO TURNING BASIN



NOTES:

1. ALL DIMENSIONS SHOWN IN FEET.
2. BD# - BREASTING DOLPHIN
MP# - SHORE BASED MOORING POINT

B1 TYPICAL MOORING ARRANGEMENT FOR 218000m³ LNG CARRIER
S100 SCALE: 1"=50'



SCALE: 1"=50'
PRELIMINARY
NOT FOR CONSTRUCTION

Figure 1.5-3 Typical Mooring Arrangement for 218,000-Cubic-Meter LNG Carrier

MAGNOLIA LNG

Mark	Description	Date	Appr.
A	ISSUE FOR INFORMATION	8-26-13	XX

MAGNOLIA LNG
PRE-FEED MARINE FACILITIES
TYPICAL MOORING ARRANGEMENT
FOR 218,000m³ LNG CARRIER

Designed by:	Date:	Rev.
Dwn by:	8-26-13	8-26-13
Reviewed by:	M&N Project No.:	
Submitted by:	8166	
	Drawing code:	
	S100	
	Drawing Scale:	SHOW
	Plot scale:	1:1 (D SHEET)

11011 RICHMOND AVENUE
HOUSTON, TX 77042
713-977-7372

moftatt & nichol

CH-IV International

SEAL

Sheet Reference No.
S100

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1.5.4.3 LNG Trains

The LNG trains would be designed, constructed, operated, and maintained in accordance with USDOT Federal Safety Standards for Liquefied Natural Gas Facilities, 49 CFR Part 193. The LNG trains would also meet the NFPA 59A LNG Standards. RR 11 includes information about reliability and safety of the Project.

After site preparation and prior to commencing construction of the Project, it would be necessary to construct access roads to the process areas (see Section 1.5.4.1, “Site and Foundations Preparations” for additional details).

As part of the evaluation process, two different methodologies were considered for the construction of the LNG trains: modular construction and stick-build construction. These two methodologies are described in more detail in the alternative analysis (RR 10). Based on the engineering analysis performed, modular construction would be used for the assembly of the LNG trains. For information regarding the shipment of equipment and materials to the Project site, refer to Section 1.5.4.9, “Materials and Equipment Delivery and Off-site Concrete Batch Plant.”

Each LNG train would be broken down into five main process modules. These modules would be fabricated off-site in a regional construction yard and then transported to the site via barge. The barges would deliver the LNG process modules and other equipment to the existing dock at the DII facility located immediately east of the Project site. Water access to the site would be via the Gulf Intracoastal Waterway, the Calcasieu River and the Industrial Canal. The barges would need to arrive in a certain sequence to allow efficient assembly of the LNG trains. Each LNG train would require a total of three barges to deliver the modules to the site as shown in Table 1.5-1.

Table 1.5-1 Barge Arrival Sequence per Train

Barge Arrival Sequence	Modules/Components on Barge
First Arrival	<ul style="list-style-type: none"> ▪ Module 5 ▪ Module 4
Second Arrival	<ul style="list-style-type: none"> ▪ Module 3 ▪ Module 2 ▪ LNG Tank Platform A ^(a)
Third Arrival	<ul style="list-style-type: none"> ▪ Module 1 ▪ LNG Tank Platform B ^(a) ▪ Fire System Skid ▪ BOG Compressor Skid ▪ Other skids

Note: (a) First train only.

The four LNG trains are expected to require 12 barge deliveries in all. It is possible that one or more LNG train modules could be constructed at the adjacent DII facility which could reduce the number of barge deliveries required to construct the LNG trains. The modules then

would be transferred from the barge and into final position using SPMTs. The SPMTs would wheel each process module sequentially into position and then lower each module onto piled supports. Smaller modules would be lifted into position by crane(s), as necessary.

1.5.4.4 LNG Storage

The LNG storage tanks would be site-erected using conventional full-containment construction techniques. A high-level summary of the construction activities is as follows:

- Preparation of site and installation of foundations. The proposed foundation arrangement for each LNG storage tank would include the use of 1,508 pre-stressed concrete piles of 2 feet by 2 feet in cross-section by 70 feet in length. The two LNG storage tanks would have a combined total of 3,016 piles. The piles would be driven by hydraulic hammer as is typical of these installations. The installation would occur over a multiple-month period (see schedule at Appendix 1.D) due to the number of pilings required (refer to RR 13, “Engineering and Design Material”) for the proposed arrangement and piling specifications and numbers.
- Construction of the tank base and post-tensioning of the outer concrete container wall.
- In parallel to the outer concrete container wall construction above, the steel dome roof and suspended deck would be constructed on temporary supports inside the outer container, to be later air-raised into position.
- Bottom carbon steel vapor liner to be installed.
- On top of the outer concrete container wall, the steel dome roof compression ring would be cast into the concrete then the steel dome roof would be air raised into position and secured to the compression ring.
- Installation of roof nozzles, penetrations, and studs plus steel reinforcement and concrete covering of the steel dome roof would be undertaken.
- Concurrent with the roof nozzles and penetrations, work would commence on the inner 9 percent Ni steel container, including the secondary bottom, bottom corner protection, inner container annular and bottom plates.
- Commence erection of the inner tank 9 percent Ni steel shell.
- Install internal accessories such as pump columns, bottom and top fill, instrument wells, and purge and cool-down piping.
- Install roof platforms, walkways, pipework and pipe supports.
- Hydrostatic test on the inner tank.

- Pneumatic test on the outer tank as per American Petroleum Institute (API) 620 procedures.
- Install process piping from tank top down to grade.
- After the hydrostatic test, the tank would be washed down and cleaned.
- Install resilient blanket on the outside of the inner tank shell.
- Install the required instrumentation inside the tank and annular space.
- Expand perlite insulation into the tank annular space using vibration methods.
- Install suspended deck blanket insulation.
- Install external piping insulation.
- Visual inspection.
- LNG pumps would then be installed; tanks would be purged with nitrogen to a positive gauge pressure.
- Purge and cool-down.

1.5.4.5 Pressure Testing of Pipe Sections and LNG Storage Tanks

Pipe sections would be either hydrostatically or pneumatically tested depending on the type and intended function of the pipe. Prior to being placed into service, the LNG piping would be tested to ensure structural integrity. The cryogenic piping would be pneumatically tested and the non-cryogenic piping would be hydrostatically tested. In general, cryogenic piping would be pneumatically tested with dry air or nitrogen at 1.1 times the design pressure, while non-cryogenic piping would be hydrostatically tested using water from the Calcasieu Parish District 12 Water Works at 1.5 times the design pressure. Testing would be in accordance with American Society of Mechanical Engineers (ASME) standards.

The inner 9 percent Ni stainless-steel container of the LNG storage tank would be hydrostatically tested using water from the nearby Calcasieu River Industrial Canal. It is anticipated that the hydrostatic test level of each tank would be conducted by filling each of the tanks to a height of 73.5 feet, thus requiring a volume of 3.49 million cubic feet (26.2 million gallons) of water for the testing of each LNG storage tank, each with an inside diameter of 246 feet. It is anticipated that hydrostatic testing of LNG storage tanks would be conducted one at a time, allowing the water from the first hydrostatic test to be reused for testing the second LNG storage tank (refer to RR 2, “Water Use and Quality,” for additional information).

After the hydrostatic test is completed for the last LNG storage tank, the water would be tested, treated (as necessary), pumped out of the tank, and discharged into Calcasieu River Industrial Canal in a location and manner to be determined and in accordance with applicable permits and regulations. Because water from the nearby Calcasieu River Industrial Canal would be used to perform the hydrostatic testing of the LNG storage tanks, the inside of the tank walls would be cleaned using a clean, clear power-wash to remove any silt particles that may adhere to the inner walls of the LNG storage tank. The power-wash would be conducted in accordance with vendor specifications. Typically, a small boat is installed in the tank's interior prior to the start-up of the test. The small boat would float up with the rising water level. When emptying of the tank is about to begin, an operator gets in the boat and power-washes the sides of the tank as the water level recedes. Magnolia does not anticipate the use of any biocides or additives to the hydrostatic test water.

1.5.4.6 Site Restoration

Magnolia has prepared preliminary drafts of the Project-specific Upland Erosion Control, Revegetation, and Maintenance Plan (Plan) and Wetland and Waterbody Construction and Mitigation Procedures (Procedures) based, respectively, on the FERC's Revised Upland Erosion Control, Revegetation, and Maintenance Plan and Wetland and Waterbody Construction and Mitigation Procedures, dated May 31, 2013. The Project-specific Plan and Procedures are provided in Appendix 2.C of RR 2, "Water Use and Quality."

Magnolia LNG's Project-specific Plan and Procedures call for appropriate erosion control and soil stabilization including post construction planting of grasses. Because the entire construction area (114 acres) would also be used during operations, no planting of native trees or similar activities to restore original site grades or vegetative communities is proposed. Following soil stabilization and grass planting, the Project site outside of the developed infrastructure would consist of grassy surfaces, such as a upland meadow where vegetation is maintained in a graminaceous or weedy state due to mowing activities. Once finalized, the Project-specific Plan and Procedures for site restoration would be submitted to the Commission for review and approval by the Director of the Office of Energy Projects.

1.5.4.7 Pipeline Interconnect

Feed gas would be transported to the site via an existing 42-inch interstate gas pipeline owned by KMLP that passes directly through the Project site. The KMLP pipeline crosses beneath the Project site and can be accessed without crossing outside the property boundary. The 42-inch KMLP pipeline traverses the southern portion of the site as shown on Figure 1.1-5. A tie-in would enable the pipeline to be connected to the Gas Gate Station within the Project site boundary, via an approximately 75-foot-long interconnect gas pipeline.

Once the tie-in procedure has been completed, KMLP would construct the interconnect pipeline and route the interconnect pipeline to the Gas Gate Station approximately 75 feet away. KMLP's system modifications to accommodate the Project will require a separate filing by KMLP with the FERC under Section 7(c) of the NGA (refer to Section 1.13, "Transportation of the Feed Gas to the Magnolia LNG Project"). On January 28, 2014, Magnolia executed a

binding Precedent Agreement with KMLP for firm natural gas transportation service up to 1,400,000 dekatherms per day (Dth/d), sufficient to satisfy the full 8 mtpa capacity of the Magnolia LNG Project. The Precedent Agreement served as Magnolia's binding bid in KMLP's recent open season for the Lake Charles Project, through which Magnolia was awarded its full 1,400,000 Dth/d bid.

The interconnect pipeline would be made of carbon steel pipe, manufactured in accordance with API and/or ASME specifications. Pipelines would be designed to comply with USDOT safety regulations contained in 49 CFR Part 192 and USDOT safety design regulations.

1.5.4.8 Construction Site Drainage

During construction, land is susceptible to erosion and sedimentation as a result of storm events and construction activities. Magnolia has prepared a draft site-specific construction SWPPP⁹, including best management practices (BMPs) to prevent mobilization of soil particles during construction and to capture those particles that do become mobilized and entrained in stormwater during rain events (see Appendix 2.E in RR 2). Magnolia would perform construction activities in accordance with the FERC's Plan and federal and state requirements and would implement BMPs including silt fencing, sediment barriers, and washdown areas to remove soil from vehicles before they exit the site.

During construction, stormwater runoff would be directed to designated, graded catchment areas within the site. The water would then drain into a catch basin which would overflow via a concrete overflow. The locations of these areas would be determined during FEED. The overflow would occur in a controlled manner and would drain into the Industrial Canal. Undisturbed areas of the site would retain their existing natural drainage.

1.5.4.9 Materials and Equipment Delivery and Off-site Concrete Batch Plant

Depending on size, weight, and origin of the material/equipment, equipment would be delivered either directly to the site via ground transportation utilizing local highway routes or by barge via the existing unloading dock, operated by DII, within the modular building yard immediately to the east of the Project site. An estimated 20 to 30 barge trips would be required to transport equipment to the site (LNG trains and LNG tank inner walls).

⁹ The LPDES is authorized under the USEPA's delegated NPDES program (which is authorized under the Clean Water Act) and promulgated through LAC Title 33:XI.2503. A water quality certification is required for all projects that obtain a coastal use permit or a Section 404/10 permit.

The LPDES Stormwater Permit Program is administered through LDEQ under LAC 33:IX.2511.B. For construction activities that disturb 5 acres of land or more, for applicable activities (clearing, grading, and excavation for construction activities), a Notice of Intent (Form NOI CSW-G) for LPDES Stormwater General Permit LAR100000 must be submitted to LDEQ detailing activities and discharges. The activities and discharges must be protective of threatened and endangered species, cultural resources, and TMDL limits on receiving waterbodies, and the requirements of the SWPPP must be met. Coordination with the LDWF and the Louisiana SHPO will be required to discharge stormwater from the proposed Project site. This coordination is typically conducted in coordination with the Section 404/10 permit and the WQC required under Section 10 of the Clean Water Act.

A preliminary estimate of approximately 5,000 pre-stressed concrete pilings would be required to create the foundations for the LNG storage tanks (3,016 pilings) and other process equipment foundations and structures. Pilings for the Project would be shipped via barge from one or more precast concrete pile vendors. One local vendor stated that 150 precast concrete pilings could be loaded on each barge and four barges could be pushed by a single tug on each delivery voyage. As such, concrete piling deliveries would require about nine additional marine deliveries consisting of a tug boat with four barges in the tow.

Additional marine deliveries would be required for steel sheet pile for the mooring basin, pilings for the LNG loading platform, pilings for the mooring dolphins, specialized marine mooring equipment, and the rock armoring to protect the base of the steel sheet pile seawall and mooring equipment. An additional six to eight marine deliveries (tug and barge combinations) could be required for these marine components and materials. Five additional tug and barge combination deliveries are anticipated for miscellaneous components and construction materials. In total, Magnolia estimates 50 or fewer marine deliveries during construction of the Project.

The volume of concrete required for the Project would be provided by an off-site existing concrete batch plant located within a 3- to 5-mile radius of the site. Concrete would be delivered by road in concrete trucks. Currently, Magnolia is in conversations with several concrete batch plant providers in the vicinity of the Project site. Among possible suppliers of concrete for the Project is the Dunham Price concrete batch facility located on West Lincoln Road, near the Lakes Charles airport, about 5 miles east of the Project site. Dunham Price is considered the largest supplier of aggregates and concrete in Southwest Louisiana. Estimates of the Project's roadway construction traffic are discussed in RR 5, "Socioeconomics."

1.6 OPERATIONS AND MAINTENANCE

All Project operations and maintenance (O&M) personnel would be trained to properly and safely perform their assigned duties and responsibilities. Operators would be trained in the handling of potential hazards associated with LNG, cryogenic operations, and the proper operations of all the equipment. The operators would meet all the training requirements of the USCG, the USDOT, the Louisiana State Fire Marshall, and other regulatory entities, as well as the requirements of the Project.

Magnolia would develop and implement an Operations Execution Plan (OEP) that describes the operational approach and activities through engineering, procurement, construction, commissioning, start-up and into the operational phase of the Project.

The main objectives of the OEP are:

- to align operations and management, in order to achieve the Project objectives;
- to ensure focus on start-up and initial operation; and
- to provide a list of activities that require addressing during design through to commissioning.

The OEP would describe the activities required to achieve “right-first-time” approach for the life of the Project.

The Project’s full-time maintenance staff would conduct routine maintenance and minor overhauls. Major overhauls and other major maintenance would be handled by bringing in maintenance contractors’ personnel specifically trained to perform the required services. All scheduled and unscheduled maintenance would be entered into a computerized maintenance management system.

Personnel requirements must enable a high level of safety for both production and maintenance, and would include positions such as:

- Plant Manager
- Marine Operations Manager
- Operations Manager
- Maintenance Manager
- Shift Supervisors
- Field Operators
- Control Room Operators
- Instrument/Electrical/Mechanical Technicians
- Health, Safety and Environment Manager
- Tug crews and Dock crews
- Materials Coordinator
- CMMS Scheduler
- Plus others

There are estimated to be 67 Magnolia site personnel once the facility is operating at full LNG capacity of 8 mtpa. As an extension to the core operations and maintenance team of 67 site personnel, specialty third-party contractors would be contracted periodically to assist with maritime operations and scheduled preventative maintenance of the facility. Furthermore, due to the nature of shift work and periodic LNG vessel/trucking operations, approximately 45 site personnel are expected to be on-site during the day hours. During night hours, this would be reduced further when some of the administration, maintenance, and other site personnel depart the site. Appendix A.1 in Resource Report 13, “Engineering and Design Material,” contains an organizational chart for the operations and maintenance phase.

1.7 SAFETY

The Project facilities would be designed, constructed, operated, and maintained in strict accordance with PHMSA Federal Safety Standards for Liquefied Natural Gas Facilities, 49 CFR Part 193. In addition, the Project would be designed to meet all USCG standards in 33 CFR Part 127, Waterfront Facilities Handling Liquefied Natural Gas and Liquefied Hazardous Gas. The facilities would also meet the NFPA 59A LNG Standards. Safety controls and the role they play are addressed in more detail in RR 11, “Reliability and Safety.”

1.7.1 Spill Containment

The LNG and MR spill containment systems for the Project would be designed and constructed to comply with USDOT - Federal Safety Standards for Liquefied Natural Gas Facilities (49 CFR Part 193); USCG - Waterfront Facilities Handling Liquefied Natural Gas and Liquefied Hazardous Gas (33 CFR Part 127); Standard for the Production, Storage, and Handling of Liquefied Natural Gas (NFPA 59A- Applicable versions of this standard are incorporated in 49 CFR 193 (per § 193.2013); and all other applicable federal and state regulations. These regulations require that each LNG container and each LNG transfer system be provided with a means of secondary containment sized to hold the quantity of LNG that could be released as a result of the design spill appropriate for the area and LNG equipment.

The regulations also require transfer and storage areas for flammable refrigerants and flammable liquids be graded, drained, or provided with impoundment in a manner that minimizes the possibility of accidental spills and leaks that could endanger important structures, equipment, or adjoining property or that could reach waterways.

1.7.2 Thermal Exclusion and Vapor Dispersion Zones

The LNG storage tanks proposed for the Project must comply with the USDOT's siting requirements at 49 CFR Part 193, subpart B which incorporates the 2001 edition of the NFPA 59A. As specified in 49 CFR Part 193.2057, thermal radiation protection requires that each LNG container and LNG transfer system have thermal exclusion zones based on three radiation flux levels in accordance with Section 2.2.3.2 of NFPA 59A.

The thermal exclusion zones are designed to protect people and property in the event of an accident and fire at a LNG facility. For the proposed Project, exclusion zone distances for various heat flux levels associated with the LNG storage tanks were calculated according to 49 CFR 193.2057 and section 2.2.3.2 of NFPA 59A, using the "LNGFIRE III" computer program model developed by the Gas Research Institute. Thermal radiation distances were determined for 1,600, 3,000, and 10,000 British thermal units per square foot per hour (Btu/ft²-hr) incident heat flux levels for a fire from the full impoundment area surrounding the two proposed LNG storage tanks. The 1,600 Btu/ft²-hr heat flux level is associated with an exposed person experiencing burns within about 30 seconds. At 3,000 Btu/ft²-hr, an exposed person would experience burns within 10 seconds; however, a wooden structure would not be expected to burn in that time and would afford protection to sheltered persons. At 10,000 Btu/ft²-hr, clothing and wood can ignite spontaneously. These thermal exclusion zone distances and the corresponding land use restrictions are shown in Table 1.7-1.

The thermal exclusion zone calculations were based on the finalized LNG storage tank dimensions detailed in RR 13. As the engineering design for the Project is still progressing and detailed weather analysis has not yet been performed, the final exclusion zone calculations may vary slightly. However, it is believed that, based on the current stage in the engineering design, these distances would not vary by more than 5 percent.

Table 1.7-1 Preliminary Magnolia LNG Thermal Exclusion Zones

Source	Exclusion Area NFPA 59A Section 2-2.3.2(a)	Incident Flux (Btu/ft ² -hr)	Exclusion Zone (feet)
LNG storage tank impoundment	Outdoor assembly area occupied by 50 or more people.	1,600	951
LNG storage tank impoundment	Off-site structures used for occupancies or residences.	3,000	744
LNG storage tank impoundment	Property line that can be built upon.	10,000	403

Source: Daughdrill 2013.

Magnolia plotted the NFPA 59A thermal exclusion zones for the proposed Project on a geo-referenced map that also contained the Project site boundaries and the 2012 LCZ boundary. This information is included and discussed in detail in RR8, “Land Use Recreation and Aesthetics.”

Vapor dispersion exclusion zones would be calculated for the proposed Project facilities as required by 49 CFR Part 193.2057 and 193.2059 using the models approved by PHMSA.

For additional information about thermal exclusion and vapor dispersion calculations, please refer to RR 11, “Reliability and Safety.”

1.7.3 Hazard Detection System

Hazard detectors for the Project would be installed throughout the facilities to give operations personnel a means for early detection and location of released flammable gases and fires. The hazard detection system would be designed in accordance with NFPA requirements and other applicable standards. The hazard detection systems would consist of the following:

- combustible gas
- fire and flame
- leak detection system
- high temperature
- low temperature
- smoke detectors
- toxic detectors

The hazard detection systems would be hard-wired to the main control system for alarm. Area gas detectors would be provided to monitor flammable gases. Low temperature sensors would be located at the spill impoundment basin to shut down and/or prevent the stormwater pumps from starting in the event of an LNG spill. Ultraviolet/infrared fire and flame detectors also would be located throughout the LNG terminal, and high temperature detectors would be located to detect a fire on the vent pipes of the LNG storage tank relief valves. The toxic

detectors would detect ammonia, CO₂, and hydrogen sulfide and would be calibrated appropriately depending where in the plant they are located and what material they are calibrated to detect (refer to RR 11 for additional information).

1.7.4 Hazard Control System

Several different types of fire suppression agents would be available for fighting fires within the Project facilities. The type of agent that would be used in a specific situation would depend on the characteristics of a particular event and on the relative effectiveness of the various agents for that particular type of fire. Hazard control systems would consist of the following:

- firewater system
- high expansion foam system
- sprinkler, water spray, and deluge systems
- portable and wheeled fire extinguishers
- fail safe shutdown system
- security system

1.7.5 Firewater System

The Project would include firewater supply and distribution systems for extinguishing fires, cooling structures and equipment exposed to thermal radiation, and dispersing flammable vapors. Additionally, hydrants, hose reel, and fixed monitors would be strategically located for the Project (see RR 11, “Reliability and Safety”).

The firewater system would be designed in accordance with NFPA requirements. The proposed source of water supply for the firewater system would be from on-site aboveground tanks. The tanks would be filled using groundwater from the groundwater wells. The deluge system for the LNG storage tanks would access water from the Industrial Canal surface water by using pumps. Refer to Section 2.2.4, “Water Use,” for additional information on the LNG tanks deluge system.

Refer to Section 1.1.12.2, “Water Supply and Sewage Handling,” for water supply requirement information. Refer to RR 11, “Reliability and Safety,” for additional details on the firewater system.

1.7.6 High-Expansion Foam System

High-expansion foam concentrate would be metered or proportioned into the firewater system by means of a typical balanced pressure foam proportioning system. The resulting foam solution would be delivered via underground piping to the high-expansion foam generator installed in the LNG spill impoundment sump. The high-expansion foam generator, Angus or equivalent, would be water-motor powered, thus, no electrical power would be required. The foam generator would produce nominal 500:1 high-expansion foam, i.e., 500 parts air for every part foam solution. This foam would be applied to LNG spills, whether ignited or un-ignited. Applied to ignited spills, the foam would control the fire, greatly reducing the level of radiant

heat to the surroundings. The high-expansion foam systems would be designed in accordance with NFPA 11A.

1.7.7 Fail Safe Shutdown System

The Project facilities would have an ESD system with shutdown and control devices designed to leave the facilities in a safe state. The ESD system would be used for major incidents and would result in either total plant shutdown, shutdown of processes, and/or individual pieces of equipment, depending on the type of incident.

1.7.8 Security

The LNG facility would be subject to facility security regulations under the USCG Maritime Transportation Security Act (33 CFR Part 105) and would have a facility security plan approved by the USCG. The LNG facility would meet all necessary security measures required under those regulations including security fencing, lighting, access control, and CCTV. In addition, PHMSA regulations concerning transportation of hazardous materials would be evaluated and any applicable PHMSA security requirements not otherwise covered by the USCG-approved Facility Security Plan would be implemented.

The Project facilities would include sirens that would be audible in all locations per USCG LNG facility regulations (33 CFR 127). The sirens would have a distinctive tone for easy recognition between alarms and emergency events.

Plant security would include a perimeter fence consistent with established Port protocol. Access through the plant gate and buildings would be consistent with the requirements of the USCG-approved Facility Security Plan. CCTV cameras would permit viewing of the entrance area and other locations around and within the plant including tank top and LNG vessel loading platform. Guard houses would be strategically located at certain locations along Henry Pugh Boulevard to monitor activities.

1.8 FUTURE PLANS AND ABANDONMENT

At this time, Magnolia has no future plans which would result in the expansion of the currently proposed Project facilities. If an expansion is ever envisioned in the future, Magnolia would seek the appropriate authorization from federal, state, and local agencies. Magnolia envisions a 30-year life for the Project. However, the facilities themselves would, with proper maintenance, be capable of being operated for 50 years or more. Regardless of the duration of utilization of the proposed Project facilities, Magnolia would obtain the necessary permission to abandon its facilities in accordance with regulations that exist at the time of abandonment and any landowner requirements.

1.9 CUMULATIVE IMPACT ANALYSIS

Cumulative impacts are the collective result of the incremental impacts of an action that, when added to the impacts of other past, present, and reasonably foreseeable future actions,

would affect the same resources, regardless of what agency or person undertakes those actions (40 CFR 1508.7). Cumulative impacts can result from actions that have individually minor impacts but that collectively impose significant impacts over a period of time. Compliance with the National Environmental Policy Act (NEPA) requires an analysis of cumulative impacts (40 CFR 1508.25(a)(2) and 40 CFR 1508.25(c)(3)). The FERC considers a reasonably foreseeable action to be a future action that has a realistic expectation of occurring. These include (but are not limited to) actions under analysis by a regulatory agency, proposals being considered by state or local planners, plans that have begun implementation, or future actions that have been funded.

For this cumulative effects analysis, reasonably foreseeable future development was considered in the context of specific proposals as well as general trends in the region. Past actions were considered in the baseline evaluation of impacts. To identify specific proposals that might impose cumulative environmental effects in the region, Magnolia sought information on specific projects, developments, or activities with potential impacts that would overlap in timeframe or geographically with those of the proposed Project.

Magnolia identified projects by contacting regulatory and planning boards and through publicly available information. The projects were screened for review using a standard of 1) having submitted a site plan for review by a local planning agency or government agency, 2) an application submitted to a regulatory agency for permit review, 3) available press releases, and 4) within approximately 50 miles of the Project. In many cases, the limited availability of detailed information about future projects, actions, or facilities requires qualitative assessments of potential cumulative impacts. Evaluating the potential cumulative impacts of in-progress and proposed projects creates an unavoidable level of uncertainty. Projects can be delayed, abandoned, or altered between the time they are announced and the time they are completed or abandoned.

The timeframes for each reasonably foreseeable future development project were further defined as proposed, in permitting, and under construction. For each proposed project, Magnolia attempted to verify information about the project or its impacts, otherwise it was not evaluated further. In addition, Magnolia's resource experts identified expected environmental effects of reasonably foreseeable future development projects based on publically available information or using professional judgment and experience with similar projects. Table 1.9-1 identifies the locations, timeframes, general scope, and expected environmental effects of each reasonably foreseeable future development project. The projects are organized in the following general categories: industrial, commercial, and residential developments. Figure 1.9-1 shows the locations of the projects.

The timeframe for the Magnolia LNG Project, as described in Section 1.5.1, "Schedule" (also see Appendix 1.D), calls for construction to begin in mid-2015 with operation by June 2018 for Train 1 and operation of all four trains in early 2019. As a result of the preliminary review of the timeframe for each project in Table 1.9-1, a number of projects were not evaluated further: projects completed (considered part of the baseline), projects that would not overlap in time with the Magnolia LNG Project, and projects proposed or with an unknown timeframe.

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
Industrial – Gas/Chemical/Gas-to-Liquids (GTL)						
1	Sabine Pass LNG Export Terminal (Cheniere Energy, Inc.)	Cameron Parish	41.9	Under Construction as of 2013; Operation estimated 2015/2016 for trains 1 and 2 and 2016/2017 for trains 3 and 4. Permitting was initiated for trains 5 and 6 in early 2013.	<ul style="list-style-type: none"> ▪ Six new liquefaction trains, each with nominal capacity of approximately 4.5 million tons per annum (mtpa) (approximately 0.5 bcf/day each). ▪ 3,000 construction jobs, 77 retained jobs, 356 new permanent direct jobs (206 new/150 resident contractors), 589 new permanent indirect jobs, \$100,000 avg. salary. ▪ \$11 billion capital investment. ▪ Cheniere Creole Trail Pipeline, L.P. (CCTPL) would add approximately 98.7 miles of pipeline, including two loops (Loop 1 and Loop 2), an extension, three laterals, and a new compressor station. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://www.cheniere.com/lng_industry/sabine_pass_liquefaction.shtml. ▪ http://energy.gov/sites/prod/files/2013/07/f2/Summary_of_Export_Applications.pdf. ▪ http://www.ferc.gov/whats-new/comm-meet/2013/022113/C-7.pdf. ▪ http://www.cheniere.com/CQP_documents/Landowner_Letter.pdf. 	<ul style="list-style-type: none"> ▪ New and maintenance dredging ▪ New ballast water ▪ Additional marine traffic ▪ Groundwater use during construction; municipal water during operations ▪ Additional security vessels that temporarily prohibit recreational use ▪ Major air emission source ▪ Noise during construction ▪ Addition of new large LNG storage tanks ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
2	Lake Charles Export, LLC (Trunkline LNG Company, LLC)	Lake Charles, Calcasieu Parish	0.5	In Permitting. Construction expected to begin 2015; Operation to begin in 2019.	<ul style="list-style-type: none"> ▪ Natural gas liquefaction project with a capacity of approximately 15 million tons per annum (mtpa) (approximately 2 bcf/day each). ▪ Several thousand construction jobs, 100 new operation phase jobs. 	<ul style="list-style-type: none"> ▪ New and maintenance dredging ▪ New ballast water in the Industrial Canal ▪ Additional marine traffic ▪ Groundwater use during construction;

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					<ul style="list-style-type: none"> ▪ \$5.7 billion capital investment. As part of the project, Trunkline LNG’s interstate natural gas pipeline would be extended approximately 0.5 mile to provide feed gas to the liquefaction facility. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://www.panhandleenergy.com/lakeCharles/lc_regulatory.asp ▪ http://energy.gov/sites/prod/files/2013/07/f2/Summary_of_Export_Applications.pdf ▪ http://elibrary.ferc.gov:0/idmws/file_list.asp?document_id=14197485 	<ul style="list-style-type: none"> ▪ municipal water during operations ▪ Additional security vessels that temporarily prohibit recreational use ▪ Major air emission source ▪ Noise during construction ▪ Addition of new large LNG storage tanks ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
3	Cameron LNG, LLC	Hackberry, LA, Lake Charles Harbor and Terminal District property, Cameron Parish	4.9	In Permitting. Construction planned 2014; operation in 2017.	<ul style="list-style-type: none"> ▪ Three liquefaction trains with a nameplate of 4.5 MTPA of capacity each, 13.5 MTPA total. In addition, a new 21-mile natural gas pipeline, a compressor station, and proposed modifications to existing pipeline interconnection. ▪ 130 new jobs/60 retained, 610 indirect jobs/3,100 construction jobs, \$80,000 average salary and benefits. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://cameron.sempralng.com/liquefaction.html ▪ http://energy.gov/sites/prod/files/2013/07/f2/Summary_of_Export_Applications.pdf 	<ul style="list-style-type: none"> ▪ New and maintenance dredging ▪ New ballast water ▪ Additional marine traffic ▪ Groundwater use during construction; municipal water during operations ▪ Additional security vessels that temporarily prohibit recreational use ▪ Major air emission source ▪ Noise during construction ▪ Addition of new large LNG storage tanks ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
4	Golden Pass LNG	Sabine Pass, Texas		In Permitting Expected operation in 2019	<ul style="list-style-type: none"> ▪ Expansion of existing facility for export of 15.6 million tons of LNG per year (approximately 2 bcf/day). The new facility would be built on existing Golden Pass 	<ul style="list-style-type: none"> • New and maintenance dredging • New ballast water in the Industrial Canal

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					<p>property and utilize the existing state-of-the-art tanks, berths and pipeline infrastructure. New facilities for natural gas pre-treatment and liquefaction would be constructed.</p> <ul style="list-style-type: none"> ▪ Pipeline upgrades will include installation of approximately 8 miles of 30- to 36-inch pipeline and installation of additional compressor stations. <p>Source:</p> <ul style="list-style-type: none"> ▪ http://goldenpassproducts.com/index.cfm/page/8 	<ul style="list-style-type: none"> • Additional marine traffic • Groundwater use during construction; municipal water during operations • Additional security vessels that temporarily prohibit recreational use on the Sabine River • Major air emission source • Noise during construction • Addition of new large LNG storage tanks • Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
5	Waller Point LNG (Waller Energy Holdings, LLC and Waller LNG Services, LLC)	Entrance of the Calcasieu Ship Channel, Cameron Parish	22.0	Proposed	<ul style="list-style-type: none"> ▪ Plan to export domestically produced LNG of approximately 1.3 mtpa (approximately 0.2 bcf/day) up to the equivalent of 58.4 Bcf of natural gas per year to Free Trade Agreement (FTA) countries using a proprietary floating storage tank (NO92 Membrane) at the facility. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://www.marinelink.com/news/terminal-facility-develop349173.aspx ▪ http://marinelog.com/index.php?option=com_content&view=article&id=3196:waller-marine-to-develop-small-scale-lng-terminals&catid=1:latest-news&Itemid=195 ▪ http://www.fossil.energy.gov/programs/gas/regulation/authorizations/2012_application 	<ul style="list-style-type: none"> ▪ New and maintenance dredging ▪ New ballast water ▪ Additional marine traffic ▪ Groundwater use during construction; municipal water during operations ▪ Additional security vessels that temporarily prohibit recreational use ▪ Potentially major air emission source ▪ Noise during construction ▪ Addition of new large LNG storage tanks ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					s/Waller LNG Services, LLC 12-152-LNG .html <ul style="list-style-type: none"> http://www.fossil.energy.gov/programs/gasregulation/authorizations/2013_application_s/13_153_LNG.pdf 	
6	Gasfin Development USA, LLC	Along the Calcasieu River, Cameron Parish	20.8	Proposed	<ul style="list-style-type: none"> Received long-term authorization from DOE to export to FTA countries approximately 1.5 mtpa (approximately 0.2 bcf/day) up to 74 Bcf per year of natural gas domestically produced LNG from a proposed mid-scale natural gas liquefaction and LNG export terminal. <p>Sources:</p> <ul style="list-style-type: none"> http://www.gasfin.net/ http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=2&ved=0CC4QFjAB&url=http%3A%2F%2Fwww.fossil.energy.gov%2Fprograms%2Fgasregulation%2Fauthorizations%2FOrders_Issued_2013%2Ford3253.pdf&ei=PmcvUv-DPKnkyQGd64GwBg&usq=AFQjCNGIOtGSUY0hU_bGCaGk38wJVn5hFw&bvm=bv.51773540,d.aWc 	<ul style="list-style-type: none"> New and maintenance dredging New ballast water Additional marine traffic Groundwater use during construction; municipal water during operations Additional security vessels that temporarily prohibit recreational use Potentially major air emission source Noise during construction Addition of new large LNG storage tanks
7	Venture Global LNG, LLC	Along the Calcasieu River, Cameron Parish	22.8	Proposed	<ul style="list-style-type: none"> Export of approximately 5 mtpa (approximately 0.7 bcf/day) up to 244 Bcf per year of natural gas domestically produced LNG from a proposed mid-scale natural gas liquefaction and LNG export terminal. 	<ul style="list-style-type: none"> New and maintenance dredging, new ballast water Additional marine traffic Groundwater use during construction; municipal water during operations Additional security vessels that temporarily prohibit recreational use Major air emission source

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					Sources: <ul style="list-style-type: none"> ▪ http://venturegloballng.com/ ▪ http://www.fossil.energy.gov/programs/gasregulation/authorizations/2013_application/Venture_Global_LLC_-_13-69-LNG1.html 	<ul style="list-style-type: none"> ▪ Noise during construction ▪ Addition of new large LNG storage tanks
8	Sasol North America, Inc. - Westlake GTL Plant	Westlake, Calcasieu Parish	9.8	Proposed Expected operation in 2019 (phase one) and 2020 (phase two)	<ul style="list-style-type: none"> ▪ GTL facility that will convert natural gas into diesel. Sources: <ul style="list-style-type: none"> ▪ http://www.sasollouisianaprojects.com/page.php?page=Gas-To-LiquidsFacility ▪ http://www.louisianaeconomicdevelopment.com/page/sasol 	<ul style="list-style-type: none"> ▪ Major air emission source ▪ Converting existing land use to industrial use ▪ Noise and traffic during construction and operations ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
9	Sasol North America Inc. - Lake Charles Chemical Complex	Westlake, Calcasieu Parish	10.1	In Permitting. Operations expected 2017.	<ul style="list-style-type: none"> ▪ Expansion of existing facilities with an ethane cracker facility, 650-acre site near Sasol's existing facilities in Westlake, LA. ▪ 350 retained jobs, 1,289 new jobs, 5,886 indirect, 7,000 construction jobs, \$89,000 average salary and benefits. Source: <ul style="list-style-type: none"> ▪ http://www.sasollouisianaprojects.com/page.php?page=World-scaleethanecracker 	<ul style="list-style-type: none"> ▪ Major air emission source ▪ Converting of existing land use to industrial ▪ Noise and traffic during construction and operations ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
10	Lake Charles Clean Energy LLC (Leucadia)	Lake Charles, Calcasieu Parish	5.7	Under Construction; expected operation in 2017	<ul style="list-style-type: none"> Facility to convert petroleum coke to methanol. Annual payroll expenditures of \$340 million over the three-year construction period; 200 new full-time jobs, 3,000 construction jobs. <p>Sources:</p> <ul style="list-style-type: none"> http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%209%204%2013.pdf http://energy.gov/nepa/downloads/eis-0464-epa-notice-availability-final-environmental-impact-statement 	<ul style="list-style-type: none"> Major air emission source Converting existing land use to industrial use Noise and traffic during construction and operations Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
11	Westlake Chemical Corporation	Lake Charles, Calcasieu Parish	5.9	Under Construction	<ul style="list-style-type: none"> Expansion of Petro 2 ethylene unit at existing facility to increase ethane-based ethylene capacity by approximately 230 to 240 million pounds annually in support of the company's ethylene integration strategy. 400 construction jobs, 5 new jobs, 393 retained jobs. <p>Source:</p> <ul style="list-style-type: none"> http://westlake.com/fw/main/default.asp?DocID=68&reqid=1773152 	<ul style="list-style-type: none"> Major air emission source Converting existing land use to industrial use Noise and traffic during construction and operations
12	G2X Energy	Lake Charles, Calcasieu Parish	0.5	In Permitting. Construction expected 2015; operations by 2018.	<ul style="list-style-type: none"> \$1.3 billion natural gas-to-gasoline facility will produce 12,500 barrels per day of 87 octane gasoline using methanol-to-gasoline technology licensed from ExxonMobil Research and Engineering. 	<ul style="list-style-type: none"> New and maintenance dredging Additional marine traffic Groundwater use during construction; municipal water during operations

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					<ul style="list-style-type: none"> ▪ 1,000 construction jobs, 748 indirect jobs, 243 new jobs, \$66,500 per year plus benefits. ▪ G2X has filed for an air permit with the LDEQ and USEPA and for a permit with the U.S. Army Corps of Engineers. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://g2xenergy.com/press/governor-jindal-highlights-g2x-energy-plans-for-1-3-billion-natural-gas-to-gasoline-facility-in-southwest-louisiana/ ▪ http://www.smartenergyuniverse.com/alternative-energy/11320-g2x-energy-plans-1-3-billion-natural-gas-to-gasoline-facility-in-southwest ▪ http://g2xenergy.com/plants/ ▪ http://www.americanpress.com/The-eight-petrochemical-companies-fueling-upcoming-economic-boom 	<ul style="list-style-type: none"> ▪ Major air emission source ▪ Noise and traffic during construction and operations ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
13	Juniper GTL, LLC	Westlake, Calcasieu Parish	8.9	Proposed	<ul style="list-style-type: none"> ▪ \$100 million investment at the existing steam methane reformer to convert the facility for gasoline production. ▪ Estimated 29 jobs created; average salary of \$85,000 per year with benefits, 112 indirect jobs. <p>Source:</p> <ul style="list-style-type: none"> ▪ http://www.areadevelopment.com/newsletters/9-5-2013/juniper-gtl-renovation-calcasieu-parish-louisiana489242.shtml 	<ul style="list-style-type: none"> ▪ Major air emission source ▪ Noise and traffic during construction and operations ▪ Workforce (new jobs); use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
14	BP Biofuels	Jennings, Jefferson Davis Parish	39.5	Completed	<ul style="list-style-type: none"> ▪ BP operates a 1.4 million gallon cellulosic demonstration facility in Jennings and is considering expansion to produce 30 million gallons of alternative fuel annually. ▪ \$400 million capital investment and 75 to 100 new jobs. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20report%209%204%2013.pdf ▪ http://www.bp.com/sectiongenericarticle.do?categoryId=9030047&contentId=7055177 	<ul style="list-style-type: none"> ▪ Potential major air emission source ▪ Noise and traffic during construction and operations
Industrial – Other						
15	Kinder Morgan Louisiana Pipeline	Lake Charles, Calcasieu Parish/ Eunice, Acadia Parish	0.00 and 52.4	Permitting	<ul style="list-style-type: none"> ▪ Modifying existing delivery meter facilities to make them bidirectional; the installation of compression facilities near Eunice, LA, and the delivery facilities at the proposed Magnolia liquefaction facility interconnect. <p>Source: Precedent Agreement between Magnolia LNG and KMLP</p>	<ul style="list-style-type: none"> • Potential major air emission source • Noise and traffic during construction • Workforce (new jobs); use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
16	Northrop Grumman	Lake Charles, Calcasieu Parish	11.2	Completed	<ul style="list-style-type: none"> ▪ New 800,000+ square feet hangar at the Lake Charles Maintenance and Modification Center (LCMMC) as part of a larger 1,050-acre aircraft modification center located at Chennault Airport. ▪ \$3.6 million capital investment. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://www.northropgrumman.com/Capabilities/LakeCharlesMaintenanceCenter/Pages/default.aspx ▪ http://www.gov.state.la.us/index.cfm?md=newsroom&tmp=detail&articleID=3373 	<ul style="list-style-type: none"> ▪ Minor air emission source ▪ Noise and traffic during construction and operations ▪ Capital investments and tax revenue
17	W.R. Grace & Company	Sulphur, Calcasieu Parish	4.2	Completed	<ul style="list-style-type: none"> ▪ Chemical plant in Sulphur, LA. ▪ \$150-million investment. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://www.siteselection.com/issues/2013/mar/ip-swloisiana.cfm ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf 	<ul style="list-style-type: none"> ▪ Major air emission source ▪ Noise and traffic during construction and operations ▪ Use of public services; tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
18	PSI Midstream Partners, L.P.	Cameron Parish	31.0	Proposed	<ul style="list-style-type: none"> ▪ Changes to the existing 500-MMcfd gas processing plant located near Johnson Bayou in Cameron Parish. ▪ \$15-million investment and 20 additional construction jobs. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://www.siteselection.com/issues/2013/mar/ip-swloisiana.cfm ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf ▪ http://www.psimidstream.com/latest-news/ 	<ul style="list-style-type: none"> ▪ Potential new emissions ▪ Noise and traffic during construction and operations ▪ Workforce requirements (new jobs); use of public services; capital investments and tax revenue
19	West Calcasieu Port	West Calcasieu Port, Calcasieu Parish	4.1	Completed	<ul style="list-style-type: none"> ▪ \$2.3 million investment for 800 linear feet of barge basin shoreline for an additional 25 to 30 barge slips. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf ▪ http://www.westcalport.com/PressRoom/PressRoomDisplay.asp?p1=5664&p2=Y 	<ul style="list-style-type: none"> ▪ Air emissions from barges and tugs ▪ Noise and traffic during construction and operations ▪ Capital investments

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
20	Talon Midstream L.P.	Westlake, Calcasieu Parish	8.8	Proposed	<ul style="list-style-type: none"> ▪ An industrial plant for pipeline and related structures. ▪ \$250 million investment, 250 additional construction jobs, 30 new jobs. <p>Sources:</p> <ul style="list-style-type: none"> ▪ http://www.siteselection.com/issues/2013/mar/ip-swloisiana.cfm ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf 	<ul style="list-style-type: none"> ▪ Potential new air emissions ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
Commercial, including Entertainment and Hotels						
21	HRI Properties	Lake Charles, Calcasieu Parish	9.6	Proposed	<ul style="list-style-type: none"> ▪ 150-room, six-story hotel. ▪ \$19 million capital investment. <p>Source:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20projects%20%20report%20detailed%20updated%209.4.13.pdf 	<ul style="list-style-type: none"> ▪ Minor construction and operating emissions ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
22	Golden Nugget (formerly Pinnacle Entertainment, Inc. / Ameristar Casinos, Inc.)	Lake Charles, Calcasieu Parish	6.7	Under Construction. Opening 2014	<ul style="list-style-type: none"> ▪ Hotel expansion adjacent to the L'Auberge Casino Resort. ▪ 1,800 construction jobs, 1,500 new jobs, \$400 to \$500 million capital investment. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20projects%20%20report%20detailed%20updated%209.4.13.pdf 	<ul style="list-style-type: none"> ▪ Minor construction and operating emissions ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					<ul style="list-style-type: none"> ▪ 2-2018%20swla%20detailed%20projects%20report%208%2022%2013%20.pdf 	
23	Hampton Inn	Lake Charles, Calcasieu Parish	7.2	Completed	<ul style="list-style-type: none"> ▪ New 85-room hotel near the cross section of Holly Hill and Prien Lake Roads. <p>Source:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report (February 3, 2014): http://allianceswla.org/ 	<ul style="list-style-type: none"> ▪ Minor construction and operating emissions ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Workforce and housing requirements (new jobs); use of public services; capital investments and tax revenue
24	Coushatta Casino Resort	Kinder, Allen Parish	41.6	Completed 2012	<ul style="list-style-type: none"> ▪ Seven-story, \$60 million hotel expansion at the Coushatta Casino Resort added 400 new rooms. ▪ 1,000 construction jobs, 150 permanent employees. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20report%208%2022%2013%20.pdf ▪ http://www.coushattacasinoresort.com/media/140/ 	<ul style="list-style-type: none"> ▪ Minor construction and operating emissions ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Workforce requirements; use of public services; tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
25	L'Banca Albergo Hotel	Lake Arthur, Jefferson Davis Parish	37.2	Completed	<ul style="list-style-type: none"> ▪ New 8-room hotel. ▪ \$500,000 capital investment. ▪ 8 to 10 new jobs <p>Source:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/ February 3, 2014 SWLA report 	<ul style="list-style-type: none"> ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Use of public services; tax revenue
26a	SOWELA Technical Community College	Lake Charles, Calcasieu Parish	10.8		<ul style="list-style-type: none"> ▪ Industrial Training Facility to initially support workforce needs during construction and operations of the new Sasol plants and to serve the broader needs of growing manufacturers throughout the region. ▪ \$20 million investment. <p>Source:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20report%208%2022%2013%20.pdf 	<ul style="list-style-type: none"> ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Workforce and housing requirements (housing requirement minor); use of public services; capital investments and tax revenue
26b	SOWELA Technical Community College	Lake Charles, Calcasieu Parish	10.8	Under Construction. Expected to be completed in March 2014.	<ul style="list-style-type: none"> ▪ Nursing and Allied Health Building project. ▪ \$8.8 million investment. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20report%208%2022%2013%20.pdf 	<ul style="list-style-type: none"> ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Workforce and housing requirements (housing requirement minor); use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					<ul style="list-style-type: none"> ▪ http://www.sowela.edu/chancellor.asp 	
27	Southwest Louisiana Entrepreneuria I and Economic Development (SEED) Center	Lake Charles, Adjacent to the McNeese State University campus, Calcasieu Parish	6.7	Operating	<ul style="list-style-type: none"> ▪ 32-office, 50,000-square-foot building. ▪ An incubator for startup and existing small businesses and will provide counseling and mentoring services to boost economic development in the region. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf ▪ http://www.gov.state.la.us/index.cfm?md=newsroom&tmp=detail&articleID=4200 	<ul style="list-style-type: none"> ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Use of public services; tax revenue
28	Mardi Gras Boardwalk	Lake Charles, Calcasieu Parish	9.5	Proposed. Expect construction in 2014.	<ul style="list-style-type: none"> ▪ \$50.4 million capital investment in former Harrah's property including 135 hotel rooms, restaurants, and shops. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf ▪ http://www.americanpress.com/Informer-2-2-14 	<ul style="list-style-type: none"> ▪ Minor construction and operating emissions ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction ▪ Workforce and housing requirements; use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
29	Chennault International Airport/New Hanger	Lake Charles, Calcasieu Parish	11.3	Under Construction	<ul style="list-style-type: none"> ▪ Airport expansion project that will add a new 112,000- to 115,000-square-foot maintenance and repair hangar. ▪ 500 new jobs. <p>Source:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/ February 3, 2014 SWLA report. 	<ul style="list-style-type: none"> ▪ Workforce and housing requirements; use of public services; capital investments and tax revenue
30	Farmers Rice Milling Co.	Lake Charles, Calcasieu Parish	12.1	Unknown	<ul style="list-style-type: none"> ▪ \$13.4 million capital investment to expand mill with an additional 55,000 square feet and use of robots. ▪ Some temporary construction jobs. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/ February 3, 2014 SWLA report. ▪ http://wwwprd1.doa.louisiana.gov/LaNews/PublicPages/Dsp_PressRelease_Display.cfm?PressReleaseID=3384&Rec_ID=0 ▪ http://www.foodmanufacturing.com/news/2013/01/rice-mill-plans-134m-expansion 	<ul style="list-style-type: none"> ▪ Minor construction and operating emissions ▪ Converting existing land use to commercial use ▪ Noise and traffic during construction and operations ▪ Workforce and housing requirements; use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
31	Scope Technologies, Inc.	near the McNeese campus, Lake Charles, Calcasieu Parish	6.5-7	Unknown	<ul style="list-style-type: none"> ▪ Testing facility for the ES 25 Energy Saver, transformer based power voltage optimizer that connects to incoming electric power supply. ▪ 7 to 15 new jobs created in phase 1, 30 to 45 people with phases 2 and 3 expansions; 32 indirect jobs. <p>Source:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/ February 3, 2014 SWLA report. 	<ul style="list-style-type: none"> ▪ Workforce and housing requirements; use of public services; capital investments and tax revenue
32	Zagis Expansion	Lacassine, Jefferson Davis Parish	22.9	Unknown	<ul style="list-style-type: none"> ▪ 50,000 square foot expansion of the Zagis cotton spinning plant. ▪ 30 new jobs/60 retained jobs. <p>Source:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/ February 3, 2014 SWLA report. 	
33	Boise's DeRidder Paper Mill	Beauregard Parish	52.2	Proposed	<ul style="list-style-type: none"> ▪ \$111 million to upgrade the existing paper mill. ▪ 54 new direct jobs/444 retained, 222 new indirect jobs, an estimated 600 construction jobs. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/ February 3, 2014 SWLA report. 	<ul style="list-style-type: none"> ▪ Potential new operating emissions ▪ Workforce and housing requirements; use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					<ul style="list-style-type: none"> ▪ http://www.louisianaeconomicdevelopment.com/index.cfm/newsroom/detail/248 ▪ http://www.beauregarddailynews.net/article/20131001/NEWS/130939965 	
	Residential					
34	Belle Savanne	Sulphur, Calcasieu Parish (Sulphur/Carlyss area)	9.3	Under Construction.	<ul style="list-style-type: none"> ▪ Mixed residential and commercial development of initial 27 acres expanding to about 300 acres comprised of about 1,200 lots. ▪ \$60 million capital investment, future plans for \$25 million dollars of infrastructure, expected housing construction expenditures of approximately \$210 million. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf ▪ http://www.mvn.usace.army.mil/Portals/56/docs/regulatory/publicnotices/MVN_2013_01439_WPP_PNALL.pdf 	<ul style="list-style-type: none"> ▪ Minor emissions during construction ▪ Additional vehicle traffic ▪ Workforce and housing requirements (minor); use of public service (minor); capital investments and tax revenue
35	Lakes at Morganfield	Lake Charles, Calcasieu Parish	8.3	Proposed	<ul style="list-style-type: none"> ▪ Mixed residential and commercial development, initially of 110 home sites, expanding to 600 to 700 homes over a five- to eight-year period. ▪ \$350 million capital investment. ▪ 277.4 acres of land located off La. Highway 14. 	<ul style="list-style-type: none"> ▪ Minor emissions during construction ▪ Additional vehicle traffic ▪ Workforce requirements; use of public services; capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					Source: <ul style="list-style-type: none"> SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf 	
36	Pelican Lodge Workforce Housing	East side of Lake Charles (near Chenault)	8.2	Under Construction. Operation by mid-2015.	<ul style="list-style-type: none"> An industrial employee housing facility that will hold up to 4,000 workers on 200 acres of Port of Lake Charles property. 400 construction jobs, \$70 million. Sources: <ul style="list-style-type: none"> SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf http://www.americanpress.com/Work-starting-on-Lake-Area-employee-village 	<ul style="list-style-type: none"> Minor emissions during construction Additional vehicle traffic Workforce requirements; use of public services; capital investments and tax revenue
37	Walnut Grove Development	Lake Charles, Calcasieu Parish	7.7	Under Construction	<ul style="list-style-type: none"> Mixed-use community of 180 residential properties and commercial facilities on 60 acres on the west end of Sallier Street down from the Port of Lake Charles. It is expected that the development would be completed by 2020. Source: <ul style="list-style-type: none"> SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20%20report%208%2022%2013%20.pdf 	<ul style="list-style-type: none"> Minor emissions during construction Additional vehicle traffic Workforce requirements; use of public services; capital investments and tax revenue
38	Willow Brook	Near	3.0	Proposed	<ul style="list-style-type: none"> 138 single-family, 1,600- to 2,500-square- 	<ul style="list-style-type: none"> Minor emissions during construction

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
		Graywood, Calcasieu Parish			<p>foot homes on 30 acres.</p> <p>Source:</p> <ul style="list-style-type: none"> SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20report%208%2022%2013%20.pdf 	<ul style="list-style-type: none"> Additional vehicle traffic Workforce requirements; use of public services; capital investments and tax revenue
39	D R Horton	Graywood, Calcasieu Parish	2-3	Proposed	<ul style="list-style-type: none"> 15 homes. <p>Source:</p> <ul style="list-style-type: none"> SWLA Project Report: http://allianceswla.org/Images/Interior/2012-2018%20swla%20detailed%20projects%20report%208%2022%2013%20.pdf 	<ul style="list-style-type: none"> Minor emissions during construction Additional vehicle traffic Use of public services (minor); tax revenue
Government Facilities						
40	Louisiana Marine Fisheries Enhancement, Research, and Science Center	Lake Charles, Calcasieu Parish	0.1	Proposed	<ul style="list-style-type: none"> Louisiana Department of Wildlife and Fisheries proposed \$22 million research and enhancement of marine fisheries and long-term monitoring of fishery resource, production of spotted seatrout, red drum, and southern flounder. Three 0.5-acre ponds for propagation and research, a water reservoir with pipeline and water intake station, and an effluent pump station. <p>Sources:</p> <ul style="list-style-type: none"> E-mail communication of July 24, 2013, from Duet, Jason with Louisiana Wildlife and Fisheries to William Daughdrill of Ecology and Environment, Inc. 	<ul style="list-style-type: none"> Minor emissions during construction Workforce requirements; use of public services (minor); capital investments and tax revenue

Table 1.9-1 Regional Projects Identified for Consideration in the Cumulative Impacts Analysis for the Magnolia LNG Project

	Project (Owner)	Location	Distance from Site (miles)	Timeframe	Description	Expected Environmental Effects
					<ul style="list-style-type: none"> ▪ http://www.gulfspillrestoration.noaa.gov/wp-content/uploads/Fish_Hatchery_Factsheet_finalproof.pdf 	
41	National Hurricane Museum and Science Center	Lake Charles (across Bord du Lac Drive from the Civic Center)	9.1	Proposed	<ul style="list-style-type: none"> ▪ \$66 million capital investment ▪ Still in the fundraising stage; in May 2013, the Port of Lake Charles came to an agreement to give the museum \$3 million. <p>Sources:</p> <ul style="list-style-type: none"> ▪ SWLA Project Report: http://allianceswla.org/ February 3, 2014 SWLA report. ▪ http://www.cityoflakecharles.com/egov/apps/document/center.egov?view=item&id=695 ▪ http://www.nhmsc.com/project-research 	<ul style="list-style-type: none"> ▪ Minor emissions during construction

- Industrial – Gas/Chemical/Gas-to-Liquids (GTL)**
- 1 - Sabine Pass LNG Export Terminal (Cheniere Energy, Inc.)
 - 2 - Trunkline LNG, LLC - Lake Charles Export Terminal
 - 3 - Cameron LNG, LLC
 - 4 - Golden Pass LNG
 - 5 - Waller Point LNG
 - 6 - Gasfin Development USA, LLC
 - 7 - Venture Global LNG, LLC
 - 8 - Sasol North America, Inc. - Westlake GTL Plant
 - 9 - Sasol North America, Inc. - Lake Charles Chemical Complex
 - 10 - Lake Charles Clean Energy LLC - Leucadia
 - 11 - Westlake Chemical Corporation
 - 12 - G2X Energy
 - 13 - Juniper GTL, LLC
 - 14 - BP Biofuels
- Industrial – Other**
- 15 - Kinder Morgan Louisiana Pipeline
 - 16 - Northrop Grumman
 - 17 - W.R. Grace & Company
 - 18 - PSI Midstream Partners, L.P.
 - 19 - West Calcasieu Port
 - 20 - Talon Midstream L.P.
- Commercial, including Entertainment and Hotels**
- 21 - HRI Properties
 - 22 - Golden Nugget
 - 23 - Hampton Inn
 - 24 - Coushatta Casino Resort
 - 25 - L'Banca Albergo Hotel
 - 26 - SOWELA Technical Community College
 - 27 - Southwest Louisiana Entrepreneurial and Economic Development (SEED) Center
 - 28 - Mardi Gras Boardwalk
 - 29 - Chennault International Airport/New Hanger
 - 30 - Farmers Rice Milling Co.
 - 31 - Scope Technologies, Inc.
 - 32 - Zagis Expansion
 - 33 - Boise's DeRidder Paper Mill
 - 34 - Belle Savanne
 - 35 - Lakes at Morganfield
 - 36 - Pelican Lodge Workforce Housing
 - 37 - Walnut Grove Development
 - 38 - Willow Brook
 - 39 - D. R. Horton
- Recreational Facilities**
- 40 - Louisiana Marine Fisheries Enhancement, Research, and Science Center
 - 41 - National Hurricane Museum & Science Center

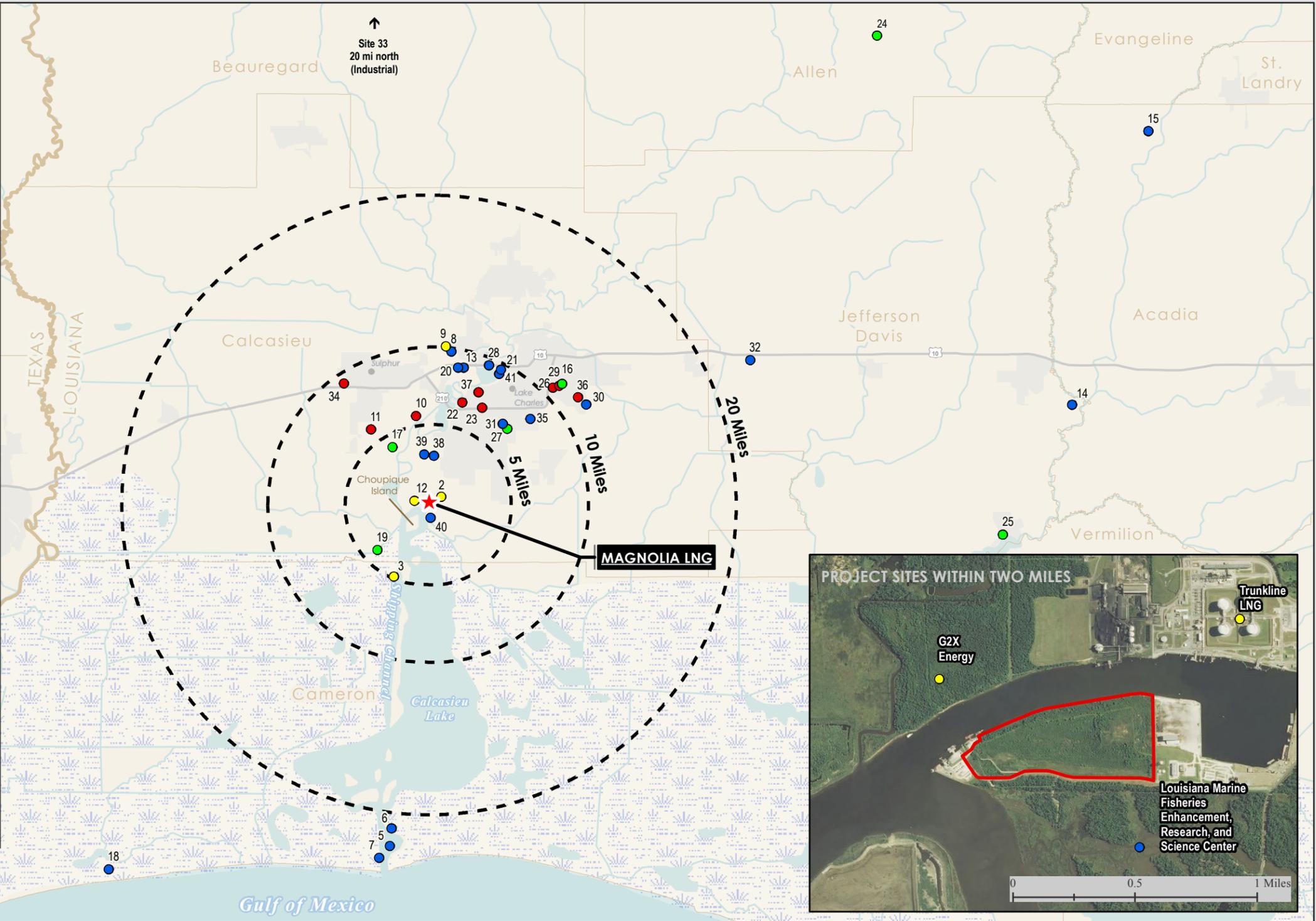


Figure 1.9-1
Projects Considered in the
Cumulative Impact Analysis
 Magnolia LNG
 Calcasieu Parish, Louisiana

Legend

- ★ Magnolia LNG Site
- ⊞ Magnolia Site Buffer
- ▭ Proposed Magnolia LNG Site (inset)

Timeframe

- Proposed/Unknown
- In Permitting
- Under Construction
- Completed/Operating

0 5 10 Miles
 1:470,000

Source- ESRI 2012, NAIP 2013
 Image Date- 08/27/2013
 Date: 4/27/2014

MAGNOLIA LNG

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The proposed Louisiana Marine Fisheries Enhancement, Research, and Science Center, planned immediately southeast of the Project site (see Section 1.1.3), is the closest to the Project site of all the projects listed in Table 1.9-1. On February 6, 2014, a meeting was held with Jason Duet and Craig Gothreaux with the Louisiana Department of Wildlife and Fisheries (LDWF) regarding the Fisheries Research Center to gather additional information about the proposed facility, including the timing for its construction.¹⁰ The LDWF anticipates that it will be at least four years before they break ground on the research center. So far, the LDWF has completed a high-level concept study of the center, started an environmental assessment of the project, and initiated coordination efforts with state and federal regulatory agencies to determine what permits are required. During the meeting, it was stated that funding for the project came from the Louisiana Oil Spill Coordinator's office as an early Natural Resources Damage Assessment (NRDA) project (paid for through early NRDA funding provided by BP as a result of the Gulf of Mexico Macondo oil spill in April 2010) and they would turn the project over to the State Office of Facility Planning. Facility Planning would then issue the Request for Proposal (RFP) for the design of the facility; once the facility is designed, they would issue bids for construction. The current Magnolia LNG construction schedule (see Appendix 1.D) calls for all dredging to be completed in the first quarter of 2016. Due to the length of the permitting, design, and construction process, the water intake structure for the proposed Louisiana Marine Fisheries Enhancement, Research, and Science Center is not expected to be operational during dredging and construction activities of the proposed Magnolia LNG Project. Therefore, it is not included in the cumulative impacts analysis.

The following reasonably foreseeable projects were evaluated further depending on the level of information available. The numbers listed here correspond to the numbers in Table 1.9-1 and on Figure 1.9-1:

1. Sabine Pass LNG Export Terminal (Cheniere Energy, Inc.)
2. Trunkline LNG, LLC, Lake Charles Export Terminal (Trunkline LNG project)
3. Cameron LNG, LLC
4. Golden Pass LNG
9. Sasol North America Inc. - Lake Charles Chemical Complex
10. Lake Charles Clean Energy LLC
11. Westlake Chemical Corporation
12. G2X Energy
15. Kinder Morgan Louisiana Pipeline
34. Belle Savanne

Detailed discussions of the cumulative impacts that the identified projects and the Magnolia LNG Project would have on each applicable environmental resource is provided in the appropriate Resource Reports.

¹⁰ Meeting Minutes, Magnolia LNG Meeting with LDWF, Office of Fisheries (J. Duet and C. Gothreaux), regarding the proposed Fisheries Research Center (February 6, 2014).

The analyses consider the incremental impacts of the proposed Project and non-jurisdictional components that when added to the impacts of other past, present, and reasonably foreseeable future actions would affect the same resources in the same timeframe within the same geographic boundary. The geographic boundary for each resource area is restricted to areas around where the resource could be affected by the proposed Project or non-jurisdictional components and by the presence of the resource. For example, the geographic boundary for overlapping air quality impacts during construction would be within 0.5 mile of the proposed Project and during operation would be the Area of Impact determined by modeling to obtain the required state and federal permits for the Project.

Each Resource Report briefly summarizes the incremental minor or greater impacts from the proposed Project or non-jurisdictional components and the expected environmental effects of the reasonably foreseeable future projects identified in Table 1.9-1. The impacts were evaluated collectively to produce a description of the potential combined or cumulative environmental effects.

1.10 PERMITS AND APPROVALS

Construction, operation, and maintenance of the Project facilities would be in accordance with all applicable rules and regulations, permits, and approvals. Applicable permits and approvals for the Project facilities are summarized in Appendix 1.E along with the schedule for filing of all major permits or appropriate documentation.

Major permit and approval actions for the Project involving multiple regulatory agencies would include environmental reviews by the FERC for authorization of the liquefaction facilities under Section 3 of the NGA; the U.S. Department of Energy (DOE) for authorization to export LNG to both Free Trade Agreement (FTA) countries and non-FTA countries; the USACE for activities affecting wetlands and waterways; the USCG's approval of the WSA; and the LDEQ for a permit to authorize air emissions under the Clean Air Act.

On December 18, 2012, as part of the Project development, Magnolia filed an application with the DOE, Office of Fossil Energy to export up to 4 mtpa of LNG to countries that currently have, or in the future will have, an FTA with the United States. On February 26, 2013, DOE approved Magnolia's request to export 4 mtpa of LNG to FTA countries in its own right and/or as agent for others for selected LNG tolling parties and LNG buyers.

On October 11, 2013, Magnolia filed an application with the DOE, Office of Fossil Energy, to export up to 8 mtpa of LNG to countries that do not have an FTA with the United States requiring national treatment for trade of natural gas and LNG, which have or in the future develop the capacity to import LNG via ocean-going carrier, and with which trade is not prohibited by U.S. law or policy (i.e., non-FTA countries). The DOE approved this request on March 5, 2014, in DOE/FE Order No. 3406. Magnolia also filed an application with the DOE, Office of Fossil Energy, which was docketed on October 15, 2013, for export of an additional 4 mtpa of LNG to countries that currently have, or in the future will have, an FTA with the United States in order to represent the full production capacity of the Project. Magnolia's non-FTA application notice was officially published in the *Federal Register* on March 24, 2014 (Volume

79, No. 56, page 15980), triggering the opening of the 60-day comment period, which will close on May 23, 2014.

Finally, with regard to the fourth factor, federal control is determined by the amount of federal financing, assistance, direction, regulation, or approval inherent in a project. The non-jurisdictional facilities associated with the Magnolia LNG Project would be developed without federal financing or guarantees. Magnolia is a private company and the non-jurisdictional facilities would be constructed by private companies under state and local regulatory jurisdiction. Some federal permits may be involved, but no federal lands are involved. Therefore, this factor does not support a review of the non-jurisdictional facilities.

1.11 AGENCY AND PUBLIC COMMUNICATIONS

Magnolia has commenced discussions with relevant local, state, and federal agencies. An open house for the proposed Project occurred on May 2, 2013, at the Pujoe Street Café Banquet Room, 901 Ryan Street, Lake Charles, Louisiana 70601.

In compliance with 18 CFR § 157.206(d)(2), Magnolia sent written notifications to all landowners identified within 0.5 mile of the proposed facilities within three business days following the Commission's Notice of Application. The names and mailing addresses of landowners within 0.5 mile of the Project site are listed in Appendix 1.F and the appendix has been marked as "*PRIVILEGED*."

Commencing in November 2012, Magnolia held either group or one-on-one meetings with the following agencies and organizations to provide information about the Project:

- FERC, Washington, DC
- DOE, Washington, DC
- USACE, New Orleans, Louisiana
- USFWS, Lafayette, Louisiana
- National Oceanic and Atmospheric Administration, National Marine Fisheries Service, Baton Rouge, Louisiana
- USCG Captain of the Port, Port Arthur, Texas
- USCG Marine Safety Unit, Lake Charles, Louisiana
- LDEQ, Baton Rouge, Louisiana
- Louisiana Department of Natural Resources (LDNR), Baton Rouge, Louisiana
- LDNR, Office of Conservation, Baton Rouge, Louisiana
- Louisiana Office of Cultural Development (State Historic Preservation Officer), Baton Rouge, Louisiana
- LDWF, Baton Rouge, Louisiana
- LDWF, Louisiana Natural Heritage Program, Baton Rouge, Louisiana
- Louisiana Economic Development, Baton Rouge, Louisiana
- Louisiana Department of Transportation and Development, Baton Rouge, Louisiana
- Southwest Louisiana Economic Development Alliance, Lake Charles, Louisiana
- Lake Charles Pilots Association, Lake Charles, Louisiana

- Lake Area Industry Alliance (LAIA)
- Lake Charles City Council, Lake Charles, Louisiana
- Southwest Louisiana (SWLA) Safety Council, Sulphur, Louisiana
- SWLA Construction Users Council, Lake Charles, Louisiana
- SWLA Economic Development Alliance, Lake Charles, Louisiana
- SWLA Economic Development Alliance, Workforce Development, Lake Charles, Louisiana
- Calcasieu Parish Office of Homeland Security and Emergency Preparedness (OHSEP), Lake Charles, Louisiana
- Calcasieu Parish Police Jury, Lake Charles, Louisiana
- Calcasieu Parish Sheriff's Office, Lake Charles, Louisiana
- Lake Charles City Council, Lake Charles, Louisiana
- City of Lake Charles, Lake Charles, Louisiana
- Lake Charles Fire Department, Lake Charles, Louisiana
- Lake Charles Public Works, Lake Charles, Louisiana

Appendix 1.G includes the lists of federal, state, and local stakeholders, as well as businesses and other organizations with which Magnolia has communicated about the Project.

1.12 FERC NON-JURISDICTIONAL FACILITIES

Non-jurisdictional facilities are those facilities that are related to the Project for the purpose of delivering, receiving, or using the proposed natural gas volumes, and include facilities to be built and owned by other companies, that are not subject to FERC's jurisdiction. The FERC non-jurisdictional facilities associated with the Project include tying-in to portable water and power service, as described below.

FERC has adopted a four-part test to determine whether there is sufficient federal control and responsibility over a project as a whole to warrant environmental analysis of non-jurisdictional facilities. These factors are:

1. Whether or not the regulated activity comprises "merely a link" in a corridor type project (such as a transportation or utility transmission project);
2. Whether there are aspects of the non-jurisdictional facility in the immediate vicinity of the regulated activity which uniquely determine the location and configuration of the regulated activity;
3. The extent to which the entire project will be within FERC's jurisdiction; and
4. The extent of cumulative federal control and responsibility.

The application of this test to the non-jurisdictional facilities associated with the Project demonstrates that there is not a need for FERC to conduct an environmental review of these non-jurisdictional facilities.

With regard to the first factor, the proposed Project is not a corridor type project or a link in a corridor type project. Therefore, this factor does not support a review of the non-jurisdictional facilities.

With regard to the second factor, there are no aspects of the non-jurisdictional facilities that affect the location and configuration of the Project. Therefore, this factor does not support a review of the non-jurisdictional facilities.

With regard to the third factor, the non-jurisdictional facilities are entirely outside of FERC's jurisdiction as the construction of these facilities is under the jurisdiction of the State of Louisiana regulatory agencies and local regulators, as applicable. Therefore, this factor does not support a review of the non-jurisdictional facilities.

1.12.1 Tie-in to Potable Water Service

The Calcasieu Parish District 12 Water Works would provide potable water service. An existing 12-inch water pipeline runs along the entire length of the property just north of Henry Pugh Boulevard. It is expected that this existing 12-inch water pipeline would be sufficient for the Project's potable water needs. No permits are required except for permission to interconnect to the Calcasieu Parish District 12 Water Works. The proposed tie-in location to the 12-inch water pipeline is shown on Figure 1.1-8.

1.12.2 Tie-in to Power Transmission Line

1.12.2.1 Transmission Line and Switching Station Scope of Work

Entergy would provide the base-load power required by the Project. The scope of work needed to serve the Project's power service requirements would include constructing:

- a new 230-kV Ring Bus Switching Station on the Project site. This new substation would be sourced via an in/out cut-in on the Graywood-to-Solac Line (L-609); and
- a new double-circuit 230-kV line of about 1.3 miles between the tap point on L-609 and the new substation.

1.12.2.2 Description of Transmission Line Work Proposed

At full plant nominal capacity of 8 mtpa, the Project is expected to import a base load of approximately 26 MW during normal operating hours (24/7). An additional maximum of 5 MW of power (totaling approximately 31 MW) is expected to be imported from the electrical grid when loading LNG carriers and LNG barges. Power supply to the proposed Project would require a tie-in to the 230-kV transmission line and construction of an incoming feeder to the Project site. Entergy would provide the base-load power required by the Project. Magnolia anticipates requesting from Entergy a total base load of approximately 31 MW. Based on the anticipated Project demand for power from the electrical grid, a load flow analysis was conducted by Entergy to determine options for providing the required total base load requested

by Magnolia. Based on the analysis performed, Entergy determined that there would be no need for upgrading the local transmission system to accommodate the proposed load addition. Figure 1.12-1 shows the existing nearby transmission facilities operated by Entergy.

To deliver the requested base-load power requested by Magnolia, the service proposed by Entergy includes providing a new double-circuit 230-kV transmission line service to the Project site and Entergy would also permit, construct, own, operate and maintain the 230-kV/13.8-kV substation within the Project site. No permits have been applied for by Entergy at this time. Entergy transmission line routing would begin at the Graywood substation at the northeast corner of West Lincoln and Big Lake Roads. It would cross to the south side of West Lincoln Road and proceed west to the Big Lake Road intersection. At the Lincoln and Big Lake Roads intersection, the transmission line would turn south and follow existing right-of-way (ROW) on the east side of Big Lake Road. At the intersection of Henry Pugh Boulevard, the 230-kV line, following the existing ROW, would cross Big Lake Road and follow the Henry Pugh Boulevard ROW on its south side and continue in a westerly direction past Calcasieu Parish District 12 Water Works. From a point on the east side of the Project site, the 230-kV line would turn north crossing over Henry Pugh Boulevard to the new Entergy Magnolia substation within the planned Magnolia LNG Project site.

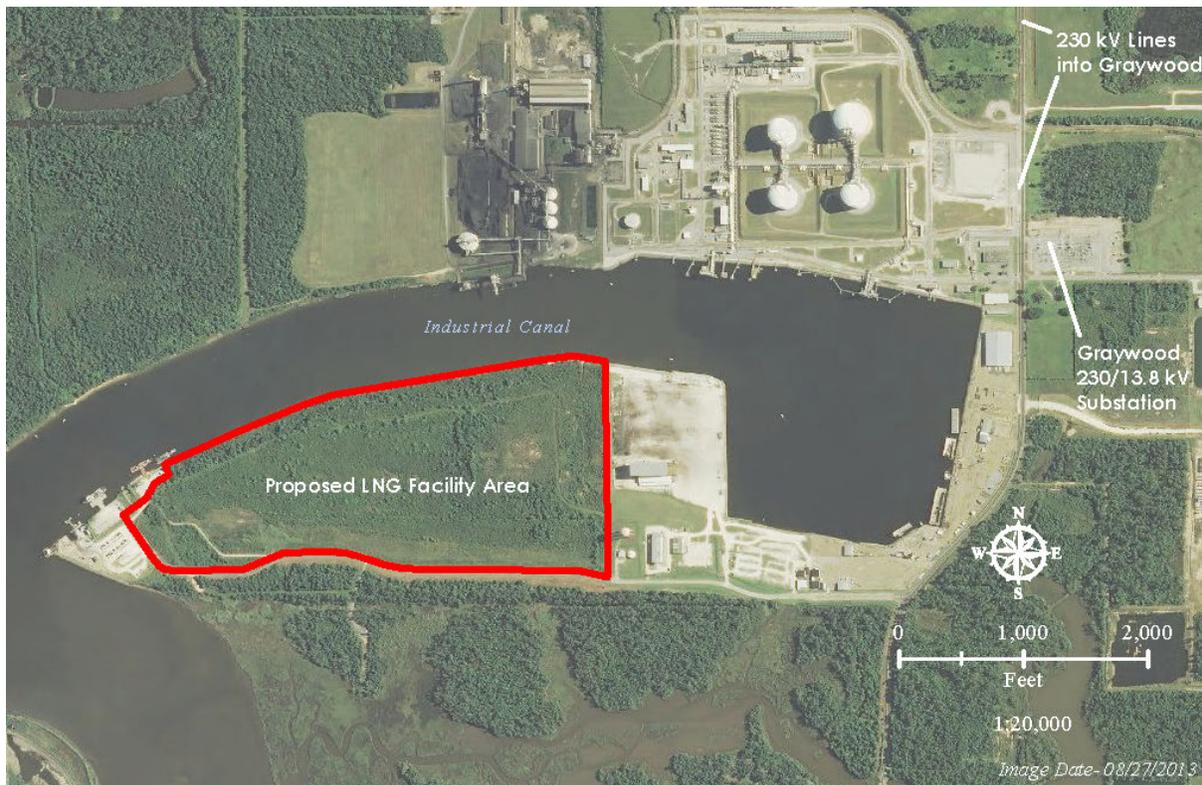


Figure 1.12-1 Site Location with Existing Nearby Transmission Facilities

The new 230-kV transmission line from the Graywood substation to the Magnolia LNG Project site would be approximately 1.3 miles in length. The poles supporting the transmission line wires would be 90 to 110 feet in height, spaced approximately 600 feet apart or as determined during final design. Initial design calls for a right-of-way width of 170 feet. The new right-of-way for the 230-kV transmission line would be adjacent to, or possibly overlap, the existing roadway and utility rights-of-way on Lincoln and Big Lake Roads and Henry Pugh Boulevard. Preparation of the right-of-way would require cutting and clearing of existing trees that might otherwise constitute a hazard to the transmission lines.

The Entergy Magnolia substation would contain the following items:

- Two (2) 230-kV line breakers
- One (1) 230-kV bus tie breaker
- 230-kV switches
- Switchgear
- Electrical relaying
- Communications medium
- Two (2) 230-kV/13.8-kV voltage transformers
- Low side metering (13.8 kV)
- Remote terminal unit (RTU)
- Station service transformer (distribution voltage)
- Control house

Figure 1.12-2 is an aerial view of the Graywood substation, while Figure 1.12-3 illustrates the routing of the new double-circuit 230-kV line and the configuration of the new switching station within the planned Project site.



Figure 1.12-2 Graywood Substation

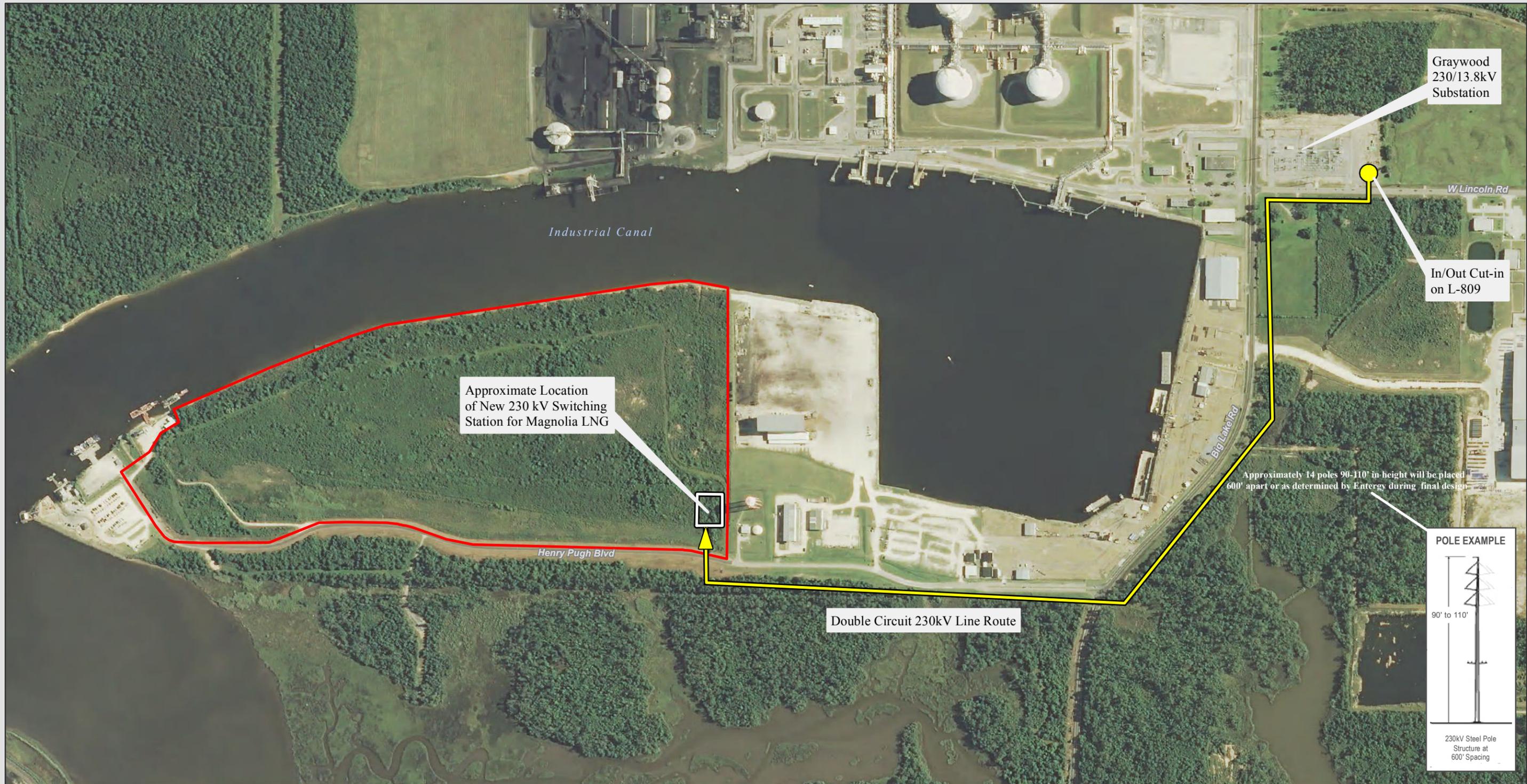
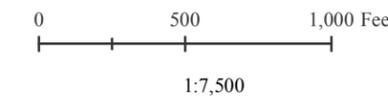


Figure 1.12-3
Proposed Routing of the
230-kV Transmission Line
 Magnolia LNG
 Calcasieu Parish, Louisiana

-  Proposed Substation
-  Proposed LNG Facility Boundary
-  Proposed Entergy Transmission Line



Source- ESRI 2011, NAIP 2013
 Image Date- 08/27/2013
 Date: 4/23/2014

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1.13 TRANSPORTATION OF FEED GAS TO THE MAGNOLIA LNG PROJECT

Feed gas would be transported to the site boundary via an existing 42-inch interstate gas pipeline owned by KMLP that passes directly through the project site. The KMLP pipeline can be accessed within the Project site boundary. A short interconnect pipeline of approximately 75 feet and a metering station would be located entirely within the Project site to tie-in the existing underground pipeline to the Gas Gate Station.

The construction and operation of the facilities required to transport the feed gas to the Project will require a separate filing by KMLP with the FERC under Section 7(c) of the NGA. A binding precedent agreement was executed on January 28, 2014, between KMLP and Magnolia (refer to Section 1.5.4.7, “Pipeline Interconnect” for additional information). The precedent agreement generally describes that the facilities to provide the services associated with the supply of feed gas would consist of: (a) construction of a new interconnect and lateral facilities, including any required metering facilities, to connect the proposed Magnolia LNG terminal to KMLP’s line; (b) modification of certain of KMLP’s existing interconnections for primary receipt, which would require that such interconnections be reconfigured as bidirectional points; and (c) adding compression facilities to move sufficient quantities of natural gas in the reverse direction of current flows as shown on Figure 1.13-1. The modifications to the existing KMLP system could include the following as depicted on Figure 1.13-2:

- The existing delivery meter with Columbia Gulf Transmission (CGT) would be modified to be bidirectional such that it can both receive and deliver gas at CGT.
- The existing delivery meter with Texas Gas Transmission (TGT) would be modified to be bidirectional such that it can both receive and deliver gas at TGT.
- The existing delivery meter with ANR Pipeline Company (ANR) would be modified to be bidirectional such that it can both receive and deliver gas at ANR.
- The existing TGT and ANR meter sites would be connected to a new 1.5-mile header pipeline which would feed into a new compressor station to be located near Eunice, Louisiana (Eunice C/S). The Eunice C/S also would be connected to KMLP’s mainline such that it could compress gas received from CGT for delivery to the Magnolia liquefaction interconnect.
- The new KMLP Eunice C/S’s preliminary design calls for 64,000 horsepower, consisting of four Solar Mars 100 turbine compressor units for the full 8 mtpa output capacity. A split suction header design would allow for dual inlet pressures to facilitate efficient use of the compression facilities and reduce fuel consumption, as well as offer additional operational flexibility (refer to RR 9 for additional information).
- The new metering facilities to be installed by KMLP at the Magnolia LNG site.

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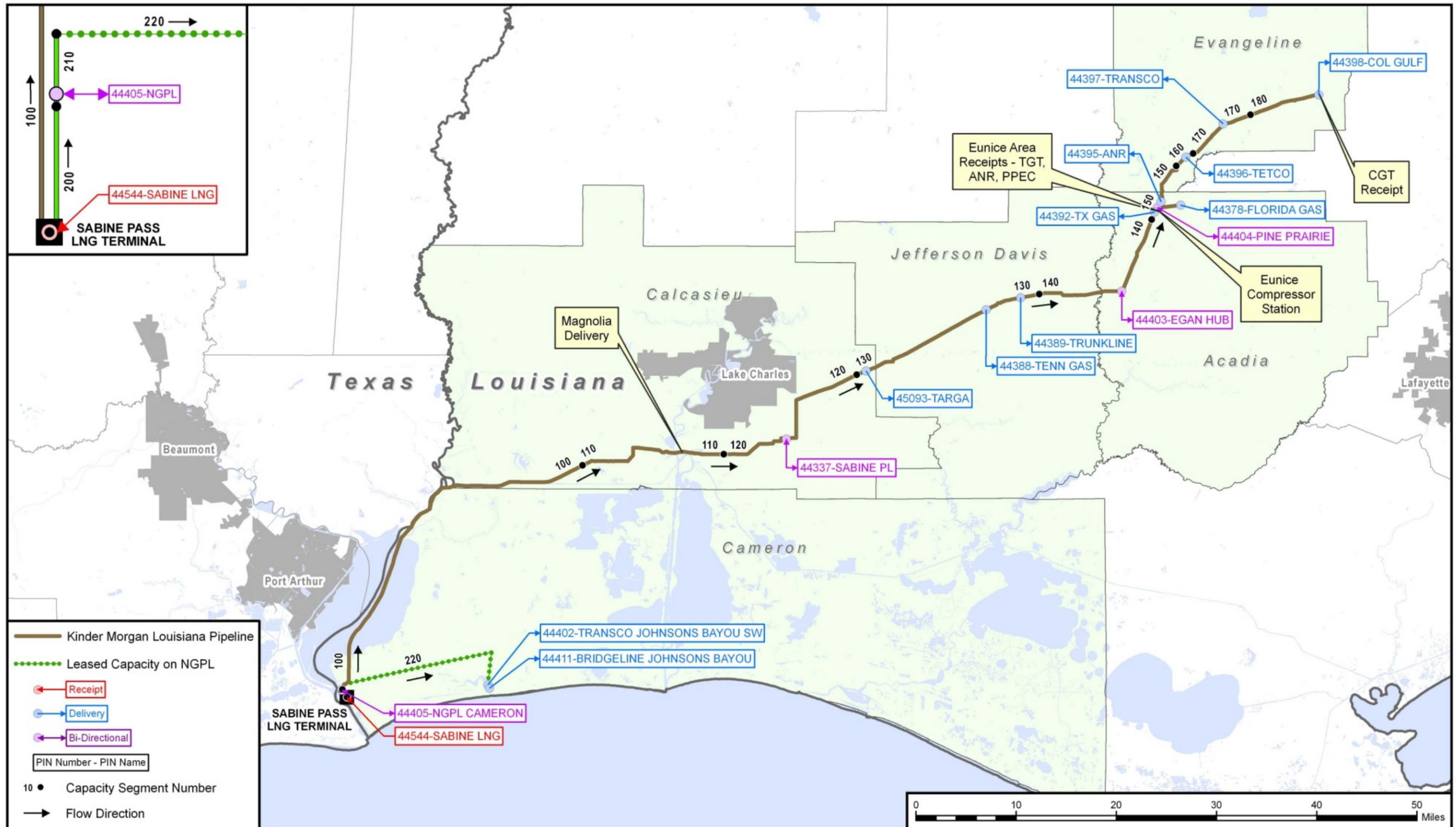


Figure 1.13-1 Proposed Magnolia LNG Project Interconnect with Kinder Morgan Louisiana Pipeline

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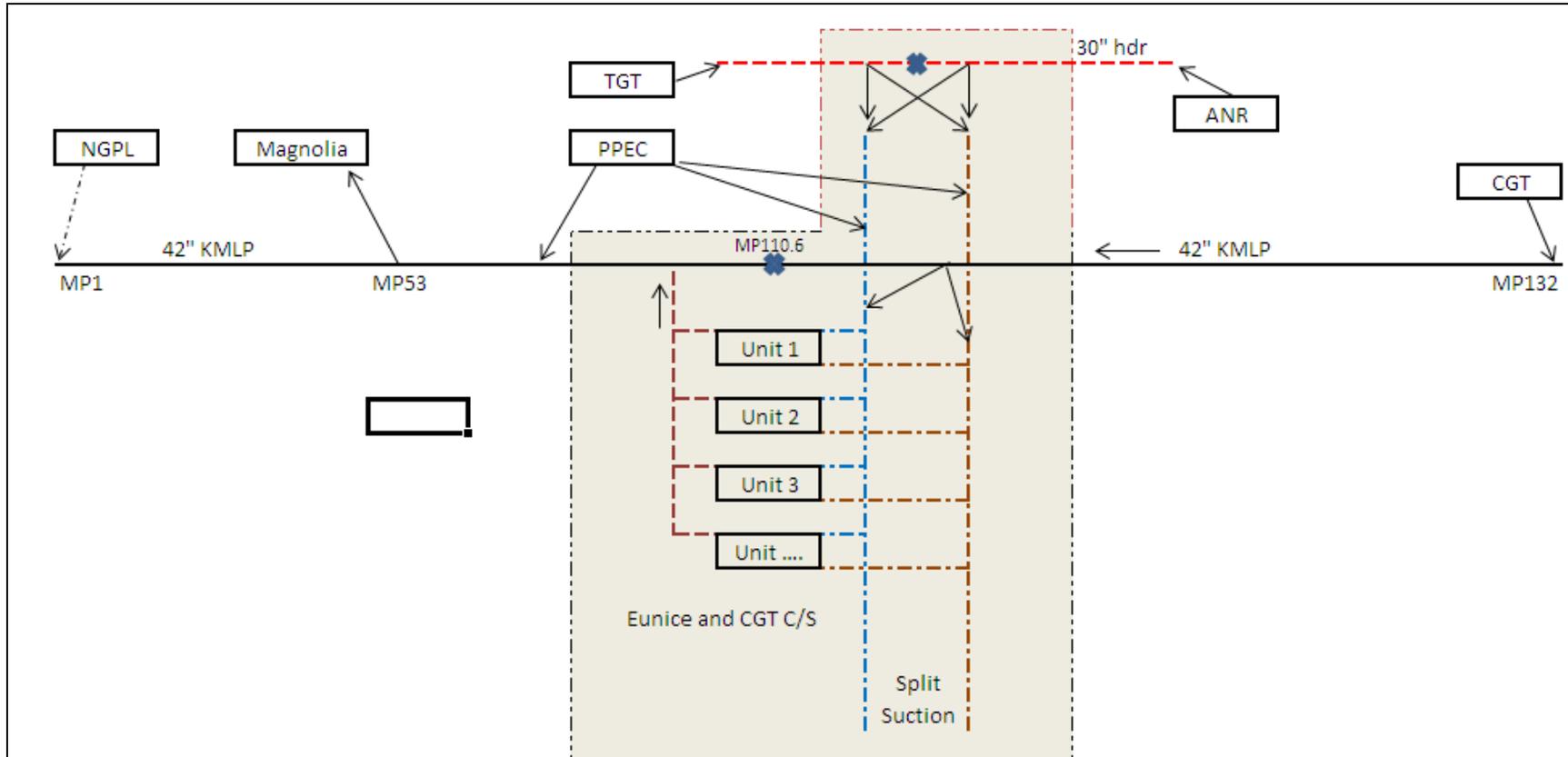


Figure 1.13-2 Schematic of Proposed Modifications to the Existing KMLP System at Eunice, Louisiana

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APPENDICES

- 1.A: USGS 7.5-Minute Series Topographic Maps
- 1.B: Aerial Photograph of Project
- 1.C: Real Estate Lease Option Agreements
 - 1.C.1 Port District Option Agreement
 - 1.C.2 BG LNG Option Agreement
 - 1.C.3 Amendment to the Port District Option Agreement
- 1.D: Project Schedule
- 1.E: Permits and Approvals for the Project
- 1.F: List of Landowners for the Project *[PRIVILEGED]*
- 1.G: Federal, State, Local, and Business Stakeholders

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Appendix 1.A
USGS 7.5-Minute Series Topographic Map

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Appendix 1.B
Aerial Photograph of the Project

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Appendix 1.C
Real Estate Lease Option Agreements

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Appendix 1.C

Real Estate Lease Option Agreements

On March 6, 2013, Magnolia signed an exclusive and binding four-year Real Estate Lease Option Agreement with the Lake Charles Harbor & Terminal District (the Port District) for approximately 107.59 acres of the approximately 115-acre Project site (Port District Option Agreement; see Appendix 1.C.1). The Port District Option Agreement includes a clause for a 30-year-term ground lease option with the right to extend the lease term for four periods of 10 years each, or 70 years in total. Subject to compliance with the terms of the Port District Option Agreement, Magnolia may exercise the option and enter into the ground lease with the Port District at any time.

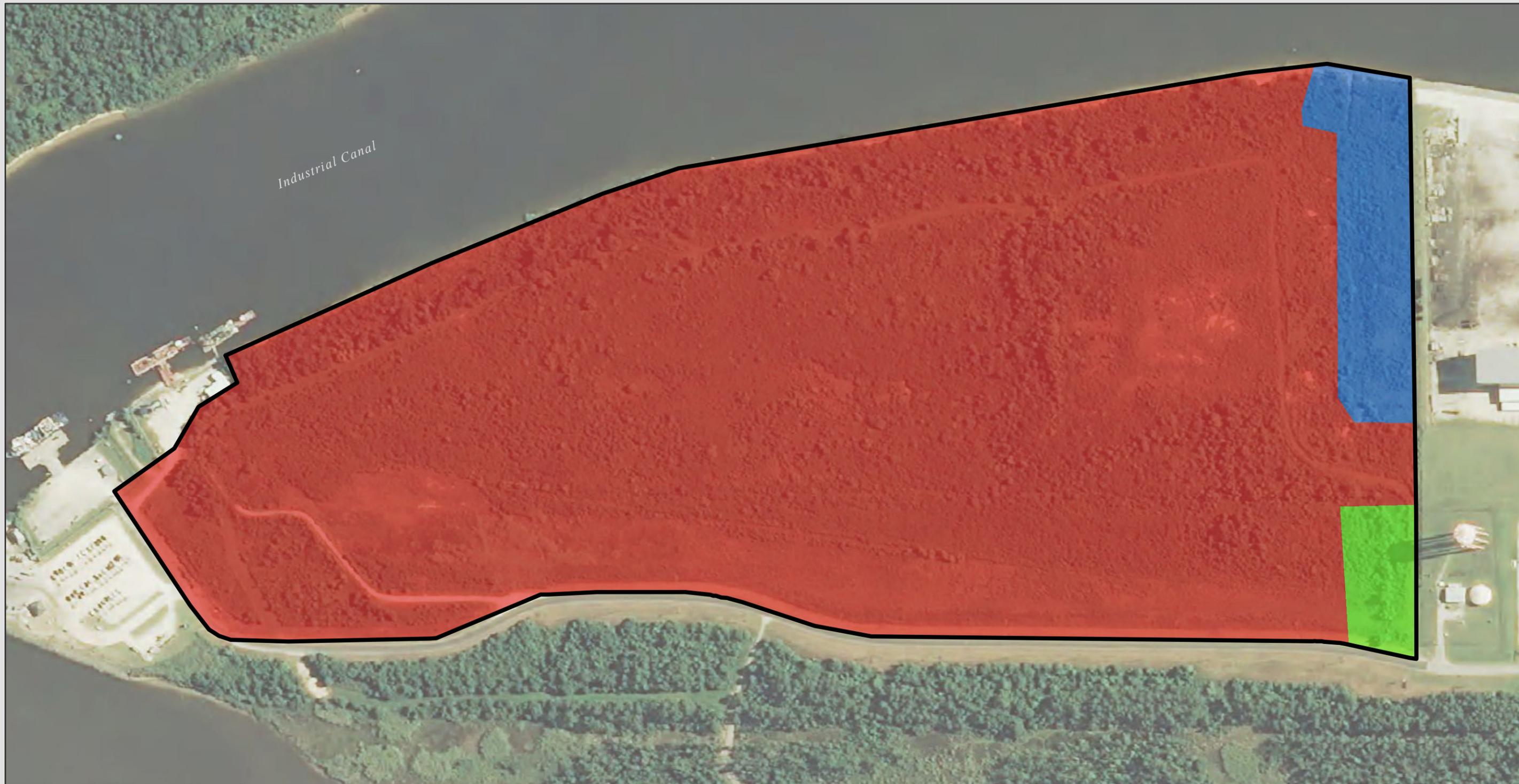
On September 26, 2013, Magnolia signed an exclusive and binding four-year Real Estate Lease Option Agreement with BG LNG Services, LLC (BG LNG) for approximately 5.74 acres of the approximately 115-acre Project site (BG LNG Option Agreement; see Appendix 1.C.2). The BG LNG Option Agreement includes a clause for a sublease option for an initial term expiring on December 31, 2022, with the right to extend the lease term for six periods of 10 years each. Subject to compliance with the terms of the BG LNG Option Agreement, Magnolia may exercise the option to enter into the sublease with BG LNG at any time.

On October 21, 2013, Magnolia signed the First Amendment to the Real Estate Lease Option Agreement with the Port District (First Amendment to the Port District Option Agreement; see Appendix 1.C.3). The First Amendment to the Port District Option Agreement deletes Exhibit 1 of the Port District Option Agreement, which provides the legal definition of the Project site, and substitutes a new Exhibit 1, which restates the initial definition of the Project site included in the Port District Option Agreement and adds an additional area of approximately 1.99 acres. The remaining provisions of the Port District Option Agreement remain in full force and effect and are unamended by the First Amendment to the Port District Option Agreement. Accordingly, the provisions of the Port District Option Agreement now cover approximately 109.58 acres of the approximately 115-acre Project Site.

Through the combination of the Port District Option Agreement, the First Amendment to the Port District Option Agreement, and the BG LNG Option Agreement, Magnolia will have control of the entire area comprising the approximately 115-acre Project site for at least the minimum expected operational life of the Project, which is 30 years.

Figure 1.C-1 shows the boundary of the lease areas described in these agreements, which is the entire Project site.

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**Figure 1.C-1
Port Lease Plan**

Magnolia LNG
Calcasieu Parish, Louisiana

Legend

 Magnolia LNG Project site boundary

 Real Estate Lease Option Agreement with Lake Charles Harbor & Terminal District – Signed March 6, 2013 (approximately 107.59 acres)

 Real Estate Lease Option Agreement with BG LNG Services, LLC – Signed On September 26, 2013 (approximately 5.74 acres)

 Amendment to Real Estate Lease Option Agreement with Lake Charles Harbor & Terminal District – Signed October 21, 2013 (approximately 1.99 acres)



**MAGNOLIA
LNG**

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Source- MSI 2013, NAIP 2013
Image Date- 08/27/2013
Date: 4/7/2014

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Appendix 1.C.1

Port District Option Agreement

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REAL ESTATE LEASE OPTION AGREEMENT

BE IT KNOWN, that on the dates hereinafter set forth, before the undersigned Notaries Public, duly commissioned and qualified in and for their respective State and County/Parish, and in the presence of the undersigned competent witnesses personally came and appeared:

MAGNOLIA LNG, LLC ("PROJECT COMPANY"), a Delaware limited liability company with its principal business office located at 5 Ord Street, West Perth, Western Australia 6005, and with its registered office in Louisiana at 5615 Corporate Blvd, Suite 400B, Baton Rouge, LA 70808, herein represented by its duly authorized undersigned representative; and

LAKE CHARLES HARBOR & TERMINAL DISTRICT ("DISTRICT"), a political subdivision of the State of Louisiana, herein represented by its duly authorized Executive Director, with its principal business office located in Calcasieu Parish, Louisiana at 751 Bayou Pines East, Suite P, Lake Charles, Louisiana 70601;

which hereinafter collectively declare that:

WITNESSETH:

WHEREAS, the DISTRICT is a deep-water port and political subdivision of the State of Louisiana (the "State") exercising governmental powers of the State as delegated and authorized pursuant to the Louisiana Constitution and other statutory supplemental authorities thereof, acting by and through the Executive Director of the DISTRICT, having its office and domicile at 751 Bayou Pines East, Suite P, Lake Charles, Louisiana;

WHEREAS, the PROJECT COMPANY has determined that DISTRICT-owned land along the south side of the Industrial Canal is needed for and essential to the construction, operation and maintenance of a liquefied natural gas processing and export facility ("the Facility"); such lands (the "Project Site") being described on Exhibit 1 attached hereto; and

WHEREAS, in an effort to realize its objective of promoting the economic development and creation of jobs in the greater Lake Charles area, the DISTRICT has decided to enter into this Real Estate Lease Option Agreement (this “Option Agreement”) to give PROJECT COMPANY the opportunity to assess the Project Site for purposes of locating, constructing, operating and maintaining the Facility, and any other facilities related to the operations of the PROJECT COMPANY as described above (collectively, the “Project”).

NOW, THEREFORE, in consideration of the above recitals and the mutual covenants hereinafter contained, the parties herein covenant and agree as follows:

AGREEMENT

1. **PARTIES.** This Option Agreement is between the DISTRICT and PROJECT COMPANY on the terms and conditions hereinafter set forth, to-wit:

2. **IRREVOCABLE AND EXCLUSIVE OPTION TO LEASE.**

A. **Initial Option Period.** For and in consideration of an option payment in the amount of One Hundred Thousand and NO/100 (\$100,000.00) Dollars (the “Initial Option Payment”) and the mutual covenants hereinafter contained, the DISTRICT does hereby grant unto PROJECT COMPANY, or its assignee, an irrevocable and exclusive option (the “Option”) to lease the Project Site, on the terms and conditions set forth in the attached and annexed Ground Lease marked as Annex A (the “Ground Lease”). This Option is hereby granted to PROJECT COMPANY for a period of twelve (12) months from the Effective Date (as defined in Paragraph 21) (the “Initial Option Period”). The Initial Option Payment shall be payable to the DISTRICT not later than fifteen (15) calendar days after the Effective Date of this Option Agreement.

B. **First Extended Option Period.** The Initial Option Period shall be subject to an extension for up to twelve (12) months (the “First Extended Option Period”) for any reason that the PROJECT COMPANY deems necessary in its sole discretion. The right to extend the Initial Option Period for the First Extended Option Period may be exercised by PROJECT COMPANY in its sole discretion in accordance with Paragraph 5 below. If PROJECT COMPANY exercises its right to extend the Initial Option Period, then PROJECT COMPANY will make a payment to

DISTRICT in the amount of One Hundred Twenty-Five Thousand and NO/100 (\$125,000.00) Dollars for the First Extended Option Period (the “First Additional Option Payment”) not later than fifteen (15) calendar days after exercising such right in accordance with Paragraph 5 below.

C. Second Extended Option Period. The First Extended Option Period shall be subject to an extension for up to twelve (12) months (the “Second Extended Option Period”), for any reason that the PROJECT COMPANY deems necessary in its sole discretion. The right to extend the First Extended Option Period for the Second Extended Option Period may be exercised by PROJECT COMPANY in its sole discretion in accordance with Paragraph 5 below. If PROJECT COMPANY exercises its right to extend the First Extended Option Period, then PROJECT COMPANY will make a payment to DISTRICT in the amount of Two Hundred Thousand and NO/100 (\$200,000.00) Dollars for the Second Extended Option Period (the “Second Additional Option Payment”), not later than fifteen (15) calendar days after exercising such right in accordance with Paragraph 5 below.

D. Third Extended Option Period. The Second Extended Option Period shall be subject to an extension for up to twelve (12) months (the “Third Extended Option Period”), for any reason that the PROJECT COMPANY deems necessary in its sole discretion. The right to extend the Second Extended Option Period for the Third Extended Option Period may be exercised by PROJECT COMPANY in its sole discretion in accordance with Paragraph 5 below. If PROJECT COMPANY exercises its right to extend the Second Extended Option Period, then PROJECT COMPANY will make a payment to DISTRICT in the amount of Three Hundred Thousand and NO/100 (\$300,000.00) Dollars for the Third Extended Option Period (the “Third Additional Option Payment”), not later than fifteen (15) calendar days after exercising such right in accordance with Paragraph 5 below. However, if Project Company properly exercises this Option to Lease the Project Site, then, in that event, the DISTRICT shall grant a credit to PROJECT COMPANY of \$100,000.00 toward any rent due under the Ground lease.

E. Option Exercise. In order to exercise its Option to lease the Project Site, PROJECT COMPANY shall give written notice to the DISTRICT of its intention to lease the Project Site in accordance with the provisions of Paragraph 5. If PROJECT COMPANY fails to timely exercise its Option during the Initial Option Period, the First Extended Option Period, the

Second Extended Option Period, or Third Extended Option Period, as applicable, no further payments shall be due by PROJECT COMPANY and this Option Agreement shall be terminated and be of no further force or effect. If PROJECT COMPANY, after meeting all required conditions, timely exercises its Option, during the Initial Option Period or, if applicable, during the First Extended Option Period, the Second Extended Option Period or Third Extended Option Period, the parties shall execute and deliver the Ground Lease on or before the Closing Date (as defined in Paragraph 8.D herein). Except as provided for in Paragraph, 2.D, any Option Payments made by PROJECT COMPANY under the Option Agreement shall not be deemed or considered rent, rental, or any other consideration under the Ground Lease or used as a credit against any rent or other consideration due under the Ground Lease.

F. Cancellation of Option by Project Company. Notwithstanding anything to the contrary in this Option Agreement, the PROJECT COMPANY shall have the right at any time during the Initial Option Period or, if applicable, during the First Extended Option Period, the Second Extended Option Period or Third Extended Option Period, to cancel the Option at any time without any additional liability to the DISTRICT upon delivery of written notice to the DISTRICT of PROJECT COMPANY's desire to cancel the Option. Upon such cancellation of the Option by PROJECT COMPANY at any time, the Initial Option Payment and, if applicable, the First Additional Option Payment, the Second Additional Option Payment and the Third Additional Option Payment (collectively, the "Option Payments"), shall be non-refundable to PROJECT COMPANY, but no other payments shall be due by PROJECT COMPANY and this Option Agreement shall be terminated and be of no further force and effect.

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4. RENT CREDIT. Project Company shall not be entitled to any credit for the Option Payments against rent due under the Ground Lease, except as set forth in Paragraph 2D.

5. EXERCISE OF OPTION/EXTENDED OPTION PERIOD. The Option to lease the Project Site, or the right to extend the Initial Option Period, the First Extended Option Period or the Second Extended Option Period as set forth above, must be exercised in each case, if at all, by delivery of a written notice from PROJECT COMPANY to the DISTRICT in substantially

the form of Exhibit 2 with the appropriate blanks completed on or before the expiration of the Initial Option Period or the First Extended Option Period, Second Extended Option Period or Third Extended Option Period, as applicable. Failure to timely exercise the Option or the right to extend the Initial Option Period, First Extended Option Period or Second Extended Option Period shall automatically terminate the right of PROJECT COMPANY to exercise the Option or to extend the Initial Option Period or First Extended Option Period, as applicable.

6. CONSIDERATION FOR THE LEASE OF PROJECT SITE. If PROJECT COMPANY meets all required conditions and timely exercises its Option to lease the Project Site, the DISTRICT shall comply with all terms and conditions of this Option Agreement as hereinafter set forth to lease the Project Site to PROJECT COMPANY on the Closing Date for the consideration as stated in the Ground Lease and in accordance with the provisions of this Option Agreement and the Ground Lease.

7. PROJECT COMPANY'S RIGHTS AND DISTRICT'S OBLIGATIONS DURING THE OPTION PERIOD.

A. Access and Inspection; Early Works. At all times during this Option Agreement, PROJECT COMPANY shall, at its cost, have reasonable access to the Project Site for the purpose of determining the suitability of the Project Site and performing any and all other inspections, analyses, tests and other due diligence that PROJECT COMPANY deems necessary or desirable in its sole discretion, including, without limitation, (i) developing preliminary engineering, design and construction information relative to the facilities required to comprise and support the Project, (ii) performing site assessments of the Project Site by a contractor or contractors, including, without limitation, Phase I and Phase II environmental site assessments and any other environmental assessments that PROJECT COMPANY or any governmental entity regulating the Project deems necessary, (iii) performing engineering design, geotechnical, geophysical, seismic, archaeological and land surveys and assessments of and around the Project Site, (iv) performing tests and inspections of improvements, structures, wells, septic tanks, underground storage tanks, soils, geologic hazards, utility lines and systems located on or under, the Project Site, (v) conducting soil borings upon the Project Site, for purposes of analyzing such soils, (vi) interviewing persons familiar with the Project Site, (vii) coordinating design activities

with the DISTRICT; (viii) performing a land survey and title review, and (ix) any other actions or activities deemed by PROJECT COMPANY in its sole discretion to be necessary or desirable for PROJECT COMPANY to inspect, assess and establish the suitability of the Project Site or assess compliance with this Option Agreement (collectively, the “Project Site Activities”). Further, PROJECT COMPANY may have additional rights to undertake certain activities on the Project Site subject and in accordance with an “Early Works Agreement” which may be negotiated and agreed upon in the future between PROJECT COMPANY and the DISTRICT. The PROJECT COMPANY and its employees, agents, representatives, contractors and consultants shall have access to the Project Site, during the Initial Option Period and the First Extended Option Period, the Second Extended Option Period or Third Extended Option Period, as applicable, unless and until the date on which PROJECT COMPANY shall have entered into the Ground Lease, or the expiration or termination of this Option Agreement. After the full execution of the Ground Lease, PROJECT COMPANY shall have access to the Project Site pursuant to the terms of the Ground Lease.

B. Compliance with Laws; No Environmental Liability. PROJECT COMPANY shall take reasonable measures to ensure that its employees, agents, representatives, contractors and consultants, in conducting any Project Site Activities, comply with all applicable laws, rules, regulations, ordinances and decrees of any governmental body. The DISTRICT acknowledges and agrees that PROJECT COMPANY shall not incur any liability for any hazardous materials and/or substances, including, but not limited to, natural occurring radioactive material (“NORM”), asbestos, and polychlorinated biphenyls (“PCB”), existing on the Project Site, as of the Lease Commencement Date (as defined in the Ground Lease) and shall not incur any liability for discovery of such hazardous materials and/or substances.

C. Delivery of Copies of Reports by Project Company. Excluding any materials owned by third parties, proprietary information of the PROJECT COMPANY, materials subject to obligations of confidentiality or other restrictions or materials that cannot easily be separated from materials pertaining to property other than the Project Site, all reports, plans, maps, surveys, soil studies, soil reports, or such other similar information pertaining solely to the physical condition of the Project Site developed by PROJECT COMPANY or its employees, agents, representatives, contractors and/or consultants pursuant to the Project Site Activities prior

to the Closing Date or, if the Option is not exercised, prior to the expiration of this Option Agreement (“Data”) shall be provided to DISTRICT at no cost within thirty (30) calendar days following the Closing Date or, if the Option is not exercised, within thirty (30) calendar days following the expiration of the this Option Agreement. DISTRICT acknowledges and agrees that PROJECT COMPANY owns all such Data, subject to DISTRICT’s right to utilize such Data for any purpose without further consents or approval of PROJECT COMPANY.

D. Delivery of Diligence Materials by District. No later than thirty (30) calendar days after the Effective Date, the DISTRICT shall provide to PROJECT COMPANY, at the DISTRICT’s expense: (i) copies of any and all title insurance policies, title abstracts, title commitments, title exception documents and vesting deeds for the Project Site; (ii) copies of any surveys, environmental assessments, audits, test results or reports, wetland mitigation documentation, engineering studies or surveys and soil conditions reports or studies, within the DISTRICT’s possession or access or that of its attorneys, consultants, contractors and/or engineers; (iii) copies of any and all Governmental Approvals (as defined in Paragraph 7.E herein) that apply to or that the DISTRICT has obtained for the Project Site; (iv) copies of all contracts, leases, agreements, security agreements, servitudes, liens and obligations currently in effect relating to the Project Site; (v) copies of any documents relating to pending litigation, written threats of litigation, legal violations, zoning changes or development moratoriums, and (vi) copies of any other information the DISTRICT may have in its possession or control regarding the Project Site (collectively, “Project Site Materials”). The parties acknowledge and agree that the DISTRICT’s obligation to provide the Project Site Materials is on-going during this Option Agreement, to the extent that any such information becomes available to or is created by or for the DISTRICT following the Effective Date.

E. Governmental Approvals. The DISTRICT shall assist and support PROJECT COMPANY in its efforts to complete and obtain (i) all regulatory permits and approvals (including, without limitation, the issuance of any FERC permits, special use permits, building permits, zoning matters, environmental permits, and any other permits, approvals or ordinances deemed necessary or desirable by PROJECT COMPANY in its sole discretion in order to construct, develop and operate the Project on the Project Site (“Governmental Approvals”), and (ii) satisfactory results from the Project Site Activities. PROJECT COMPANY agrees to

diligently pursue obtaining all Governmental Approvals and satisfying all requirements in connection therewith. The DISTRICT agrees that PROJECT COMPANY shall have the authority to apply for all Governmental Approvals and to cooperate with PROJECT COMPANY in obtaining and satisfying the requirements of any necessary Governmental Approvals. No Governmental Approvals shall be binding on the DISTRICT or create any obligations to be fulfilled by the DISTRICT unless the DISTRICT specifically consents to be bound by such obligations.

F. Operation of Project Site During Option Period. After the Effective Date, DISTRICT and its employees, contractors and agents (i) shall maintain the Project Site in the same condition as it was on the Effective Date, reasonable wear and tear excepted, and otherwise operate and maintain the Project Site in the same manner as before the Effective Date, (ii) except in the case of an emergency, or to avert a potential emergency, shall not take any action and shall not permit any third party to take any action that would unduly interfere with the PROJECT COMPANY'S lawful Project Site Activities, (iii) shall not take any action and shall not cause any third party to take any action that would materially alter or affect the condition of the Project Site, including, but not limited to, by causing a casualty or introducing, releasing, storing or exacerbating any hazardous waste or hazardous substances, including, but not limited to, NORM, asbestos, and PCBs, upon, around or under any portion of the Project Site or into the ground water beneath or adjacent to the Project Site or the Calcasieu River Ship Channel, and (iv) shall comply with any notices of legal violations or court orders affecting the Project Site. If DISTRICT becomes aware prior to the Closing Date of any introduction, release, storage or exacerbation of any hazardous waste or hazardous substances, including, but not limited to, NORM, asbestos, and PCBs, upon, around or under any portion of the Project Site or into the ground water beneath or adjacent to the Project Site or the Calcasieu River Ship Channel, then DISTRICT shall notify PROJECT COMPANY in writing the earlier of (a) within fifteen (15) calendar days after DISTRICT becomes aware of the same or (b) prior to the Closing Date. If the DISTRICT violates this Paragraph 7.F, then the DISTRICT shall take all reasonable actions to cure or remedy such violation at its sole cost and expense. If the DISTRICT is unable to cure or remedy such violation by the Closing Date, then PROJECT COMPANY shall have the option in its sole discretion (to be exercised in a written notice delivered to the DISTRICT) to: (a) grant the DISTRICT additional time within which to cure the violation, and in such event the Closing

(as defined in Paragraph 8.D herein) shall be extended for such time necessary to cure the violation (in which case PROJECT COMPANY and the DISTRICT shall continue to have all of the rights and obligations set forth in this Option Agreement until the Closing); (b) elect not to enter into the Ground Lease, whereupon the DISTRICT shall immediately refund the aggregate Option Payments paid to the DISTRICT and the DISTRICT shall be liable to PROJECT COMPANY for PROJECT COMPANY's actual third party costs and expenses incurred in the due diligence and/or development of the Project Site, drafting and negotiating of this Option Agreement and the Ground Lease, and preparation of the Closing of the transaction contemplated by this Option Agreement (including, without limitation, all costs and expenses incurred in connection with the Project Site Activities); or (c) waive such violation and proceed to Closing as provided in Paragraph 8.D below.

G. Termination of Prior Letter Agreement. As of the Effective Date, the letter agreement entitled "Authorization for Field Study and Survey- PLC Tract- 475s, Lake Charles, LA" dated September 17, 2012, as amended, by and between the DISTRICT and Liquefied Natural Gas Limited, shall terminate.

8. **ADDITIONAL RIGHTS AND OBLIGATIONS PENDING EXERCISE OF LEASE OPTION.** During the Initial Option Period, First Extended Option Period, Second Extended Option Period and Third Extended Option Period, as applicable, the DISTRICT and PROJECT COMPANY hereby agree as follows:

A. Verification of Title and Survey.

(i) PROJECT COMPANY, at PROJECT COMPANY's expense, may obtain a title insurance commitment ("Title Commitment") to be issued by a title insurance company acceptable to PROJECT COMPANY in its sole discretion ("Title Company"), pursuant to which the Title Company shall commit to issue a 2006 ALTA extended coverage leasehold title insurance policy to PROJECT COMPANY ("Leasehold Title Policy") and a 2006 ALTA leasehold title loan insurance policy to any lender(s) of PROJECT COMPANY ("Lender Title Policy", and collectively with the Leasehold Title Policy, the "Title Policies"), each in forms and insurable amounts reasonably acceptable to PROJECT COMPANY and with such endorsements as PROJECT COMPANY may reasonably request. The Title Commitment shall show the

DISTRICT to be vested with good, marketable and complete ownership interest of the Project Site, subject only to the following matters (the “Permitted Exceptions”): ad valorem real estate taxes, if any are owed, for the current year and subsequent years, not yet due and payable; all applicable zoning ordinances and regulations; and such other matters as shall be satisfactory to PROJECT COMPANY, in PROJECT COMPANY’s sole discretion.

(ii) PROJECT COMPANY may obtain, at PROJECT COMPANY’s expense, a current staked ALTA/ACSM survey of the Project Site, complying with the most current Minimum Standard Detail Requirements for ALTA/ACSM Surveys and including any Table A items that PROJECT COMPANY may request in its sole discretion (“Survey”), prepared by a surveyor or engineer licensed in Louisiana with a certificate attached thereto executed by the surveyor in the form of the most current Minimum Standard Detail Requirements certificate for ALTA/ACSM surveys. The Survey shall reflect the boundaries of the Project Site and all improvements, servitudes, highways, pipeline, utility and other rights-of-way, flood zone classifications and other matters affecting or abutting the Project Site, and shall be in a form sufficient to induce the Title Company to delete all standard and printed exceptions contained in the Title Commitment.

(iii) PROJECT COMPANY shall have until sixty (60) calendar days prior to Closing (the “Title Review Period”) to notify the DISTRICT of any title defects, encumbrances, servitudes, use restrictions or other matters noted in the Title Commitment, the Survey, or elsewhere that PROJECT COMPANY requires to be removed or corrected prior to the execution and issuance of the Ground Lease (“Title Objections”).

(iv) The Title Commitment will show that all standard exceptions will be deleted from the Leasehold Title Policy (and from the Lender Title Policy, if PROJECT COMPANY has requested one), when issued, and that the “gap” will be deleted as of the Closing Date. If, within the Title Review Period, PROJECT COMPANY notifies the DISTRICT of any Title Objections, the DISTRICT shall use its diligent, good faith, best efforts to cure and eliminate the Title Objections (unless caused directly or indirectly by the PROJECT COMPANY) at the DISTRICT’s expense. The PROJECT COMPANY shall have the right to make additional requirements or objections as to title, up until the Closing Date, in the event any

title or survey update or endorsement to the Title Commitment discloses matters not shown in the Title Commitment or Survey (“Additional Title Objections” and together with the initial Title Objections, the “Title Objections”). As long as this Option Agreement remains in effect, the DISTRICT shall not convey all or any interest in the Project Site to any third party (an “Unauthorized Transfer”) and, without PROJECT COMPANY’s prior written consent in its sole discretion, the DISTRICT shall not grant or amend any lease, license, permit to use, servitude, lien, security interest or other encumbrance on the Project Site (an “Unauthorized Encumbrance”). If the DISTRICT is unable to cure the Title Objections, Unauthorized Transfer or Unauthorized Encumbrance by the Closing Date, PROJECT COMPANY shall have the option in its sole discretion (to be exercised in a written notice delivered to the DISTRICT) to: (a) grant the DISTRICT additional time within which to cure the Title Objections, Unauthorized Transfer or Unauthorized Encumbrance, and in such event the Closing shall be extended for such time necessary to cure the Title Objections, Unauthorized Transfer or Unauthorized Encumbrance (in which case PROJECT COMPANY and the DISTRICT shall continue to have all of the rights and obligations set forth in this Option Agreement until the Closing); (b) elect not to enter into the Ground Lease, whereupon the DISTRICT shall immediately refund the aggregate Option Payments paid to the DISTRICT and the parties will be relieved from further liability hereunder, unless the DISTRICT defaulted in its obligations under this Option Agreement (including, but not limited to, causing and failing to cure an Unauthorized Transfer or Unauthorized Encumbrance) or acted in a commercially unreasonable manner in not curing such Title Objections, in which event the DISTRICT shall be liable to PROJECT COMPANY for PROJECT COMPANY’s actual third party costs and expenses incurred in the due diligence and/or development of the Project Site; drafting and negotiating of this Option Agreement and preparation of the Closing of the transaction contemplated by this Option Agreement (including, without limitation, all costs and expenses incurred in connection with the Project Site Activities); or (c) waive one or more of the Title Objections, Unauthorized Transfers or Unauthorized Encumbrances (at which point such Title Objections, Unauthorized Transfer or Unauthorized Encumbrances will become Permitted Exceptions) and proceed to the Closing, as provided in Paragraph 8.D below.

(v) For purposes of clarification, if the Survey reflects encroachments, non-contiguity, overlaps, strips, gaps, rights-of-way or other encumbrances or interests on or in the

Project Site, or any other survey matters, or if the Project Site, consists of two or more parcels which are not contiguous along the entire length of their common boundary, such defects may also be raised as a Title Objection as described in Paragraph 8.A (iv) above.

B. District's Representations. The DISTRICT warrants, covenants and represents, during the term of this Option Agreement, the following to PROJECT COMPANY with full knowledge that PROJECT COMPANY is relying upon same in agreeing to enter into this Option Agreement:

(i) The DISTRICT owns the Project Site. The DISTRICT has the full power and authority to make, deliver, enter into and perform pursuant to the terms and conditions of this Option Agreement and to consummate the transactions described in this Option Agreement and the Ground Lease, and has taken all necessary action and proceedings to authorize the execution, delivery and performance of the terms and conditions of this Option Agreement and the Ground Lease. No further consent of any person or entity is required in connection with the execution and delivery of, or performance by the DISTRICT of its obligations under this Option Agreement and the Ground Lease.

(ii) This Option Agreement and the documents to be executed and delivered by the DISTRICT in connection with the consummation of this Option Agreement are (and when the Option is exercised and the Closing has occurred, the Ground Lease will be) valid, binding and enforceable in accordance with their respective terms and conditions.

(iii) The execution, delivery and performance by the DISTRICT of this Option Agreement and the Ground Lease are not precluded by, and will not violate, any provisions of any existing law, statute, rule or regulation in Louisiana or any judgment, order, decree, writ or injunction of any court, governmental department, commission, board, bureau or agency, and will not result in a breach of, or default under, any agreement, mortgage, contract, undertaking or other instrument or document to which the DISTRICT is a party or by which the DISTRICT is bound or to which the DISTRICT or any portion of the Project Site is subject.

(iv) No portion of the Project Site is presently being or, as of the Effective Date, previously has been acquired by any governmental authority in the exercise of its power to

condemn or to acquire through eminent domain or private purchase in lieu thereof nor are any of these proceedings or actions threatened, pending or imminent.

(v) There are no actions, suits or proceedings pending or to the DISTRICT's Knowledge (as defined in Paragraph 8.B(xii)), threatened against, by or affecting the DISTRICT in any court or before any government agency regarding the Project Site, including, but not limited to, any such actions, suits or proceedings relating to the ownership of, or the DISTRICT's ability to lease the Project Site or that would affect the value or use or development of the Project Site or the obligations of the DISTRICT to enter into and perform its obligations under this Option Agreement or the Ground Lease .

(vi) All work, labor, service and materials furnished prior to the Closing Date to or in connection with the Project Site and any improvements constructed on the Project Site prior to the Closing Date, will be discharged by the DISTRICT prior to the Closing Date, so that no mechanics', materialmen's or other lien, except those created by PROJECT COMPANY, its affiliates or contractors, may be filed against the Project Site or such improvements. The DISTRICT shall indemnify, defend and hold PROJECT COMPANY harmless from and against any liens affecting the Project Site that were not created by the PROJECT COMPANY and (a) relate to work, labor, services, or materials furnished prior to the Closing Date and (b) are not filed or perfected until after the Closing Date.

(vii) To the DISTRICT's Knowledge there are no parties other than the DISTRICT in possession of any portion of the Project Site, as lessees, tenants at sufferance, licensees, or trespassers, and no person or entity has any right or option to lease, purchase, occupy or possess all or any part of the Project Site.

(viii) The DISTRICT has not entered into any agreement, commitments or arrangements concerning the Project Site, or development thereof with any persons, including, but not limited to, governmental entities or agencies, councils, boards or other entities, adjoining landowners, utility companies or agencies other than PROJECT COMPANY.

(ix) The Project Site is not subject to assessment or collection of additional taxes for prior years based upon a change of land usage or ownership.

(x) To the DISTRICT's Knowledge, the DISTRICT has not manufactured, stored, released or located any hazardous waste or hazardous substances, including, but not limited to, NORM, asbestos, and PCBs, upon, around or under any portion of the Project Site or into any ground water beneath or adjacent to the Project Site or into the Calcasieu River Ship Channel, and the DISTRICT has received no warning notice, violation notice, complaint (judicial or administrative) or any other formal or informal notice alleging that the Project Site is not in compliance with any statute, ordinance, rule or regulation pertaining to hazardous waste or substances, including, but not limited to, NORM, asbestos, and PCBs. Except as disclosed by any reports provided to PROJECT COMPANY pursuant to Paragraph 7.D of this Option Agreement, to the DISTRICT's Knowledge (a) no hazardous waste or hazardous substances, including, but not limited to, NORM, asbestos, or PCBs, have been manufactured, stored, released or located upon or under any portion of the Project Site or into any ground water beneath or adjacent to the Project Site or into the Calcasieu River Ship Channel, (b) the Project Site has never been used to treat, store, release or dispose of waste materials or hazardous substances, including, but not limited to, NORM, asbestos, or PCBs; (c) there has not been and is no leaching or drainage of waste materials or hazardous substances, including, but not limited to, NORM, asbestos, or PCBs, into the ground water beneath or adjacent to the Project Site or into the Calcasieu River Ship Channel; and (d) there have not been and are not buried or semi-buried or otherwise placed tanks, storage vessels, drums or containers of any kind located on the Project Site.

(xi) The DISTRICT has received no notice from any governmental authority concerning the imposition or widening of any streets, roads or highways abutting the Project Site or widening of the shipping channel alongside the Project Site, or concerning the imposition of any special taxes or assessments against the Project Site. The DISTRICT has no knowledge of general plan, specific plan, zoning or other land use regulation proceedings or special assessment proceedings pending or threatened, with respect to the Project Site. The DISTRICT is not a party to any covenant or agreement to preserve or prevent a change in the existing zoning, land use designations, special use permits or entitlements of the Project Site.

(xii) Other than as set forth in this Option Agreement, the DISTRICT has not (a) entered into any agreement relating to the Project Site, nor (b) encumbered or granted any interest in the Project Site.

Each of the foregoing warranties, covenants and representations shall still be true and correct as of the Effective Date (except where specifically noted) and the Closing Date, shall survive the Closing Date and shall not be merged with or into the Ground Lease or any other related instrument of conveyance or transfer. The term “Knowledge” as used in this Paragraph 8.B shall mean what the DISTRICT knows or should reasonably know about the Project Site, and any other matters addressed by the warranties, covenants, and representations made herein.

C. Project Company’s Representations. The PROJECT COMPANY warrants, covenants and represents, during the term of this Option Agreement, the following to the DISTRICT, with full knowledge that the DISTRICT is relying upon same in agreeing to enter into this Option Agreement:

(i) The PROJECT COMPANY has the full power and authority to make, deliver, enter into and perform its obligations pursuant to the terms and conditions of this Option Agreement and has taken all necessary action and proceedings to authorize the execution, delivery and performance of the terms and conditions of this Option Agreement. No further consent of any person or entity is required in connection with the execution and delivery of, or performance by the PROJECT COMPANY of its obligations under this Option Agreement.

(ii) The execution, delivery and performance by the PROJECT COMPANY of this Option Agreement are not precluded by, and will not violate, any provisions of any existing law, statute, rule or regulation in Louisiana or any judgment, order, decree, writ or injunction of any court, governmental department, commission, board, bureau or agency, and will not result in a breach of, or default under, any agreement, mortgage, contract, undertaking or other instrument or document to which the PROJECT COMPANY is a party or by which the PROJECT COMPANY is bound or to which the PROJECT COMPANY is subject.

(iii) There are no actions, suits or proceedings pending or to the PROJECT COMPANY’s Knowledge (as defined in Paragraph 8.C(iv)), threatened against, by or affecting

the PROJECT COMPANY in any court or before any government agency regarding the Project Site, including, but not limited to, any such actions, suits or proceedings relating to the ownership of, or the PROJECT COMPANY's ability to lease the Project Site or that would materially affect the contemplated use or development of the Project Site or the obligations of the PROJECT COMPANY to perform its obligations under this Option Agreement.

(iv) All work, labor, service and materials furnished to the PROJECT COMPANY prior to the Closing Date to or in connection with the Project Site, will be discharged by the PROJECT COMPANY prior to the Closing Date, so that no mechanics', materialmen's or other lien, created by the PROJECT COMPANY, its affiliates or contractors, may be filed against the Project Site or such improvements. The PROJECT COMPANY shall indemnify, defend and hold DISTRICT harmless from and against any liens affecting the Project Site that were not created by the DISTRICT and (a) relate to work, labor, services, or materials furnished prior to the Closing Date at the request or direction of the PROJECT COMPANY and (b) are not filed or perfected until after the Closing Date.

Each of the foregoing warranties, covenants and representations shall still be true and correct as of the Effective Date (except where specifically noted) and the Closing Date, shall survive the Closing Date and shall not be merged with or into the Ground Lease or any other related instrument of conveyance or transfer. The term "Knowledge" as used in this Paragraph 8.C shall mean what the PROJECT COMPANY knows or should reasonably know about the matters addressed by the warranties, covenants and representations made herein.

D. Closing. The execution of the Ground Lease (the "Closing") shall take place as soon as practical following the PROJECT COMPANY's exercise of the Option as provided in Paragraph 5 above, but in no event shall the Closing take place later than fifteen (15) calendar days following such exercise, as may be extended by the extensions provided for in Paragraphs 7.F, 8.A and 8.G ("Closing Date"). Possession of the Project Site shall be delivered to PROJECT COMPANY or its assignee as of the Closing Date, free and clear of the rights and claims of any other party other than Permitted Exceptions; provided, however, that prior to the Closing Date, PROJECT COMPANY and its employees, agents, representatives, contractors and

consultants shall have the right to enter upon the Project Site at any and all times for purposes of any further inspections of the Project Site as provided in Paragraph 7 above.

E. Expenses of Closing. At Closing, the DISTRICT shall pay the costs of recording any documents or certificates or taking any other action required to be taken to correct title defects or remove any title encumbrances (including, without limitation, any Title Objections, Additional Title Objections, Unauthorized Transfers or Unauthorized Encumbrances). At Closing, PROJECT COMPANY shall pay the costs of recording an extract or memorandum of the Ground Lease (as provided in the Ground Lease) and for the Leasehold Title Policy (and the Lender Title Policy, if PROJECT COMPANY has requested one) issued pursuant to the Title Commitment. PROJECT COMPANY and the DISTRICT shall each pay the fees and expenses of their respective counsel incurred in connection with the negotiation, preparation and execution of this Option Agreement and the Ground Lease, and satisfying its respective obligations under this Option Agreement. PROJECT COMPANY and the DISTRICT shall each pay any brokerage, finder's fee or similar commission in connection with the option or lease of the Project Site arising from its actions. PROJECT COMPANY shall pay the cost of the Survey and the Leasehold Title Policy (and the Lender Title Policy, if PROJECT COMPANY has requested one).

F. Closing Documents.

(i) The DISTRICT shall deliver the following at Closing:

(a) Fully executed and signed Ground Lease in substantially the form attached hereto as Annex A.

(b) Gap, mechanic's lien and possession affidavit(s) in forms sufficient to cause the Title Company to issue the Leasehold Title Policy (and the Lender Title Policy, if PROJECT COMPANY has requested one), without the applicable standard title policy exceptions.

(c) Resolution by the Board of Commissioners of the DISTRICT, authorizing the execution of the Ground Lease and the transactions and documents contemplated

by this Option Agreement and the Ground Lease in the form required by applicable laws and regulations and the DISTRICT's by-laws.

(d) Possession of the Project Site.

(ii) At Closing, PROJECT COMPANY shall:

(a) Deliver a certified copy of a resolution of the members or managers of PROJECT COMPANY (as required by the operating agreement of PROJECT COMPANY), authorizing the execution of the Ground Lease, and all other documents necessary to effect the valid execution of the Ground Lease.

(b) Cause the execution and delivery of the Ground Lease by a duly authorized officer of PROJECT COMPANY.

G. Conditions Precedent for Project Company to Close. The following are conditions precedent to PROJECT COMPANY's obligations at Closing, including execution of the Ground Lease:

(i) As of the Closing Date, all of the DISTRICT's representations and warranties contained in Paragraph 8.B hereof shall be true and correct.

(ii) The DISTRICT shall have performed all of its obligations under this Option Agreement.

(iii) The DISTRICT's interest in the Project Site shall be (and the DISTRICT hereby warrants and represents to PROJECT COMPANY that the same is) good, merchantable, marketable and free and clear of any liens, encumbrances, highways, rights-of-way, servitudes, licenses, restrictions, leases, agreements, covenants, conditions and limitations, except the Permitted Exceptions. The DISTRICT's title shall also be total and complete and not subject to any outstanding or contingent liens or claims of an undivided interest therein and PROJECT COMPANY shall have received the Survey and an irrevocable written commitment of the Title Company to issue the Leasehold Title Policy (and the Lender Title Policy, if PROJECT COMPANY has requested one), each in form and substance acceptable to PROJECT COMPANY.

(iv) There are no pending, threatened or existing moratoriums or governmental regulations, statutes, proceedings or actions pending, threatened or existing against the DISTRICT, the Project or the Project Site before any court or governmental agency or authority that would prohibit or inhibit PROJECT COMPANY from obtaining utility service, building permits or development approvals, or which would prevent, prohibit, delay or inhibit the construction, development and operation of the Project on the Project Site.

(v) Subsequent final geotechnical investigation does not necessitate any substantial revision to the type of structural design contemplated by the preliminary investigation conducted by or on behalf of PROJECT COMPANY.

(vi) PROJECT COMPANY shall have obtained Final Approval (as hereinafter defined) with respect to all Governmental Approvals, free of any unreasonable or extraordinary conditions imposed by the issuing entity upon the issuance of such Final Approvals (provided that PROJECT COMPANY has used its commercially reasonable efforts to pursue in good faith the necessary Final Approvals). “Final Approval” shall be the date when: (a) all of the Governmental Approvals have been approved and issued, in forms and with conditions satisfactory to PROJECT COMPANY; (b) the time has passed for appeal of all Governmental Approvals; and (c) any appeals or litigation with respect to clause (b) above have been prosecuted and fully and finally resolved in a manner satisfactory to PROJECT COMPANY. If the PROJECT COMPANY exercises the Option but fails to execute the Ground Lease through no fault of the DISTRICT, in addition to forfeiting the aggregate Option Payments paid, the PROJECT COMPANY shall be liable to the DISTRICT for the DISTRICT’s actual third party costs and expenses incurred in preparation of the Closing as contemplated by this Option Agreement.

(vii) There shall have been no material change in the condition of the Project Site from the condition in which the Project Site existed as of the date that PROJECT COMPANY exercised the Option without PROJECT COMPANY’s prior written consent.

(viii) DISTRICT shall not be in default of any other existing agreement with the PROJECT COMPANY (“Existing Agreements”), after notice and beyond any applicable cure period.

In the event that after PROJECT COMPANY's exercise of the Option, any of the conditions precedent to PROJECT COMPANY's obligation to lease the Project Site are not satisfied as of the Closing Date or not waived by PROJECT COMPANY or it is reasonably determined prior to the Closing Date that such conditions cannot be fulfilled or satisfied and the same are not waived by PROJECT COMPANY, then, at the sole option of PROJECT COMPANY (to be exercised in PROJECT COMPANY's sole discretion by delivery of written notice to DISTRICT): (i) PROJECT COMPANY may elect not to enter into the Ground Lease and this Option Agreement shall be terminated and all parties shall be relieved of any further obligations hereunder; whereupon the DISTRICT shall not be obligated to refund any of the Option Payments, except to the extent that the failure to fulfill or satisfy a condition results from DISTRICT's default under this Option Agreement with respect to its obligations described herein, in which case the DISTRICT shall be obligated to return the aggregate Option Payments paid by the PROJECT COMPANY and shall be liable for PROJECT COMPANY's actual third party costs and expenses incurred in the due diligence and/or development of the Project Site, drafting and negotiating of this Option Agreement and the Ground Lease, and preparation of the Closing of the transaction contemplated by this Option Agreement (including, without limitation, all costs and expenses incurred in connection with the Project Site Activities), or (ii) PROJECT COMPANY may, at its option and at no cost to the PROJECT COMPANY, extend up to three hundred sixty-five (365) days the Closing or for such period as is reasonably necessary to satisfy all of the conditions precedent to PROJECT COMPANY's obligation to proceed with the Closing.

H. Conditions Precedent for the District to Close. The following are conditions precedent to the DISTRICT's obligations at Closing, including execution of the Ground Lease:

(i) As of the Closing Date, all of the PROJECT COMPANY's representations and warranties contained in Paragraph 8.C hereof shall be true and correct in all material respects.

(ii) PROJECT COMPANY shall not be in default of any other Existing Agreement with the DISTRICT, after notice and beyond any applicable cure period.

(iii) PROJECT COMPANY shall have performed all of its obligations under this Option Agreement.

In the event that after PROJECT COMPANY's exercise of the Option, any of the conditions to DISTRICT's obligation to lease the Project Site are not satisfied as of the Closing Date or not waived by the DISTRICT, and the non-fulfillment or satisfaction of such conditions was not caused by the DISTRICT, in whole or in part, or it is reasonably determined prior to the Closing Date that such conditions cannot be fulfilled or satisfied and the same are not waived by the DISTRICT, then, at the sole option of the DISTRICT (to be exercised in the DISTRICT's sole discretion by delivery of written notice to PROJECT COMPANY): (i) the DISTRICT may elect not to enter into the Ground Lease and this Option Agreement shall be terminated and all parties shall be relieved of any further obligations hereunder; whereupon the DISTRICT shall not be obligated to refund any of the Option Payments. To the extent that the failure of such condition results from PROJECT COMPANY's default under this Option Agreement with respect to its obligations described herein, or any material obligation under any Existing Agreement with respect to its obligations described therein, the PROJECT COMPANY shall be liable for the DISTRICT's actual third party costs and expenses in drafting and negotiating of this Option Agreement and the Ground Lease, and preparation of the Closing of the transaction contemplated by this Option Agreement, or (ii) the DISTRICT may, with the PROJECT COMPANY'S written consent, extend up to three hundred sixty-five (365) days the Closing or for such period as is reasonably necessary to satisfy all of the conditions precedent to the DISTRICT's obligation to proceed with Closing, in exchange for which PROJECT COMPANY shall pay the DISTRICT One Hundred Fifty Thousand and NO/100 (\$150,000.00) Dollars, prorated for the period of such extension.

I. Mutual Indemnification. The PROJECT COMPANY agrees to indemnify, defend and hold the DISTRICT and the DISTRICT's officers and directors harmless from and against any and all claims, actions, damages, liabilities and expenses (including, without limitation, reasonable attorneys' fees and expenses) resulting from any occurrence on the Project Site during the term of this Option Agreement and arising from any act or omission of PROJECT COMPANY or the PROJECT COMPANY's employees, agents, representatives, contractors or consultants, except to the extent that any of the same arise from or out of the negligence or

willful misconduct of the DISTRICT or the DISTRICT's employees, agents, representatives, contractors or consultants. The DISTRICT agrees to indemnify, defend and hold the PROJECT COMPANY and the PROJECT COMPANY's officers, directors, managers, and members harmless from and against any and all claims, actions, damages, liabilities and expenses (including, without limitation, reasonable attorneys' fees and expenses) resulting from any occurrence on the Project Site during the term of this Option Agreement and arising from any act or omission of the DISTRICT or the DISTRICT's employees, agents, representatives, contractors or consultants, except to the extent that any of the same arise from or out of the negligence or willful misconduct of the PROJECT COMPANY or the PROJECT COMPANY's employees, agents, representatives, contractors or consultants.

9. Intentionally left blank.

10. SUCCESSORS AND ASSIGNS. This Option Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective successors and lawful assigns. However, this Option Agreement may not be assigned or transferred by PROJECT COMPANY to any other person or entity without the consent of the DISTRICT, which consent shall not be unreasonably withheld, delayed or conditioned; provided that if PROJECT COMPANY is not in default after notice and beyond any applicable cure period under this Option Agreement or any material obligation under an Existing Agreement, PROJECT COMPANY may assign this Option Agreement in its entirety without the DISTRICT's prior consent to (i) an Affiliate or (ii) a successor in interest in connection with a merger, acquisition or sale of all or substantially all of PROJECT COMPANY's assets or membership interests of PROJECT COMPANY, (iii) as collateral in connection with a financing, or (iv) any person to whom PROJECT COMPANY is permitted to assign the Option Agreement. "Affiliate" shall mean an entity that controls, is controlled by or is under common control with the PROJECT COMPANY, where "control" mean means the ownership directly or indirectly of more than fifty percent (50%) of the voting rights in a company or other legal entity or the ability to directly or indirectly appoint a majority of the directors in a company or other legal entity.

11. NOTICES. All notices required or allowed by this Option Agreement shall be delivered by email (with a requirement that such electronic notice shall be followed within three (3)

calendar days by written notice delivered in one of other manners permitted in this paragraph), third party overnight courier (including overnight courier services such as Federal Express) or by certified mail, return receipt requested, postage prepaid, addressed to the party to whom notice is to be given, at the following addresses:

If to PROJECT COMPANY: Magnolia LNG, LLC
616 Broad Street
P.O. Box 3759 (70602)
Lake Charles, LA 70601
Attention: Company Secretary
Email: dgardner@lnglimited.com.au

with a copy to: Winfield E. Little, Jr.
616 Broad Street
P.O. Box 3759 (70602)
Lake Charles, LA 70601
Email: wlittle@littlelawfirm.com

and

Chad Mills
Sutherland Asbill & Brennan LLP
1001 Fannin Street, Suite 3700
Houston, TX 77002-6760
Email: chad.mills@sutherland.com

If to the DISTRICT: Lake Charles Harbor & Terminal District
751 Bayou Pines East, Suite P
Lake Charles, LA 70601
Attention: Executive Director
Email: brase@portlc.com

With a copy to: General Counsel
Lake Charles Harbor & Terminal District
751 Bayou Pines East, Suite P
Lake Charles, LA 70601
Email: mdees@portlc.com

Notice shall be deemed to have been given upon receipt by recipient (provided that any notice by email shall have been followed within three (3) calendar days by written notice delivered in one of the other manners permitted under this paragraph), by the overnight courier airbill or by the

return receipt. In the event that the recipient fails or refuses to sign the return receipt for delivery by certified mail, the receipt shall be sufficient.

12. DEFAULT. In the event of a default by the DISTRICT with respect to any of its obligations hereunder, including the satisfaction of all conditions precedent or any breach or misrepresentation by the DISTRICT of any warranties, representations and covenants made by the DISTRICT in Paragraph 8.B, PROJECT COMPANY shall, except as otherwise provided for herein, be entitled to the right of specific performance against the DISTRICT together with the recovery of all expenses incurred in obtaining specific performance, including reasonable attorney's fees and all costs of court or, at PROJECT COMPANY's sole election, PROJECT COMPANY shall be entitled to terminate this Option Agreement and the DISTRICT shall immediately return all Option Payments previously paid by PROJECT COMPANY as liquidated damages and shall be liable for PROJECT COMPANY's actual third party costs and expenses incurred in the due diligence and/or development of the Project Site, drafting and negotiating of this Option Agreement and the Ground Lease, and preparation of the Closing of the transaction contemplated by this Agreement (including, without limitation, all costs and expenses incurred in connection with the Project Site Activities) and PROJECT COMPANY may exercise any other rights or remedies available at law or in equity. For the avoidance of doubt, this is in addition to any rights for the return of the Option Payments that the PROJECT COMPANY may have under this Option Agreement.

13. EMINENT DOMAIN/CASUALTY. If, during the term of this Option Agreement, there is any taking of any portion of the Project Site by eminent domain or condemnation, then the DISTRICT shall promptly deliver written notice thereto of the PROJECT COMPANY, and if the PROJECT COMPANY determines that such taking will materially affect the Project Site for the development, construction, maintenance or operation of the Project, in PROJECT COMPANY's reasonable determination, PROJECT COMPANY may, at its option (to be exercised in PROJECT COMPANY's sole discretion by delivery of written notice to the DISTRICT), terminate this Option Agreement or elect to not enter into the Ground Lease (if PROJECT COMPANY has already exercised the Option), whereupon the DISTRICT shall immediately refund the aggregate Option Payments paid to the DISTRICT and the parties will be relieved from further liability hereunder. In the event that the Project Site is rendered, at any

time during the term of this Option Agreement or prior to the Closing, in PROJECT COMPANY's sole determination, permanently unsuitable for the development, construction, maintenance or operation of the Project as a result of a casualty event (including any hurricane, named storm, flood or tornado) or Force Majeure (as hereinafter defined) event occurring in and around Calcasieu Parish, Louisiana, then PROJECT COMPANY may, at its option (to be exercised in PROJECT COMPANY's sole discretion by delivery of written notice to the DISTRICT), terminate this Option Agreement or elect to not enter into the Ground Lease (if PROJECT COMPANY has already exercised the Option), whereupon the DISTRICT shall immediately refund the aggregate Option Payments paid to the DISTRICT and the parties will be relieved from further liability hereunder.

14. ENTIRE AGREEMENT. This Option Agreement constitutes the entire agreement of the parties with respect to subject matter hereof. All understandings and agreements heretofore between the parties hereto with respect to the subject matter hereof are merged in this Option Agreement which alone fully and completely expresses their understanding.

15. ATTORNEY'S FEES. In connection with any litigation concerning this Option Agreement, the prevailing party shall be entitled to recover all of its costs, expenses and reasonable attorney's fees from the non-prevailing party.

16. NO WAIVER. No waiver of any provision of this Option Agreement shall be effective unless it is in writing and signed by the party against whom it is asserted; and any such written waiver shall only be applicable to the specific instance to which it relates and shall not be deemed to be a continuing or future waiver.

17. AMENDMENTS. This Option Agreement may not be amended, modified, altered or changed in any respect whatsoever except by further agreement in writing and duly executed by the parties hereto.

18. GOVERNING LAW. This Option Agreement shall be governed in its enforcement, construction and interpretation by the laws of the State of Louisiana. In the event that either party must file suit as a result of a default on the part of the other, such suit shall be filed in a state court of competent jurisdiction in the Fourteenth Judicial District Court, State of Louisiana,

unless the default of dispute implicates or involves a federal statute, regulation, order, or permit, in which case venue shall be in the federal courts for the Western District of Louisiana.

19. **COUNTERPARTS; HEADINGS; TIME OF THE ESSENCE.** This Option Agreement may be executed in counterparts by the parties hereto and each of which shall be deemed an original but all of which taken together shall constitute but one and the same instrument. The paragraph captions and headings contained in this Option Agreement are included herein for convenience of reference only and shall not be considered a part hereof and are not in any way intended to define, limit or enlarge the terms hereof. Time shall be of the essence for each and every provision of this Option Agreement of which time is an element.

20. **RECORDING.** This Option Agreement shall not be recorded in the public records, provided, however, that the DISTRICT shall execute, acknowledge and deliver to PROJECT COMPANY a memorandum of this Option Agreement in recordable form prepared by PROJECT COMPANY, which may be recorded by PROJECT COMPANY in the conveyance records of Calcasieu Parish, Louisiana.

21. **EFFECTIVE DATE.** The effective date of this Option Agreement (“Effective Date”) shall be the last date that the DISTRICT or PROJECT COMPANY executes this Option Agreement.

22. **REAL ESTATE COMMISSION.** The DISTRICT and PROJECT COMPANY each represent to the other party that they have dealt with no brokers in connection with the negotiation, execution and/or delivery of this Option Agreement or the Ground Lease, and no party is entitled to any broker’s commission, finder’s fee or similar payment with respect to this Option Agreement or the Ground Lease arising from the representing party’s actions. If any other person shall assert a claim to a finder’s fee, brokerage commission or other compensation on account of alleged employment as finder or broker in connection with this transaction, the party against whom the purported finder or broker is claiming shall indemnify, defend and hold the other party harmless from and against any such claim and any and all costs, expenses and liabilities incurred in connection with such claim or any action or proceeding brought thereon, including, but not limited to, reasonable attorney’s fees and court costs in defending such claim.

23. FORCE MAJEURE. Notwithstanding any other provision of this Option Agreement, provided that notice is given within thirty (30) calendar days of an occurrence of an event of Force Majeure (as hereinafter defined) by the party hereto seeking to invoke and utilize the provisions of this Paragraph 23, such party shall be excused from performing any of its respective obligations or undertakings required hereunder for so long as the performance of such obligations are prevented or significantly delayed, retarded or hindered by any event of Force Majeure, provide that an event of Force Majeure shall not excuse any party from making any payment of money required under this Option Agreement. As used in this Paragraph, “Force Majeure” means any cause not reasonably within the control of the party claiming suspension, and shall include, but not be limited to, the following: (i) physical events such as acts of God, landslides, lightning, earthquakes, fires, storms, hurricanes, droughts, floods, washouts, or explosions, (ii) weather related events affecting an entire geographic region; (iii) acts of others such as strikes, lockouts or other industrial disturbances, riots, sabotage, terrorism, insurrections, civil disturbance or wars; provided that the settlement of strikes, lockouts or other industrial disturbances shall be within the sole discretion of the party claiming such suspension; (iv) the failure or interruption of performance by PROJECT COMPANY’s engineering, procurement and construction contractors or any subcontractors of such contractor to the extent caused by an event of Force Majeure; or (v) the failure or interruption of performance by PROJECT COMPANY’s suppliers by reason of such supplier’s valid declaration of an event that would constitute an event of force majeure under PROJECT COMPANY’s contract with such supplier; or (vi) governmental actions such as necessity for compliance with any court order, law, statute, ordinance, regulation or policy having the effect of law promulgated by a governmental authority having jurisdiction, or that restrict PROJECT COMPANY’s ability to construct the Project or any delay in issuance or effectiveness of any Governmental Approval that has been properly applied for by PROJECT COMPANY that is required to construct the Project.

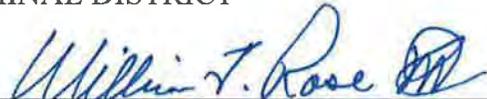
[Signatures on Following Pages]

THUS DONE AND SIGNED by the DISTRICT at Lake Charles, Louisiana, in the presence of the undersigned competent witnesses and me, Notary, on this 6th day of March, 2013.

WITNESSES:


Print Name: Walter M. Sanchez

LAKE CHARLES HARBOR &
TERMINAL DISTRICT

By: 
William J. Rase, III, Executive Director


Print Name: John LeBlanc

Approved By:


Michael K. Dees, General Counsel

BEFORE ME: 
Notary Public

My Commission expires: at my death

Winfield Eud Little Sr FT 08630

THUS DONE AND SIGNED by MAGNOLIA LNG, LLC at Lake Charles, Louisiana in the presence of the undersigned competent witnesses and me, Notary, on this 6th day of March, 2013.

WITNESSES:

MAGNOLIA LNG, LLC

Ginger E. Adam
Print Name: GINGER E. ADAM

By: [Signature]
Name: Fletcher Maurice Brand
Title: Managing Director

Judy McCleary
Print Name: Judy McCleary

BEFORE ME: [Signature]
Notary Public

My Commission expires: at 7 death
Winfield End little bit 08/30

ANNEX A

(Form of "Ground Lease")

ANNEX A

STATE OF LOUISIANA

PARISH OF CALCASIEU

GROUND LEASE

THIS GROUND LEASE (hereinafter "Lease") is made and entered into, and is effective, as of _____, 20__ ("Lease Commencement Date") by and between the LAKE CHARLES HARBOR AND TERMINAL DISTRICT, a political subdivision of the State of Louisiana (hereinafter "the District" or "LESSOR"), and MAGNOLIA LNG, LLC, a limited liability company organized and existing under the laws of the State of Delaware (hereinafter "LESSEE").

WHEREAS, LESSOR and LESSEE desire to enter into a lease agreement on certain terms and conditions as set forth in this Lease.

THEREFORE, LESSOR and LESSEE agree as follows:

* * * * *

KNOW ALL MEN BY THESE PRESENTS: That,

LESSOR for and in consideration of the annual rentals herein specified and other good and valuable consideration, the sufficiency of which is hereby acknowledged, does hereby rent, let, and lease unto LESSEE, all that certain tract or parcel of land containing ___ acres, more or less, being more particularly described as set forth on Exhibit A hereto (hereinafter "Leased Premises"). In connection with the permitted uses of the Leased Premises as provided for in Sections 3 and 4 below or as otherwise provided for herein and only if LESSOR is in full compliance with the terms and conditions provided for herein, LESSEE may also use the bottoms of the Industrial Canal adjacent or near the Leased Premises to the extent such use is allowed by applicable law and in accordance with all the rules and regulations of the State of Louisiana, the United States of America and the general rules and regulations of general applicability of LESSOR, including, but not limited to, Tariff No. 013 of the Lake Charles Harbor and Terminal District, as it may be amended from time to time.

1. Term.

(a) Term. The term of this Lease shall be the period commencing on the Lease Commencement Date and expiring thirty (30) years from the Lease Commencement Date (the "Expiration Date"), herein sometimes referred to as the "Initial Term", subject to four (4) options to extend the term of this Lease on the same terms and conditions ("Renewal Options") for additional periods of ten (10) years each ("Renewal Term" or "Renewal Terms").

(b) Exercise of Renewal Options. The Renewal Options shall be exercisable only by LESSEE, in its sole discretion, by delivery of written notice to LESSOR no later than six (6) months prior to the expiration of the Expiration Date or the then current Renewal Term, as applicable, provided that as of the giving of such notice LESSEE is not in default under this

Lease beyond applicable notice and cure periods. The failure of LESEE to exercise any Renewal Option for any Renewal Term in accordance with the terms of this section 1 (b) shall terminate such Renewal Options for such Renewal Terms, unless otherwise agreed in writing by LESSOR and LESSEE, and in such instance, the Lease will expire as of the Expiration Date or at the end of the then current Renewal Term, as applicable Contract Year. The term “Contract Year” under this Lease shall mean any full twelve (12) month period during either the Initial Term or any Renewal Term commencing, for the first such period, on the Lease Commencement Date and, thereafter, on each anniversary of the Lease Commencement Date.

2. **Rent.**

(a) Base Rent. The initial annual base rent for the Leased Premises (“Base Rent”) shall be \$306,000.00 per year, with this amount having been paid by LESSEE at or prior to the Lease Commencement Date with respect to the first Contract Year. The amount of Base Rent shall be fixed for the first three (3) Contract Years, and shall be paid annually in advance on or before each anniversary of the Lease Commencement Date during the first three (3) Contract Years. Thereafter, the Base Rent shall be adjusted and paid as set forth in Section 2(b) below.

(b) CPI Adjustment. Commencing with the fourth (4th) Contract Year and continuing during the remainder of the Initial Term and any applicable Renewal Term, the Base Rent shall be adjusted, effective as of the beginning of each Contract Year (each an “Adjustment Date”), by a percentage equal to the CPI Percentage Increase (as defined below), and shall be paid annually in advance for each such Contract Year within thirty (30) calendar days after each Adjustment Date (in order to permit LESSEE to calculate the CPI Percentage Increase, as set forth below). The term “Consumer Price Index” shall mean the unadjusted Consumer Price Index for All Urban Consumers (CPI-U), All Items, U.S. City Average 1982-84=100, calculated and published by the United States Department of Labor, Bureau of Labor Statistics. In the event the Consumer Price Index is discontinued, the parties shall accept comparable statistics on the purchasing power of the consumer dollar as published at the time of said discontinuation by a responsible periodical of recognized authority to be chosen by the parties. The term “CPI Percentage Increase” shall mean, with respect to any Contract Year for which a CPI Percentage Increase is being calculated, the percentage increase calculated by subtracting the average Consumer Price Index for the last month prior to the preceding Contract Year, from the average Consumer Price Index for the last month prior to the Contract Year for which a CPI Percentage Increase is being calculated, and dividing the positive difference, if any, by the average Consumer Price Index for the last month prior to the preceding Contract Year, and multiplying this quotient (rounded to the nearest ten thousandth) by 100. For illustrative purposes only, if the average Consumer Price Index for the last month prior to the Contract Year for which a CPI Percentage Increase is being calculated was 200.0, and the average Consumer Price Index for the last month prior to the preceding Contract Year was 175.0, then the CPI Percentage Increase would be 14.29% (i.e., $200.0 - 175.0 = 25.0 / 175.0 = 0.1429 \times 100 = 14.29\%$). No adjustment to Base Rent shall reduce the amount of Base Rent to an amount that is less than the Base Rent, as adjusted, due for the preceding Contract Year. The CPI Percentage Increase for any Contract Year shall be calculated by LESSEE, and LESSEE shall deliver written notice describing such calculation in reasonable detail (“CPI Notice”), together with adjusted annual Base Rent for such Contract Year, no later than thirty (30) calendar days after the commencement of the applicable Contract Year. If LESSOR disagrees with LESSEE’s calculation of the CPI Percentage Increase, then

LESSOR shall deliver to LESSEE written notice, describing the basis for such disagreement in reasonable detail ("CPI Disagreement Notice"), not later than thirty (30) calendar after delivery of the CPI Notice. If LESSOR fails to deliver a CPI Disagreement Notice within thirty (30) calendar after delivery of any CPI Notice, then LESSOR shall be conclusively deemed to have agreed with the calculation of the CPI Percentage Increase set forth in such CPI Notice. In the event of delivery of a CPI Disagreement Notice, upon resolution and agreement between the parties, the parties shall make an adjustment to the Base Rent previously paid with respect to such Contract Year.

(c) Additional Rent. LESSEE will pay the LESSOR, in addition to the Base Rent, as adjusted above, additional rent assessed on LNG throughput ("Additional Rent"), which shall be calculated on a per unit basis equal to 18/100th's cent (or \$0.0018) per dekatherm (the "Additional Rent Rate") for natural gas either (i) delivered from LESSEE's LNG regasification terminal into one or more natural gas pipelines ("Delivered Gas") or (ii) loaded from LESSEE's LNG liquefaction terminal into an LNG transport vessel for export (other than for temporary storage purposes or for purposes of providing vessel gasification and cool-down services) ("Delivered LNG"). In no instance will such Additional Rent be less than \$372,600.00 ("Minimum Additional Rent") (e.g.: Minimum Annual Rent on 567,000 dekatherms/day x \$0.0018 per dekatherm times 365 days = \$372,600.00) per Contract Year, regardless of actual throughput volume, but prorated for partial Contract Years. Payment of Additional Rent shall commence upon the earlier of the "Commercial Operations Date" of the Facilities as determined by Federal Energy Regulatory Commission ("FERC"), or December 1, 2017, and shall be paid by LESSEE to LESSOR each Contract Year in twelve equal monthly payments. Beginning on the fourth (4th) anniversary of the Lease Commencement Date, the Minimum Additional Rent will be increased each Contract Year on the anniversary of the Lease Commencement Date by a percentage equal to the CPI Percentage Increase as described in Section 2(b) above; provided, however, that no adjustment to Minimum Additional Rent shall reduce the amount of Minimum Additional Rent to an amount that is less than the Minimum Additional Rent due for the preceding Contract Year, and further provided that in no event shall Minimum Additional Rent exceed \$572,600. The Additional Rent Rate as of the Lease Commencement Date is \$0.0018. Any Additional Rent due over the Minimum Annual Rent will be paid annually, in arrears, based on the actual throughput volumes for the prior Contract Year, within thirty (30) calendar days after the end of such Contract Year. LESSEE acknowledges that vessels calling at the LESSEE's Facilities may also be subject to channel user fees, taxes and/or tariffs should the District impose such fees, taxes or tariffs at a future date in accordance with a general plan authorized by and in accordance with applicable law to be implemented by the District on all commercial vessels subject to the requirement of pilotage. LESSEE, however, shall not be responsible for such fees, taxes or tariffs or for arranging or requiring calling vessel owners or charterers to pay same; the District being solely responsible for dealing directly with such vessel owners and charterers regarding such channel user fees.

(d) Independent Covenants. The obligations to pay Base Rent and Additional Rent are covenants that are independent of all other covenants under this Lease, and no Force Majeure Event (as defined below) will relieve LESSEE of the obligation to pay Base Rent and Additional Rent. Further, the term "Rent" as sometimes used herein shall include Base Rent and Additional Rent.

3. Use of Leased Premises.

(a) Use of Leased Premises by LESSEE. The Leased Premises may be used by LESSEE, its successors and assigns, only for any purpose relating to the loading, unloading, handling, treatment, processing, producing, transporting, distributing, selling, metering and/or storing of (i) natural gas, natural gas liquids, and other natural gas products, derivatives and by-products and (ii) other petroleum and hydrocarbon liquids, gases, products, derivatives and by-products, including, but not limited to, (A) the importation, regasification, production, exportation, liquefaction, refinement, enhancement, other treatment and transportation (including by ship, pipeline, truck or rail) of liquefied natural gas (“LNG”), and LNG by-products and additives and (B) the excavation for, development, construction, installation, use, operation, maintenance, repair, expansion, optimization, alteration and/or removal of any improvements, fixtures, facilities, equipment and/or appurtenances (including natural gas pipelines, natural gas liquids extraction, processing and delivery facilities, acid gas removal units, natural gas liquefaction trains, LNG regasification facilities, and other treatment facilities, cryogenic pipelines, LNG storage tanks, petroleum and other hydrocarbon liquids storage facilities, nitrogen storage and processing facilities, power generation and transmission infrastructure, marine, rail and trucking receipt, delivery and servicing facilities (including jetties, terminals, docks and loading and unloading equipment), and other utilities and facilities (including control rooms, offices, warehouses and yards), in each case, necessary, ancillary or desirable in connection with the performance of the foregoing purposes (“Facilities”). LESSEE shall, at its sole cost and at all times, maintain in reasonably good condition the Facilities. LESSEE may, at its sole cost, excavate, develop, construct, install, use, operate, maintain, repair, expand, modify, alter, demolish, remove and reconstruct the Facilities at any time and from time to time as it deems necessary and appropriate for its purposes. Any improvements demolished and removed by LESSEE pursuant to the preceding sentence shall become the property of LESSEE and LESSEE may retain any amounts received for salvage or otherwise. LESSEE shall at all times comply with all laws, rules and regulations applicable to the Facilities or LESSEE’s activities on the Leased Premises. LESSEE acknowledges and agrees that it will not utilize its dock on the Leased Premises for lay berth or for vessel operations unrelated to the operation, construction, replacement or maintenance of the Facilities or Leased Premises without the consent of the LESSOR, which consent may be conditioned on a mutually satisfactory revenue sharing arrangement.

(b) Waiver of Surface Rights. To the extent LESSOR holds any rights to oil, gas, sulphur, or other minerals (“Minerals”) in the Leased Premises, LESSOR waives any right of LESSOR or its lessees or assignees to use the surface of the Leased Premises to explore for, drill for, access, extract, mine, exploit or otherwise make use of such Minerals, during the term of this Lease, and LESSOR and/or its lessees or assigns shall exercise any rights to such Minerals via directional drilling or other means (“Surface Waiver”). If any third party holds any rights in Minerals, LESSOR shall obtain a Surface Waiver from such third party, for the benefit of LESSEE. Any directional drilling or other subsurface Mineral activities of LESSOR and/or its lessees or assignees or any other party shall take place at a depth of not less than the greater of 2500 feet or such other feet as may be determined or set by the FERC below the surface and shall not adversely affect the lateral or subjacent support of the Facilities or interfere with LESSEE’s operations or rights under this Lease in any way.

(c) Entry of LESSOR. LESSOR may request entry into the Leased Premises during normal business hours by delivery of a written request to LESSEE a reasonable time (but in any event not less than twenty-four (24) hours) prior to the requested entry, and LESSEE shall not unreasonably withhold its approval of such request, provided, however, that any entry into the Leased Premises by LESSOR and/or its employees or agents shall be subject to LESSEE's rules and security procedures and all applicable laws, permits and regulations.

(d) Condition of Leased Premises. LESSEE declares that LESSEE has thoroughly inspected the Leased Premises. LESSEE accepts the property, component parts, improvements and conditions of the Leased Premises in an "as is" and "where is" basis, in their condition as of the Lease Commencement Date, and assumes responsibility therefor to the fullest extent allowed by LSA-R.S. 9:3221. Without prejudice to Section 10, LESSEE expressly waives and releases LESSOR from all warranties pertaining to the condition of the Leased Premises, including, but not limited to, any warranty against visible, hidden, or latent defects, and LESSEE does also waive any right LESSEE may or might have relative thereto (i) to rescind or revoke this Lease on the basis of any such warranty, and (ii) except for any damage to the Leased Premises arising from the gross negligence or willful misconduct of LESSOR or its employees, contractors or agents after the Lease Commencement Date, to have LESSOR repair or replace all or any part of the Leased Premises and any component parts, improvements, equipment, fixtures and any other items that might be relative to the Leased Premises. Except for any damage to the Leased Premises arising from the gross negligence or willful misconduct of LESSOR or its employees, contractors or agents after the Lease Commencement Date, LESSOR shall not be required to make any improvements or repairs of any kind or character to the Leased Premises during the term of this Lease, and LESSEE shall assume all responsibility for improvements and repairs necessary or desirable in connection with LESSEE's use of the Leased Premises.

(e) Labor and Material Liens. LESSEE shall keep the Leased Premises free from liens arising from delinquent invoices for work or services performed on the Leased Premises or materials provided to the Leased Premises at LESSEE's request, provided that LESSEE shall have the right to dispute any such invoice so long as LESSEE posts a bond sufficient to remove or release any labor and material lien which may arise from such disputed invoice.

(f) Utility Charges. LESSOR shall not have any obligation to pay any utility charges made or incurred in connection with LESSEE's use of the Leased Premises, and LESSEE shall be solely responsible therefor.

4. Dredging; Easements; Channel Access.

(a) Dredging of the Slip and Ship Channel. LESSEE shall have the right to remove soil and spoil from, and to add fill to, the Leased Premises and to dredge the slip and dredge and widen the Calcasieu River Ship Channel or the Industrial Canal, and, without further payment to LESSOR, deposit the dredge spoils on areas owned by LESSOR designated as Areas 12A and 12B (as allowed by applicable law), in each case in connection with the excavation for, development, construction, installation, use, operation, maintenance, repair, expansion, optimization, alteration and/or removal of the Facilities, and for the purpose of constructing, creating, expanding, operating and maintaining a ship berthing and turning basin, provided, however, that LESSEE shall, at its own expense, obtain any required permits and/or approvals

from the United States Army Corps of Engineers, (the “Corps”) and/or any other governmental agencies, and LESSEE shall comply with such permits and approvals.

(b) *Easements.* To the extent required land or property interests are currently owned by the LESSOR, LESSOR will grant any reasonable required easements or rights of way that are necessary or useful in constructing, maintaining or operating the Facilities to the extent that such easements or rights of way do not unreasonably interfere with the use or future development of the land or property rights by LESSOR.

(c) *Channel Access and Usage.* LESSEE and the District agree and acknowledge that nothing in this Lease is intended to, or shall be construed as, granting vessels calling at LESSEE’s Facilities any greater or lesser priority with regard to channel access and usage than existing users of the channel, and vessels calling at LESSEE’s Facilities are subject to the same vessel traffic controls and management as the District may, in compliance with applicable laws, impose on other vessels using the Calcasieu River Ship Channel.

5. FERC Application; Wetland Mitigation.

(a) *FERC Application.* The District shall reasonably cooperate with LESSEE, at no cost to the District, with respect to any application or other submission by LESSEE to the FERC, Department of Energy or other governmental or regulatory agencies related to the proposed Facilities or LESSEE’s other permitted uses of the Leased Premises, including any expansion of such Facilities, and the District shall not oppose any such application or other such submission

(b) *Wetlands Mitigation.* LESSOR has provided LESSEE with that certain letter dated January 25, 1994 from the Corps, attached hereto as Exhibit B, stating that the Corps has determined that the Leased Premises are not subject to wetland mitigation or regulation. However, should such determination be found not to be valid and enforceable, the LESSOR will use its best efforts to assist LESSEE to minimize any required wetland permitting, regulation or mitigation, and reasonably cooperate to make other lands or property interests owned by the LESSOR available to LESSEE for the purpose of effecting any such required wetlands permitting.

6. Additional Charges Legally Assessable by the District. LESSEE hereby acknowledges that the Base Rent and the Additional Rent constitute all charges applicable for the use, enjoyment and operation of the Leased Premises, but are not intended to include, and will not include, reduce or abate, any charges legally assessable by the District against vessels calling at LESSEE’s Facilities or using any other facilities or waterways or otherwise subject to the District’s jurisdiction to assess fees and such fees and charges will be separately assessed, charged and paid by the vessel’s owners or charterers in accordance with the District’s assessments of same, all in accordance with applicable laws and regulations. Nothing in this Lease is intended to relieve obligations of LESSEE to pay taxes or tariffs legally assessable by the District that LESSEE is obligated to pay the District under applicable laws, provided that all such fees and charges are assessed and applied uniformly and apply to the use of the District’s waterways (and not land).

7. **Permits.** LESSOR authorizes LESSEE to secure, at the cost of LESSEE, any permits or authorizations required by any state, local, or federal agency, or other governing or regulating authority, for LESSEE's Facilities or operations, and LESSOR shall cooperate, as landowner, in securing any such permits or authorizations. LESSEE shall assume full responsibility for any obligations and liabilities imposed in securing such permits, contained in such permits, or imposed by law with respect to such permits, and shall hold LESSOR harmless from any liability, penalties, damages, expenses, and judgments, and shall defend any actions arising from the securing or issuance of such permits or the applications therefor; provided, however, that any such liability, penalties, damages, expenses or judgments arising solely as a result of the negligence or willful misconduct of the District shall be excluded from this indemnity.

8. **Ownership of Facilities; Surrender at End of Lease; Liability.** All Facilities constructed or placed upon, in, under, over, or through the Leased Premises by LESSEE, shall remain the property of LESSEE and may be removed by LESSEE at any time during the Initial Term or any Renewal Term, subject and subordinate to Section 17 and the rights of any Leasehold Lender under any Leasehold Mortgage. Subject and subordinate to Section 17 and the rights of any Leasehold Lender under any Leasehold Mortgage, upon the expiration or termination of this Lease, LESSOR may elect, in its sole discretion, by delivery to LESSEE of written notice thereof (a "Surrender Election Notice"), to require LESSEE to either surrender possession of the Facilities that are permanently attached to the ground upon the Leased Premises (collectively, "Permanent Facilities"), at no cost to LESSOR, in which case such Permanent Facilities shall be surrendered to LESSOR in their "as-is, where-is" condition, with all defects) or remove the Permanent Facilities (provided, however, that in no event shall LESSEE be required to remove any docks, berths, wharves, electrical interconnection infrastructure, roadways, rail lines, underground pipelines, fill materials, foundations, or other underground Facilities, all of which may be abandoned in place in accordance with applicable laws). With respect to any scheduled expiration of this Lease, LESSOR shall deliver the Surrender Election Notice to LESSEE not less than twenty-four (24) months prior to scheduled expiration of the Initial Term or Renewal Term, as applicable. With respect to any earlier termination of this Lease, LESSOR shall deliver the Surrender Election Notice to LESSEE as soon as reasonably practicable, but not more than ten (10) calendar days after the effective date of such termination (the "Early Termination Date"). If LESSOR elects to require removal of the Permanent Improvements, then LESSEE shall have an additional period of up to twenty-four (24) months after the scheduled expiration of this Lease or the Early Termination Date, as applicable (the "Removal Period"), to complete such removal in accordance with this paragraph, in which case the terms and conditions of this Lease shall continue to apply during such Removal Period, except that LESSEE shall not be obligated to pay Base Rent or Additional Rent during the Removal Period and LESSEE may not use the Leased Premises for any purpose other than removal of the Permanent Improvements. LESSEE shall continue to have the right to use Henry Pugh Boulevard for ingress, egress and access to, from and between the Leased Premises and Big Lake Road during the Removal Period. With respect to Facilities that are not Permanent Facilities, LESSEE shall remove such Facilities not later than one hundred eighty (180) calendar days after the scheduled expiration of this Lease or the Early Termination Date, as applicable. Subject and subordinate to Section 17 and the rights of any Leasehold Lender under any Leasehold Mortgage, any Facilities that are not removed by the time fixed for such removal in this paragraph shall be irrevocably deemed to be abandoned by LESSEE, and LESSOR may

elect, in its sole discretion, to remove such Facilities from the Leased Premises at LESSEE's sole cost (less any salvage value received by LESSOR) and may dispose of such Facilities without notice or liability to LESSEE, provided, however, that title to any such Facilities that LESSOR does not remove from the Leased Premises shall automatically pass to LESSOR. In no event shall LESSEE be required to restore the Leased Premises to their condition prior to construction of the Facilities or to restore any alterations of the Leased Premises, and LESSEE shall surrender the Leased Premises upon the expiration or earlier termination of this Lease (as the same may be extended by the Removal Period) in their "as-is, where-is" condition, with all defects (provided, however, that in no event LESSEE shall be excused from any default of LESSEE's obligations under this Lease). If the LESSEE holds over after the expiration or termination of this Lease, with or without the consent of the LESSOR, such tenancy shall be from month-to-month only. Such month-to-month tenancy, whether with or without the LESSOR's consent, shall be subject to every other term, covenant, and agreement contained herein, and shall not constitute a renewal or extension of the term of this Lease. LESSOR shall not be responsible for any loss or damage occurring to any Facilities owned, leased, or operated by the LESSEE, its agents, or employees, prior to or subsequent to the termination of this Lease, other than, to the extent required by law, for such loss or damage occurring as a result of the negligent conduct or the willful misconduct or gross negligence of the LESSOR, its officers, representatives, agents, contractors or employees or the LESSOR's misrepresentations or its breach of or default under this Lease.

9. **Casualty; Condemnation.**

(a) *Casualty.* This Lease shall not terminate or be cancelled at any time upon the damage or destruction by fire or other casualty of all, substantially all, or any part of the Leased Premises or the LESSEE's Facilities. LESSEE shall have full use of and the right to apply its insurance proceeds available for rebuilding and restoration of LESSEE's Facilities.

(b) *Condemnation or Expropriation.* If the whole of the Leased Premises shall be taken under power of eminent domain or expropriation by any public or private authority, then this Lease and the applicable term hereof shall cease and terminate as of the date of such taking. If only a portion of the Leased Premises shall be taken, and such partial taking shall result in the inability of LESSEE to operate its Facilities, or have a material adverse effect upon LESSEE's operation of its Facilities, on the remainder of the Leased Premises, then LESSEE may, at its election, terminate this Lease by giving LESSOR notice of the exercise of LESSEE's election within one hundred twenty (120) calendar days after LESSEE shall receive notice of such taking. In the event of termination under this Section 9(b), and any unearned Base Rent, Additional Rent or other charges, if any, paid in advance, shall be refunded to LESSEE, and this Lease shall cease and terminate as of the date of such taking, subject, however, to the right of LESSEE, at its election, (i) to continue to occupy the Leased Premises, subject to the terms and provisions of this Lease, for all or such part, as LESSEE may determine, of the period between the date of such taking and the date when possession of the Leased Premises shall be taken by the public authority; and (ii) to keep this Lease in full force and effect so as to obtain the highest possible award from the condemning authority, if termination of this Lease would reduce any award for a taking, as set forth herein below in this Section 9(b). In the event of a taking of a portion of the Leased Premises and this Lease is not terminated, then Base Rent shall be reduced pro rata based upon the portion of the Leased Premises taken. The parties reserve any rights each may have under applicable law to seek from the expropriating authority an award for a taking of their

respective interests in, under and to the Leased Premises and this Lease. All compensation awarded for any taking of the Leased Premises shall belong to the party to whom such award was made. If only one award is made as to the Leased Premises, such award shall be allocated between LESSOR and LESSEE in accordance with their respective interests. Notwithstanding the foregoing, any award attributable or applicable to any improvements on the Leased Premises shall belong to LESSEE. LESSOR agrees that, to the extent permitted by law, LESSOR waives and forebears the use of any of its power of expropriation that would impair LESSEE's interest in, under and to this Lease or the performance of this Lease.

10. **Warranty of Title.** This Lease is made without warranty of title or possession either expressed or implied, except as expressly set forth in this Lease. This Lease, as it applies to the Leased Premises, is subject to all matters of record in the Official Records as of the Lease Commencement Date with respect to the Leased Premises. LESSOR covenants and warrants that LESSOR is the sole owner of the Leased Premises (subject to matters of record in the Official Records), and LESSEE shall peacefully hold and enjoy all of the rights granted by this Lease for the entire term (including any Renewal Terms) without hindrance or interruption by LESSOR or any person lawfully or equitably claiming by, through or under or superior to LESSOR, subject to the terms and conditions of this Lease; and as long as LESSEE is not in material default of the terms and conditions of this Lease beyond applicable notice and cure periods.

11. **Taxes.**

(a) Taxes on Facilities. LESSEE agrees to pay any and all taxes assessed against LESSEE's Facilities, or assessed against the Leased Premises as a result of Facilities placed on the Leased Premises by LESSEE. LESSEE shall pay all taxes and license fees required for operations LESSEE conducts on the Leased Premises. LESSEE shall have the right to seek abatement of taxes for any portion of the term of this Lease, through one or more programs available in the State of Louisiana with respect to taxes assessed against LESSEE's Facilities and the equipment, trade fixtures and other tangible personal property proposed to be used by Tenant in connection with its use and occupancy of the Facilities. The District agrees to reasonably cooperate with LESSEE in seeking such abatement of taxes, at no cost or expense to the District.

(b) Taxes on Real Property. The District is exempt from the payment of ad valorem property taxes. The District will use its reasonable best efforts to maintain current law that the District is not required to pay taxes. However, if the law providing for such exemption of the District from taxes changes or otherwise taxes are owed by the District, then LESSEE shall pay all taxes assessed with respect to the ownership by the District of the Leased Premises during the term of this Lease so long as the District delivers to LESSEE a copy of the tax assessor's invoice for such taxes not less than thirty (30) calendar days prior to the due date shown in such invoice, in which case LESSEE shall pay the amount due no later than the due date shown in such invoice. The District shall pay (and LESSEE shall not be responsible or liable for) any fines or penalties assessed for non-payment or late payment of such taxes if the District does not deliver the tax assessor's invoice to LESSEE not less than thirty (30) calendar days prior to the due date shown in such invoice. Notwithstanding the foregoing, "taxes," as used herein, shall not include, and LESSEE shall not be required to pay, any franchise, transfer, income, capital gains or similar tax

of or on LESSOR unless such tax is imposed, levied or assessed in substitution for ad valorem property tax.

12. **Default by LESSEE or by LESSOR.**

(a) If LESSEE is in default under this Lease, or has failed to comply with any of its obligations hereunder within the time periods set forth herein, LESSOR shall give LESSEE specific written notice of the alleged breach in which event (i) LESSEE shall have ten (10) calendar days from said notice within which to cure any monetary default, and (ii) LESSEE shall have forty-five (45) calendar days from said notice within which to cure any other default, provided, however, after such notice, if LESSEE has commenced in good faith to cure such non-monetary default within said forty-five (45) calendar day period but cannot reasonably cure such non-monetary default without more time, then LESSEE shall have such additional time required to cure such default so long as LESSEE is diligently prosecuting such cure to completion.

(b) If LESSEE fails to cure any default within the time periods set forth in Section 12(a) above, then subject to Section 17 below, LESSOR shall have the right at LESSOR's option to do any one or more of the following: (i) terminate this Lease effective immediately or as of any date which LESSOR may select, or (ii) proceed one or more times for past due installments of Rent without prejudicing LESSOR's rights to proceed later for remaining installments or to exercise any other remedy, or (iii) require specific performance of LESSEE, or (iv) seek and recover damages from LESSEE, or (v) have recourse to any other remedy to which LESSOR may be entitled to by law. Notwithstanding Section 17 below, LESSOR shall also have the right to draw on any Letter of Credit provided by LESSEE in accordance with Section 18 below.

(c) If LESSOR is in default under this Lease, or has failed to comply with any of its obligations hereunder within the time periods set forth herein, LESSEE shall give LESSOR specific written notice of the alleged breach in which event (i) LESSOR shall have ten (10) calendar days from said notice within which to cure any monetary default, and (ii) LESSOR shall have forty-five (45) calendar days from said notice within which to cure any other default, provided, however, after such notice, if LESSOR has commenced in good faith to cure such non-monetary default within said forty-five (45) calendar day period but cannot reasonably cure such non-monetary default without more time, then LESSOR shall have such additional time required to cure such default so long as LESSOR is diligently prosecuting such cure to completion.

(d) If LESSOR fails to cure any default within the time periods set forth in Section 12(c) above, then LESSEE shall have the right to invoke any remedy allowed by law.

(e) Should it become necessary for LESSOR, because of breach of LESSEE, to place the enforcement of this Lease or any part hereof, or the collection of any Rent due or to become due hereunder, or recovery of the possession of the Leased Premises, in the hands of an attorney, or file suit upon the same, LESSEE also agrees to pay LESSOR's costs and charges pertaining thereto, including reasonable attorney's fees. Should it become necessary for LESSEE, because of breach of LESSOR, to place the enforcement of this Lease or any part hereof, in the hands of an attorney, or file suit upon the same, LESSOR also agrees to pay LESSEE's costs and charges pertaining thereto, including reasonable attorney's fees.

(f) In regard to any claim by LESSOR or LESSEE against the other, LESSOR and LESSEE agree to, reasonably and in good faith, take all available and appropriate steps to mitigate, to the maximum extent reasonable under the circumstances, any loss, damage or claim made by LESSOR or LESSEE against the other.

13. **Assignment.** This Lease and the rights granted hereby may only be assigned by LESSEE, its successors and assigns, in whole or in part, with the written consent of LESSOR, which consent shall not be unreasonably withheld, conditioned or delayed by LESSOR provided that LESSEE is not in default beyond applicable notice and cure periods under this Lease. LESSEE shall give LESSOR written notice of any proposed assignment hereof no less than thirty (30) calendar days prior to the proposed effective date of such assignment. Subject to Section 17, any assignee shall assume LESSEE's obligations and liabilities hereunder, including, but not limited to, the obligation to provide replacement credit support in accordance with Section 18. Notwithstanding the foregoing, LESSEE shall have the right, after thirty (30) calendar days prior written notice thereof to LESSOR but without the requirement of consent by LESSOR, to assign LESSEE's rights, title and interest in, to and under this Lease to (a) any Affiliate (as defined below) of LESSEE, (b) any transferee or grantee of all or substantially all of the assets of LESSEE or ownership interests (whether stock, shares or membership interests) in LESSEE, (c) any entity resulting from a merger, non-bankruptcy reorganization or consolidation with LESSEE, (d) to any entity owned by an Affiliate or Affiliates of one or more of the ultimate parent entities that own direct or indirect interests in LESSEE or (e) a Leasehold Mortgagee or any purchaser upon a foreclosure of a Leasehold Mortgage or transferee upon a transfer in lieu of foreclosure (*dation en paiement*) pursuant to a Leasehold Mortgage; provided, in each case, that such assignment shall not be a subterfuge by LESSEE to avoid its obligations under this Lease, and upon such assignment, LESSEE shall not be released from liability under this Lease without LESSOR's written consent. The term "Affiliate" shall mean (i) LESSEE's parent company or any wholly owned subsidiary of LESSEE's parent company, or (ii) any entity Controlling, under common Control or Controlled by LESSEE or LESSEE's parent company. The term "Control" shall mean (A) with respect to a corporation, the right to exercise, directly or indirectly, more than fifty percent (50%) of the voting rights attributable to the stock or shares of the controlled corporation, and (B) with respect to an individual or entity that is not a corporation, the possession, directly or indirectly, of the power to direct or cause the direction of the management or policies of the controlled individual or entity.

14. **Indemnification and Insurance.**

(a) LESSEE's General Agreement to Indemnify. The LESSEE releases the District, its officers, representatives, employees, agents, successors and assigns, (individually and collectively, "District Indemnatee") from, assumes any and all liability for, and agrees to indemnify the District Indemnatee against all claims, liabilities, obligations, damages, penalties, litigation, costs, charges, and expenses (including, without limitation, reasonable attorney's fees, engineers' fees, architects' fees, and the costs and expenses of appellate action, if any), imposed on, incurred by or asserted against the District Indemnatee or its interest in real property in the Leased Premises arising out of (i) the use or occupancy of the Leased Premises by the LESSEE, its officers, representatives, agents, and employees, (ii) the construction or operation of the Facilities by the LESSEE, its officers, representatives, agents, and employees, (iii) any claim arising out of the use, occupancy, operation, or construction of the Leased Premises by the LESSEE, its officers, representatives, agents, and

employees, and (iv) activities on or about the Leased Premises by the LESSEE, its officers, representatives, agents, and employees, of any nature, whether foreseen or unforeseen, ordinary, or extraordinary, in connection with the construction use, occupancy, operation, maintenance, or repair of the Facilities, or the Leased Premises by the LESSEE, its officers, representatives, agents, and employees, except to the extent any such claim, liability, obligation, damage or penalty is attributable to the negligence or willful misconduct of the District Indemnitee. The indemnity provided in this Section shall be to the fullest extent permitted by law, including, but not limited to, La. R. S. 9:322, and shall include within its scope any liability imposed by law on the District on a strict liability theory as landowner for physical defects in the Leased Premises (except for environmental contamination); it being the intention of the parties for LESSEE to assume liability for such defects in the Leased Premises during the term of this Lease. This Section shall include within its scope but not be limited to any and all claims or actions for wrongful death, but any and all claims brought under the authority of or with respect to any local, state, or federal environmental statute or regulation shall be covered by Section 14(b) and not this Section 14(a).

(b) *LESSEE's Environmental Indemnification.* The LESSEE agrees that it will comply with all environmental laws and regulations applicable to the LESSEE, including without limitation, those applicable to the use, storage, and handling of hazardous substances in, on, or about the Leased Premises. The LESSEE agrees to indemnify and hold harmless each District Indemnitee against and in respect of, any and all damages, claims, losses, liabilities, and expenses (including, without limitation, reasonable attorneys, accounting, consulting, engineering, and other fees and expenses), which may be imposed upon, incurred by, or assessed against any District Indemnitee by any other party or parties (including, without limitation, a governmental entity), arising out of, in connection with, or relating to the subject matter of: (a) the LESSEE's breach of the covenant set forth above in this Section 14(b), or (b) any environmental condition of contamination on the Leased Premises or any violation of any federal, state, or local environmental law with respect to the Leased Premises first occurring after the Lease Commencement Date and caused by the LESSEE's operations or facilities. For the avoidance of doubt, and notwithstanding anything to the contrary contained in this Lease, LESSEE shall not be responsible for any environmental contamination on the Leased Premises existing prior to the Lease Commencement Date, or liable for any damage or claims attributable to any such pre-existing contamination or with respect to the prior or future actions or activities of the LESSOR or any third party.

(c) *Burden of Proof.* The LESSEE, at its own cost, shall cause to be conducted a Phase I environmental assessment and, if indicated by such Phase I, a Phase II environmental assessment of the Leased Premises prior to the commencement of construction of the Facilities and a copy of all written reports issued in connection with such assessments shall be given to the District within ten (10) calendar days of completion. If, as a result of such assessments, environmental contamination of the Leased Premises is discovered, such contamination shall be deemed to have existed prior to the Lease Commencement Date. Any condition of environmental contamination discovered on the Leased Premises after the completion of the environmental assessments (Phase I and Phase II) which is not disclosed in the Phase I or Phase II environmental assessments shall be presumed, for purposes of the LESSEE's agreement to indemnify the District Indemnitee in Section 14(b), to have been caused by the LESSEE's operations or facilities, unless the LESSEE can demonstrate, by a preponderance of the evidence, that (i) such condition originated off the Leased Premises, or (ii) such condition was not caused by the LESSEE's operations or facilities. The provisions of this Section 14(c) are intended only to allocate the burden of establishing causation between the

LESSEE and the District with respect to environmental contamination discovered before and after the Lease Commencement Date. In no event shall any third party other than the District Indemnitee be entitled to any benefit, reliance, or presumption based on the provisions of causation or liability of either party with respect to any environmental contamination of the Leased Premises.

(d) *Defense & Settlement.* The indemnity obligations of LESSEE under Section 14(a) and Section 14(b) above shall be subject to the applicable District Indemnitee giving LESSEE prompt notice when any District Indemnitee becomes aware of any actual or threatened claim, action or administrative enforcement action which might give rise to a claim for indemnification under these provisions, including a description of the relevant facts and circumstances regarding any such actual or threatened claims or actions. Notice shall be prompt enough to allow LESSEE to respond to same in a timely fashion such that all material defenses, legal or factual, are preserved. LESSEE shall thereafter have sole responsibility and control over the defense and costs of defense, and any settlement, of any such claims or actions and any liability which arises as a result of any interference with LESSEE's right to control such defense, or any failure to cede same, shall not be within the scope of LESSEE's indemnity obligations hereunder; provided, however, to the extent (i) any District Indemnitees are dissatisfied with LESSEE's conduct of the defense any such claims or actions, (ii) LESSEE breaches its obligation to defend, or (iii) any District Indemnitees reasonably determine that the interests of LESSEE and the District Indemnitees are not materially aligned, such District Indemnitees may retain their own separate counsel, at their sole cost and expense (unless LESSEE is shown to be in breach of its obligations hereunder with regard to such claim or action) to protect the respective interests of the District Indemnitees. Similarly, LESSEE shall give LESSOR prompt notice when it becomes aware of any or actual or threatened claim, action or administrative enforcement action which might give rise to a claim for indemnification under these provisions.

(e) *Survival of Indemnities.* The foregoing indemnities shall survive the expiration or other termination of this Lease and shall be the sole and exclusive remedy of District and the District Indemnitees with regard to any and all damages, claims, losses, liabilities, and expenses (including, without limitation, reasonable attorneys, accounting, consulting, engineering, and other fees and expenses) ("Claims"), which are within the scope of the above stated indemnities.

(f) *Insurance.*

(i) At all times during the term of this Lease, at its sole expense, LESSEE shall maintain or cause to be maintained for the protection of LESSEE and LESSOR, commercial general liability insurance applying to the use and occupancy of the Leased Premises and the business operated by LESSEE on the Leased Premises, which shall be written to apply to bodily injury (including death), property damage and personal injury losses, and shall be endorsed to include LESSOR as an additional insured. Such insurance shall have a minimum combined single limit of liability of at least \$10,000,000.00 per occurrence and a general aggregate limit of at least \$20,000,000.00, and LESSEE shall provide, in addition, excess liability insurance on a following form basis, with overall limits of at least \$10,000,000.00.

(ii) At all times during the term of this Lease, LESSEE shall maintain in effect policies of insurance covering the Facilities during the term of this Lease in an amount

reasonably determined by LESSEE, providing protection against any peril included within the classification “all risk coverage” or “causes of loss special form” (as such terms are used in the State of Louisiana), including vandalism and malicious mischief. LESSEE shall be entitled to all proceeds of such insurance, and the value of the Facilities shall be determined by LESSEE.

(iii) All insurance required to be carried under this Lease shall be issued by responsible insurance companies. Insurance companies rated A-VII or better by Best’s Insurance Reports shall be deemed acceptable. Each insurance policy carried by LESSEE in accordance with this Lease shall include a waiver of the insurer’s rights of subrogation to the extent necessary to give effect to the release and shall name the District as an additional named insured. The foregoing waiver shall be effective whether or not a waiving party shall obtain and maintain the insurance which such waiving party is required to obtain and maintain pursuant to this Lease.

15. **Severability.** If any provision of this Lease or the application thereof to any person, place or circumstance shall be held by a court of competent jurisdiction, in a final and unappealable decision, to be invalid, unenforceable or void, then the remainder of the Lease and such provisions as applied to other persons, places, and circumstances shall remain in full force and effect, unimpaired by the holding, it being the intent of the parties that each and every provision of this Lease shall be enforceable to the fullest extent permitted by law.

16. **Notices.** All notices and correspondence between the parties shall be made or given in writing and shall be personally delivered, or delivered by facsimile or e-mail (provided, however, if any delivery is made by facsimile or e-mail, such delivery shall be deemed delivered only if the party giving such notice obtains a confirmation of receipt and also delivers such notice by means of another permitted method hereunder), or sent by registered or certified United States mail, postage prepaid, return receipt requested, or expedited prepaid delivery service, either commercial (such as UPS or FedEx) or United States Postal Service, to the applicable party or at the addresses set forth below, or such other address as may be furnished by notice in accordance with this Section 16:

If to LESSOR:

Lake Charles Harbor and Terminal District
Executive Director
751 Bayou Pines East, Suite P
Lake Charles, LA 70601
Email:
Fax:

with a copy to:

Lake Charles Harbor and Terminal District
General Counsel
751 Bayou Pines East, Suite P
Lake Charles, LA 70601

Email:
Fax:

If to LESSEE:

Magnolia LNG, LLC

Email:
Fax:

with a copy to:

Chad Mills
Sutherland, Asbill & Brennan, LLP
1001 Fannin Street, Suite 3700
Houston, TX 77002-6760
Email: chad.mills@sutherland.com
Fax: (713) 654-1301

Winfield E. Little, Jr.
616 Broad Street
P.O. Box 3759 (70602)
Lake Charles, LA 70601
Email: wlittle@littlelawfirm.com
Fax: (337) 430-0120

A notice shall be deemed to have been given: in the case of hand delivery, at the time of delivery; in the case of facsimile or e-mail, the time of confirmation of receipt; in the case of registered or certified mail, when delivered (as evidenced by the receipt) or the first attempted delivery on a business day; or in the case of expedited prepaid delivery, upon the first attempted delivery on a business day.

17. **Leasehold Mortgagee Provisions.** The provisions of this Section 17 shall supersede any contrary or inconsistent provisions in this Lease and in the event of any inconsistency or conflict between the provisions of this Section and any other provision of this Lease, the provisions of this Section shall govern and control.

(a) LESSEE's Right to Mortgage Leasehold Interest; Recognition of Leasehold Lender as Leasehold Mortgagee. LESSEE shall have the absolute right (but not the obligation), without seeking the consent or approval of LESSOR, to grant one or more leasehold mortgages encumbering LESSEE's interest in the Leased Premises and in this Lease. The term "Leasehold Lender" shall mean, at any point in time, the holder of a Leasehold Mortgage that provides written notice to LESSOR of its status as such. The term "Leasehold Mortgage" shall mean, at any point in time, a leasehold mortgage to secure debt or other equivalent instruments, as the case may be (as the same may be amended from time to time), encumbering LESSEE's interest

in the Leased Premises and this Lease. It is acknowledged and agreed that, during the term of this Lease, there may be multiple Leasehold Mortgages and multiple Leasehold Lenders and that each Leasehold Lender may, from time to time, assign its right, title and interest in and to the Leasehold Mortgage and this Lease.

(b) Right to Perform for LESSEE; Right to Cure.

(i) In addition to the rights provided in Section 17(a), LESSOR acknowledges and agrees that Leasehold Lender shall have the right to perform any term, covenant, condition or agreement to be performed by LESSEE under this Lease, and LESSOR shall accept such performance by Leasehold Lender with the same force and effect as if furnished by LESSEE. In the event of a default by LESSEE under this Lease and prior to any termination of this Lease by LESSOR, LESSOR acknowledges and agrees that LESSOR shall provide Leasehold Lender with notice of the same and Leasehold Lender shall have the right (but not the obligation) to commence to cure such default within the same period of time as LESSEE has under this Lease, plus an additional sixty (60) calendar days. LESSOR agrees that LESSOR shall not terminate this Lease in connection with any such default so long as Leasehold Lender has cured or commenced to cure and continues diligently to cure in accordance with the foregoing (A) any such non-payment default and (B) any such default in the payment of any portion of Base Rent or Additional Rent.

(ii) If any default in the performance of an obligation of LESSEE under this Lease is not susceptible to being cured by Leasehold Lender, LESSOR shall have no right to terminate this Lease with respect to such default and such default shall be deemed waived for the benefit of Leasehold Lender only, provided that:

(1) Leasehold Lender shall have commenced to cure (i) any other non-payment default of LESSEE that is susceptible to being cured by Leasehold Lender and (ii) any default in the payment of any portion of Base Rent or Additional Rent, in each case, within the time periods prescribed under Section 17(b)(i), above;

(2) Leasehold Lender (or its designee) shall have commenced to acquire LESSEE's interest in this Lease and the Leased Premises or to commence foreclosure or other appropriate proceedings under the Leasehold Mortgage within the time periods prescribed under Section 17(b)(i);

(3) if Leasehold Lender (or its designee) shall acquire LESSEE's interest in this Lease and/or the Leased Premises, Leasehold Lender (or its designee) shall, without prejudice to Section 17(e), (A) commence to cure and continue diligently to cure all non-payment defaults that are susceptible to being cured by Leasehold Lender with commercially reasonable diligence, (B) cure any payment default in respect of any portion of Base Rent or Additional Rent and (C) perform and observe all other agreements, covenants and conditions which are to be performed or observed by LESSEE under this Lease after the date of such acquisition; and

(4) if any third party shall, by foreclosure or *dation en paiement* under the Leasehold Mortgage or by assignment or other transfer from Leasehold Lender, acquire LESSEE's interest in and to the Leased Premises under this Lease, such third party shall, without prejudice to Section 17(e), (A) commence to cure and continue diligently to cure all non-payment defaults that are susceptible to being cured by a third party with commercially reasonable diligence, (B) cure any payment default in respect of any portion of Base Rent or Additional Rent and (C) perform and observe all other agreements, covenants and conditions which are to be performed or observed by LESSEE under this Lease after the date of such acquisition.

However, if LESSEE is in default beyond applicable notice and cure periods under this Lease and Leasehold Lender fails to act under Section 17(b) above within the applicable time periods set forth in Section 17(b)(i), then notwithstanding any provision in this Section 17 to the contrary, LESSOR may exercise any right to terminate this Lease that LESSOR may have under Section 12 above.

(c) *No Modification Without Leasehold Lender's Consent.* Neither LESSOR nor LESSEE will amend, modify, cancel or surrender this Lease without Leasehold Lender's prior written consent, and any such action taken without Leasehold Lender's consent shall not be binding on LESSEE or Leasehold Lender or their respective successors and assigns (and this Lease shall be interpreted as if such action was not taken), provided, however, that if LESSEE is in default beyond applicable notice and cure periods under this Lease and Leasehold Lender fails to act under Section 17(b) above within the applicable time periods set forth in Section 17(b), then Leasehold Lender's prior written consent shall not be required for LESSOR to exercise any right to terminate this Lease that LESSOR may have under Section 12 above.

(d) *Delivery of Notices.* LESSOR shall simultaneously deliver to Leasehold Lender copies of all notices, statements, information and communications delivered or required to be delivered to LESSEE pursuant to this Lease, including, without limitation, any notice of any default by LESSEE. In addition, LESSOR shall promptly notify Leasehold Lender in writing of any failure by LESSEE to perform any of LESSEE's obligations under this Lease. No notice, statement, information or communication given by LESSOR to LESSEE shall be binding or affect LESSEE or Leasehold Lender or their respective successors and assigns unless a copy of the same shall have simultaneously been delivered to Leasehold Lender in accordance with this Section 17(d). All notices to Leasehold Lender shall be addressed to any Leasehold Lender at any address that such Leasehold Lender shall provide in writing to LESSOR and LESSEE, and shall be delivered in a manner permitted under (and shall be deemed delivered in accordance with) Section 16. Notwithstanding anything to the contrary in this Lease, LESSOR shall not exercise any remedies related to LESSEE's default hereunder until (x) LESSOR has delivered notice of such default to Leasehold Lender pursuant to this Section 17(d) and (y) all applicable cure commencement periods following the delivery of such notice have expired.

(e) *Leasehold Lender Not Obligated Under Lease; Permitted Transfers.* The granting of the Leasehold Mortgage shall not be deemed to constitute an assignment or transfer of this Lease or the Leased Premises to Leasehold Lender, nor shall Leasehold Lender, in its capacity as the holder of the Leasehold Mortgage, be deemed to be an assignee or transferee of

this Lease or of LESSEE's interests in the Leased Premises thereby created so as to require Leasehold Lender, as such, to assume the performance of any of the terms, covenants or conditions on the part of LESSEE to be performed thereunder. In no event shall any act or omission of Leasehold Lender (including, without limitation, the acquisition of LESSEE's interest in this Lease and the Leased Premises created thereby in a transaction described in this Section 17 or the taking of possession of the Lease Premises or improvements thereon through a receiver or other means) require Leasehold Lender to assume, or cause Leasehold Lender to be deemed to have assumed, any obligation or liability of LESSEE under this Lease, and Leasehold Lender shall have no personal liability to LESSOR for LESSEE's failure to so perform and observe any agreement, covenant or condition of LESSEE under this Lease, it being expressly understood and agreed that, in the event of any such failure of LESSEE to perform, LESSOR's sole and exclusive remedy with respect to Leasehold Lender shall be to terminate this Lease without any recourse or claim for damages against Leasehold Lender, provided that this Section 17(e) shall not relieve Leasehold Lender of the requirements under Section 17(b)(ii)(3) in the event that Leasehold Lender has elected to acquire LESSEE's interests in this Lease and/or the Leased Premises.

(f) Permitted Transfers. Notwithstanding the provisions of Section 17(e), but for the avoidance of doubt while reserving LESSOR's right to terminate this Lease pursuant to Section 17(b), the purchaser at any sale of this Lease and the interests in and to the Leased Premises thereby created in any proceedings for the foreclosure of the Leasehold Mortgage (including, without limitation, power of sale), or the assignee or transferee of this Lease and the interests in and to the Leased Premises thereby created under any instrument of assignment or transfer in lieu of the foreclosure (whether to Leasehold Lender or any third party) shall be deemed to be a permitted assignee or transferee under this Lease without the need to obtain LESSOR's consent under Section 13 of this Lease and LESSOR shall recognize such assignee or transferee as the successor-in-interest to LESSEE for all purposes under this Lease, and such purchaser, assignee or transferee shall be deemed to have agreed to perform all of the terms, covenants and conditions on the part of LESSEE to be performed under this Lease from and after the date of such purchase and/or assignment, but only for so long as such purchaser or assignee is the owner of the LESSEE's interest in, to and under this Lease and the LESSEE's interests in and to the Leased Premises thereby created.

(g) No Termination for Casualty. So long as the indebtedness, or any part of the indebtedness, secured by the Leasehold Mortgage remains outstanding and unpaid, and the Leasehold Mortgage remains of record, LESSOR and LESSEE agree that the provisions of Section 9(a) shall not be amended, and shall control in the event of any by fire or other casualty of all, substantially all, or any part of the Leased Premises or the LESSEE's Facilities.

(h) Expropriation and Expropriation Proceeds. So long as the indebtedness, or any part of the indebtedness, secured by the Leasehold Mortgage remains outstanding and unpaid, and the Leasehold Mortgage remains of record, LESSOR and LESSEE agree that the provisions of Section 9(b) shall not be amended, and shall control in the event of a taking or expropriation pursuant to an eminent domain proceeding of all, substantially all, or any part of the Leased Premises, and further agree that: (1) any and all awards for any taking or expropriation of the Facilities and/or LESSEE's interest in, under and to this Lease which otherwise belong to LESSEE shall be payable to Leasehold Lender, to be disbursed as follows: (A) first, to

Leasehold Lender for the value of the interests in and to the Leased Premises created by this Lease and the value of the leasehold improvements located on the Leased Premises, up to an amount equaling the outstanding principal balance of any loan secured by the Leasehold Mortgage, and any interest accrued thereon, and (B) second, to LESSOR and LESSEE in accordance with this Lease; and (2) Leasehold Lender shall have the right to apply the expropriation proceeds payable to Leasehold Lender hereunder in accordance with the terms of the Leasehold Mortgage (or other applicable loan documents) and shall be entitled at Leasehold Lender's option to participate in any compromise, settlement or adjustment with respect to the claim for damages paid by the expropriating authority for the taking or expropriation of the Facilities and/or LESSEE's interest in, under and to this Lease; provided that this Section 17(h) does not derogate LESSOR's right to terminate this Lease pursuant to Section 17(b).

(i) New Direct Lease.

(i) If this Lease is canceled or terminated for any reason (except in connection with a Bankruptcy Proceeding, for which the provisions of Section 17(j) below are hereby agreed upon by LESSOR and LESSEE), and provided that Leasehold Lender has (A) commenced to cure and continues diligently to cure all non-payment defaults that are susceptible to being cured by Leasehold Lender with commercially reasonable diligence, and (B) cured any payment default in respect of any portion of Base Rent or Additional Rent, LESSOR hereby agrees that LESSOR shall, upon Leasehold Lender's written election within one hundred twenty (120) calendar days of such cancellation or termination, promptly enter in a new, direct lease with Leasehold Lender (or its nominee or any other party which Leasehold Lender may designate, including without limitation, LESSEE) with respect to the Leased Premises on the same terms and conditions as this Lease (a "New Lease"), it being the intention of the parties to preserve this Lease and the interests in and to the Leased Premises created by this Lease for the benefit of Leasehold Lender without interruption. Said New Lease shall be superior to all rights, liens and interests intervening between the date of this Lease and the granting of the New Lease and shall be free of any and all rights of LESSEE under this Lease.

(ii) LESSEE and LESSOR acknowledge and agree that Leasehold Lender shall have the right to encumber such direct New Lease and the estate created thereby with a deed of trust or a mortgage (as the case may be) on the same terms and with the same lien priority as the Leasehold Mortgage, it being the intention of the parties to preserve the priority of the Leasehold Mortgage, this Lease and the interests in and to the Leased Premises created by this Lease for the benefit of Leasehold Lender without interruption. If this Lease is rejected, cancelled or terminated for any reason and Leasehold Lender, its nominee or a designee of Leasehold Lender enters into a direct New Lease with LESSOR with respect to the Leased Premises, LESSOR hereby agrees that it will execute such documents as Leasehold Lender may require in order to ensure that the new direct lease provides for customary leasehold mortgagee protections, including without limitation, protections similar to those contained herein.

(j) Bankruptcy. In the event of a proceeding under the United States Bankruptcy Code (Title 11 U.S.C.) as now or hereafter in effect (a "Bankruptcy Proceeding"):

(i) If this Lease is rejected in connection with a Bankruptcy Proceeding by LESSEE or a trustee in bankruptcy (or other party to such proceeding) for LESSEE, such rejection shall be deemed an assignment by LESSEE to the Leasehold Lender of the Lease Premises and all of LESSEE's interest under this Lease, and this Lease shall not terminate and the Leasehold Lender shall have all rights and obligations of the LESSEE as if such Bankruptcy Proceeding had not occurred, unless Leasehold Lender shall reject such deemed assignment by notice in writing to LESSOR within thirty (30) calendar days following rejection of this Lease by LESSEE or LESSEE's trustee in bankruptcy. If any court of competent jurisdiction shall determine that this Lease shall have been terminated notwithstanding the terms of the preceding sentence as a result of rejection by LESSEE or the trustee in connection with any such proceeding, the rights of Leasehold Lender to a New Lease from LESSOR pursuant to Section 17(i) hereof shall not be affected thereby.

(ii) In the event of a Bankruptcy Proceeding against LESSOR:

(1) If the bankruptcy trustee, LESSOR (as debtor-in-possession) or any party to such Bankruptcy Proceeding seeks to reject this Lease pursuant to United States Bankruptcy Code §365(h)(1), LESSEE shall not have the right to treat this Lease as terminated except with the prior written consent of Leasehold Lender and the right to treat this Lease as terminated in such event shall be deemed assigned to Leasehold Lender, whether or not specifically set forth in the Leasehold Mortgage, so that the concurrence in writing of LESSEE and the Leasehold Lender shall be required as a condition to treating this Lease as terminated in connection with such Bankruptcy Proceeding.

(2) Unless this Lease is treated as terminated in accordance with Section 17(j)(ii)(1) above, then this Lease shall continue in effect upon all the terms and conditions set forth herein, including Rent, but excluding requirements that are not then applicable or pertinent to the remainder of the term of this Lease. Thereafter, LESSEE or its successors and assigns shall be entitled to any offsets against Rent payable hereunder for any damages arising from such bankruptcy, to the extent LESSEE's operation of business has been materially interfered with, and any such offset properly made shall not be deemed a default under this Lease. The lien of the Leasehold Mortgage shall extend to the continuing possessory rights of LESSEE following such rejection with the same priority as it would have enjoyed had such rejection not taken place.

(k) Estoppel Certificates.

(i) Upon Leasehold Lender's or LESSEE's written request, LESSOR shall provide Leasehold Lender or LESSEE with an estoppel certificate which shall certify to such requesting Leasehold Lender or LESSEE (1) as to the amount and status of all Rent payments and security deposits, if any, under this Lease, (2) as to the non-satisfaction or non-compliance by LESSEE of any other conditions under this Lease, or alternatively, as to the full satisfaction and compliance by LESSEE of any other conditions required under this Lease, (3) as to any existing default of LESSEE under the Lease, or alternatively that LESSEE is not in default in the payment, performance or observance of any other

condition or covenant to be performed or observed by LESSEE thereunder, (4) setting forth any offsets or counterclaims on the part of LESSOR or alternatively that there are no offsets or counterclaims on the part of LESSOR, and (5) as to such other matters related to this Lease as Leasehold Lender may reasonably determine from time to time.

(ii) Upon Leasehold Lender's or LESSOR's written request, LESSEE shall provide Leasehold Lender with an estoppel certificate which shall certify to such requesting Leasehold Lender (1) as to the amount and status of all Rent payments and security deposits under this Lease, (2) as to the non-satisfaction or non-compliance by LESSOR of any other conditions under this Lease, or alternatively, as to the full satisfaction and compliance by LESSOR of any other conditions required under this Lease, (3) as to any existing default of LESSOR under the Lease, or alternatively that LESSOR is not in default in the payment, performance or observance of any other condition or covenant to be performed or observed by LESSOR thereunder, (4) setting forth any offsets or counterclaims on the part of LESSOR or alternatively that there are no offsets or counterclaims on the part of LESSEE, and (5) as to such other matters related to this Lease as such Leasehold Lender may reasonably determine from time to time.

(l) No Merger. There shall be no merger of this Lease or any interest in this Lease or of the interests in and to the Leased Premises created thereby with the fee estate in the Leased Premises, by reason of the fact that this Lease or such interest therein, may be directly or indirectly held by or for the account of any person who shall hold any interest in the fee estate in the Leased Premises, nor shall there be such a merger by reason of the fact that all or any part of the interests in and to the Leased Premises created by this Lease may be conveyed or mortgaged in a leasehold mortgage, deed of trust, deed to secure debt or other equivalent instrument (as the case may be) to a mortgagee or beneficiary who shall hold any interest in the fee estate in the Leased Premises or any interest of LESSOR under this Lease.

(m) LESSOR's Recognition of LESSEE. LESSOR hereby recognizes LESSEE as the current tenant party to this Lease and acknowledges and agrees that LESSEE acquired its interest in this Lease and in and to the Leased Premises in accordance with the terms of this Lease.

(n) Agreement to Amend. LESSOR recognizes the importance of LESSEE's ability to obtain Leasehold Mortgages, and that the provisions of this Lease may be subject to the approval of a Leasehold Lender. If any Leasehold Lender should require, as a condition to such financing, any reasonable modifications of this Lease, whether for purposes of clarifying the provisions of this Lease or to include provisions then customary for leasehold financing transactions, LESSOR agrees to execute the appropriate amendments to this Lease; provided, however, that no such modification shall, to the detriment of LESSOR, impair any of LESSOR's rights, as reasonably determined by LESSOR or increase any of LESSOR's obligations, as reasonably determined by LESSOR, under this Lease.

(o) Third-Party Beneficiary. Notwithstanding anything to the contrary in this Lease, each Leasehold Lender shall be a third-party beneficiary solely and exclusively with respect to the provisions of this Section 17. There are no other third-party beneficiaries to this Lease.

(p) Subordination of LESSOR's Lien. LESSOR hereby subordinates any lien or privilege it may have on any movables found from time to time in or upon the Leased Premises, including without limitation, LESSOR's privileges pursuant to La. Civil Code Articles 2707, *et seq.*, to any Leasehold Lender's rights under this Section 17 and the lien of any Leasehold Mortgage.

(q) Letter of Credit. LESSOR's right to draw on the Letter of Credit in accordance with Section 18 below if LESSEE is in default under this Lease beyond applicable notice and cure periods shall not be limited by anything in this Section 17, even if the Leasehold Lender issues the Letter of Credit.

(r) No Waiver. Neither acceptance of Rent by LESSOR nor failure by LESSOR to complain of any action, non-action or default of LESSEE, whether singular or repetitive, shall constitute a waiver of any of LESSOR's rights hereunder. Waiver by LESSOR of any right pertaining to any default of LESSEE shall not constitute a waiver of any right for either a subsequent default of the same obligation or any other default. No act or thing done by LESSOR or LESSOR's agents shall be deemed to be acceptance of surrender of the Leased Premises and no agreement to accept a surrender of the Leased Premises shall be valid unless it is in writing and signed by LESSOR.

18. Parent Company Guaranty or Credit Support. Liquefied Natural Gas, Limited has executed this Lease below to guaranty, in full, all the obligations of LESSOR in favor of LESSOR in respect of LESSEE's obligations under this Lease. However, LESSEE shall be entitled, at any time on or after the Lease Commencement Date, to deliver to LESSOR (i) an irrevocable stand-by letter of credit in the form of Exhibit C, naming LESSOR as beneficiary, in an amount equal to the Required Amount as of such time, and issued by a Creditworthy Bank (a "Letter of Credit") or (ii) one or more replacement guarantees from Affiliates of LESSEE acceptable to LESSOR. If LESSEE delivers a Letter of Credit to LESSOR or such replacement guarantee, LESSOR shall execute a written termination and release of all of the obligations of Liquefied Natural Gas, Limited under its guaranty as soon as practicable (but, in any event within ten (10) calendar days) after LESSOR's receipt of the Letter of Credit or such replacement guarantee. LESSOR shall have the right to draw down on or collect against the Letter of Credit upon LESSOR's demand in the event that LESSEE has breached any of its obligations under this Lease and such breach has not been cured within the applicable cure period set forth in Section 12(a) in an amount not exceeding the LESSOR's damages for such breach. LESSOR shall not draw an amount on the Letter of Credit that is greater than the then outstanding unpaid amount that is the subject of such breach, and all amounts drawn under the Letter of Credit shall be deemed applied to such outstanding unpaid amount. If at any time, the amount available for drawing under a Letter of Credit exceeds the Required Amount at such time, then provided that LESSEE is not then in default beyond applicable notice and cure periods, LESSEE shall be entitled to reduce the available amount of the Letter of Credit to an amount at least equal to the Required Amount by submitting to the issuing bank a certificate in the applicable form attached to the Letter of Credit jointly signed by LESSEE and LESSOR, and LESSOR shall promptly execute such a certificate tendered by LESSEE if the foregoing condition to such reduction has been satisfied. If Lessee delivers a Letter of Credit and such Letter of Credit has a term that expires prior to the Expiration Date, then LESSEE shall, not less than forty five (45) calendar days prior to the expiring Letter of Credit's expiration date, deliver

a replacement Letter of Credit that is in an amount equal to the Required Amount or one or more guarantees from Affiliates of LESSEE acceptable to LESSOR and which, in each case, is effective on or before the expiration date of the expiring Letter of Credit. If LESSEE fails to deliver a replacement Letter of Credit not less than thirty (30) calendar days prior to the Expiration Date of the expiring Letter of Credit, then LESSOR may draw the entire balance of the expiring Letter of Credit and hold those funds as security to set off against any and all amounts owed or to be owed by LESSEE to LESSOR under this Lease, and LESSOR shall return any such funds not applied to amounts owed by LESSEE in the event that LESSEE provides a replacement Letter of Credit or replacement guarantee in accordance with the foregoing. In this Lease, "Creditworthy Bank" means a commercial bank having at the applicable time a senior unsecured and un-credit-enhanced long term debt rating of: (a) A- or better from Standard & Poor's Corporation (or any successor rating agency thereof); or (b) A3 or better from Moody's Investor Services, Inc. (or any successor rating agency thereof). In this Lease, "Required Amount" means, as of any date in any Contract Year, the amount opposite such Contract Year in Exhibit D. Any assignee of LESSEE shall be obligated to provide replacement credit support in accordance with this Section 18.

19. **Subleasing.** LESSEE shall have the right to sublease any or all of the Leased Premises, subject to the written consent of LESSOR, which consent shall not be unreasonably withheld, conditioned or delayed by LESSOR, provided that LESSEE is not in default beyond applicable notice and cure periods under this Lease. Unless specifically agreed and consented to by LESSOR, no such subleasing shall relieve LESSEE of LESSEE's obligations hereunder. In the event that LESSEE enters into any such sublease, at the request of the sublessee, LESSOR shall enter into a direct agreement with such sublessee, (a) providing that if this Lease is cancelled or terminated, LESSOR shall enter into a direct New Lease with such sublessee for the balance of the term of this Lease and otherwise on substantially the same terms and conditions as this Lease, and (b) containing lender provisions substantially similar to those set forth in Section 17.

20. **Memorandum.** At LESSEE's option, LESSOR and LESSEE shall each execute and have acknowledged a memorandum of this Lease as of the Lease Commencement Date, and LESSEE shall cause the executed and acknowledged memorandum to be recorded in the Official Records.

21. **Authority.** Each party to this Lease represents and warrants to each other party to this Lease that (a) the representing party has the unrestricted right, power and authority to execute, deliver and perform this Lease and to enter into this Lease as contemplated hereunder, (b) the person signing this Lease on behalf of the representing party is authorized to do so, (c) the representing party has taken all governmental (in the case of any party that is a public entity) or company (in the case of any party that is a private entity) actions necessary to authorize the execution, delivery and performance of this Lease, (d) the performance by the representing party of its duties, obligations and responsibilities under this Lease will not violate or constitute a default under the terms and provisions of its charter, articles of organization or operation agreement, any applicable law, or any material agreement, document or instrument to which it is a party or by which it or the Leased Premises are bound or affected, (e) no further consent of any person or entity is required in connection with the representing party's execution, delivery or performance of this Lease, (f) when signed by the representing party, this Lease constitutes a valid and binding agreement enforceable against such party in accordance with its terms (except

as such enforcement may be limited by the effect of bankruptcy, insolvency, reorganization, receivership, conservatorship, moratorium or other applicable laws relating to the rights of creditors generally, or the rules governing the availability of specific performance, injunctive relief or other equitable remedies and general principles of equity, regardless of whether considered a proceeding in equity or at law). The District further represents and warrants to LESSEE that it is not immune from suit or judgment resulting from any claim or action brought against it by the LESSEE pursuant to the express terms of this Lease.

22. **Governing Law and Venue.** This Lease shall be governed by and interpreted in accordance with the laws of the State of Louisiana, excluding conflicts of laws principles. If the parties are unable to resolve amicably any dispute arising out of or in connection with this Lease, they agree that, if permitted under applicable laws, such dispute shall be resolved in the state or federal courts located in Lake Charles, Louisiana

23. **Alternative Dispute Resolution.**

(a) *Executive Officers Meetings.* As a condition precedent to instituting any lawsuit relating to any claim, controversy or dispute arising under this Lease (a “Dispute”), the parties each agree to appoint an executive officer as its representative to resolve such dispute, and that such representatives must personally meet at a mutually acceptable date, time and location within fifteen (15) calendar days following the request of either party, in a good faith effort to resolve the dispute or disagreement. If such executive officer representatives cannot resolve the dispute, then each party agrees that the parties’ chief executive officers shall similarly meet personally at a mutually acceptable date, time and location within fifteen (15) calendar days following the meeting of representatives, in a good faith effort to resolve the dispute or disagreement. Failure of either party to timely attend such meeting shall constitute a breach of this Lease and, in such event, the condition precedent to initiating any litigation shall be deemed satisfied or waived.

24. **Entire Lease.** This Lease constitutes the entire agreement between LESSOR and LESSEE respecting the subject matter of this Lease. Any agreement, understanding or representation respecting the Leased Premises, this Lease, or any other matter referenced herein not expressly set forth in this Lease or a subsequent writing signed by both parties is null and void. This Lease shall not be modified or amended except in a writing signed by both parties. No purported modifications or amendments, including without limitation any oral agreement (even if supported by new consideration), course of conduct or absence of a response to a unilateral communication, shall be binding on either party.

25. **Counterpart Signatures.** This Agreement may be executed with counterpart signature pages and in duplicate originals, each of which shall be deemed an original, and all of which together shall constitute a single instrument.

26. **26. Force Majeure.** In the event that LESSEE shall be delayed or hindered in or prevented from the performance of any act required hereunder (other than payment of Base Rent or Additional Rent) by reason of any event that is outside the reasonable control of LESSEE, including, but not limited to, strikes, lock-outs, labor troubles, inability to procure materials, failure of power, restrictive governmental laws or regulations, changes in governmental laws or

regulations, delay in obtaining permits beyond the time periods for obtaining permits that existed as of the Lease Commencement Date (provided that such delay did not result from failure of LESSEE to comply with the clear requirements of the permitting office), riots, insurrection, civil unrest, war, terrorist act, act of a public enemy, sabotage, blockade, embargo, hurricane, fire, flood, tornado, earthquake, storm, lightning, washout, explosion, or other reason of a like nature not the fault of the party delayed in performing work or doing acts required under the terms of this Lease (“Force Majeure Event”), then performance of such act shall be excused temporarily but shall accrue during the period of the delay and the period for the performance of any such act shall be extended for a period equivalent to the period of such delay. The provisions of this Section 26 shall not relieve LESSEE of any of its other obligations hereunder nor operate to excuse LESSEE from prompt payment of all Base Rent or Additional Rent. Notwithstanding anything to the contrary contained in this Lease, in the event of a Force Majeure Event, the prolonged effects of which prevent the commercially reasonable use of the Leased Premises or the Facilities (or the construction or reconstruction of the Facilities following a casualty or Force Majeure Event), for more than twelve (12) consecutive months, then LESSEE shall have the right to terminate this Lease by giving notice to LESSOR. **Relationship of Parties.** Nothing contained in this Lease and no course of dealing between the parties shall be construed so as to constitute a joint venture or partnership between LESSOR and LESSEE.

27. **Successors.** The covenants, agreements, terms, provisions and conditions contained in this Lease shall apply to and inure to the benefit of and be binding upon the LESSOR and the LESSEE and their respective successors and assigns, and shall be construed as covenants running the respective interests of the parties hereto.

28. **Severability.** If any term or provision of this Lease is found to be invalid, illegal or unenforceable, the remaining terms and provisions hereof will not be affected thereby; and each term and provision hereof will be valid and enforceable to the fullest extent permitted by law.

29. **Headings.** The captions, section numbers and paragraph numbers appearing in this Lease are inserted only as a matter of convenience and in no way define, amplify, limit, construe or describe the scope or interest of any section of this Lease.

30. **Intentionally omitted.**

31. **No Waiver.** The failure of either party to exercise any power given to it hereunder, or to insist upon strict performance of any one or more of the obligations under this Lease, or to exercise any election contained in this Lease, shall not be construed as a waiver or relinquishment of the right to demand strict compliance with the terms hereof for the future performance of the terms and conditions of this Lease or of the right to exercise such election.

[Signatures on following pages]

EXECUTED this _____ day of _____, 2013.

WITNESSES:

LAKE CHARLES HARBOR AND
TERMINAL District

Print Name: _____

By: _____
William J. Rase, III, Executive Director

Print Name: _____

WITNESSES:

MAGNOLIA LNG, LLC

Print Name: _____

By: _____
Name: _____
Title: _____

Print Name: _____

WITNESSES:

Liquefied Natural Gas, Limited

By: _____
Name: _____
Title: _____

STATE OF LOUISIANA

PARISH OF _____

On this ____ day of _____, 2013, before me appeared William J. Rase, III, to me personally known, who, being by me duly sworn, did say that he is the Executive Director for LAKE CHARLES HARBOR AND TERMINAL District, and that the foregoing instrument was signed in behalf of said entity by authority of its Board of Commissioners, and said appearer acknowledged said instrument to be the free act and deed of said entity.

NOTARY PUBLIC

Printed Name: _____

Bar Roll/Notary No.: _____

Commission Expires: _____

STATE OF _____ :

COUNTY OF _____ :

On _____ before me, _____, Notary Public, personally appeared _____, who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of _____ that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

Signature _____

(Seal)

NOTARY PUBLIC

Printed Name: _____

Bar Roll/Notary No.: _____

Commission Expires: _____

Exhibit A

Legal Description of Leased Premises

Exhibit B

Corps letter – Dated January 25, 1994



DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT CORPS OF ENGINEERS

P.O. BOX 60267

NEW ORLEANS, LOUISIANA 70160-0267

January 25, 1994

EXHIBIT B

REPLY TO
ATTENTION OF:

Operations and Readiness Division
Surveillance and Enforcement Section

Mr. Ulysses J. de St. Germain, Jr.
Lake Charles Harbor & Terminal District
Post Office Box AAA
Lake Charles, Louisiana 70620-0AAA



Dear Mr. de St. Germain:

This is with reference to your letter of December 30, 1993, raising several questions regarding the Industrial Canal South Shore, (Devil's Elbow) area in Calcasieu Parish, Louisiana, as indicated on the attached map.

In response to the various points you raised, we have the following comments:

1. Is the site currently a designated Corps spoil disposal area with easements in effect? While it is true that the Corps did utilize this area for spoil disposal previously, we now have no need for further deposition there. We are currently making use of other sites for spoil disposal. The Corps has no spoil disposal easements on this site.

2. Do official jurisdictional determinations exist for the site other than for the extreme western end which is presently leased to the Marine Spill Response Corporation (MSRC)? Our letter of October 6, 1993, authorizing the installation of additional culverts, the excavation and improvement of existing drainage ditches, and the grading of surface undulations for tractor access without a permit under either Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act of 1899 is in effect a determination that jurisdictional wetlands do not occur on the site except for the extreme western end which is presently leased to the MSRC, and for which a permit has been issued.

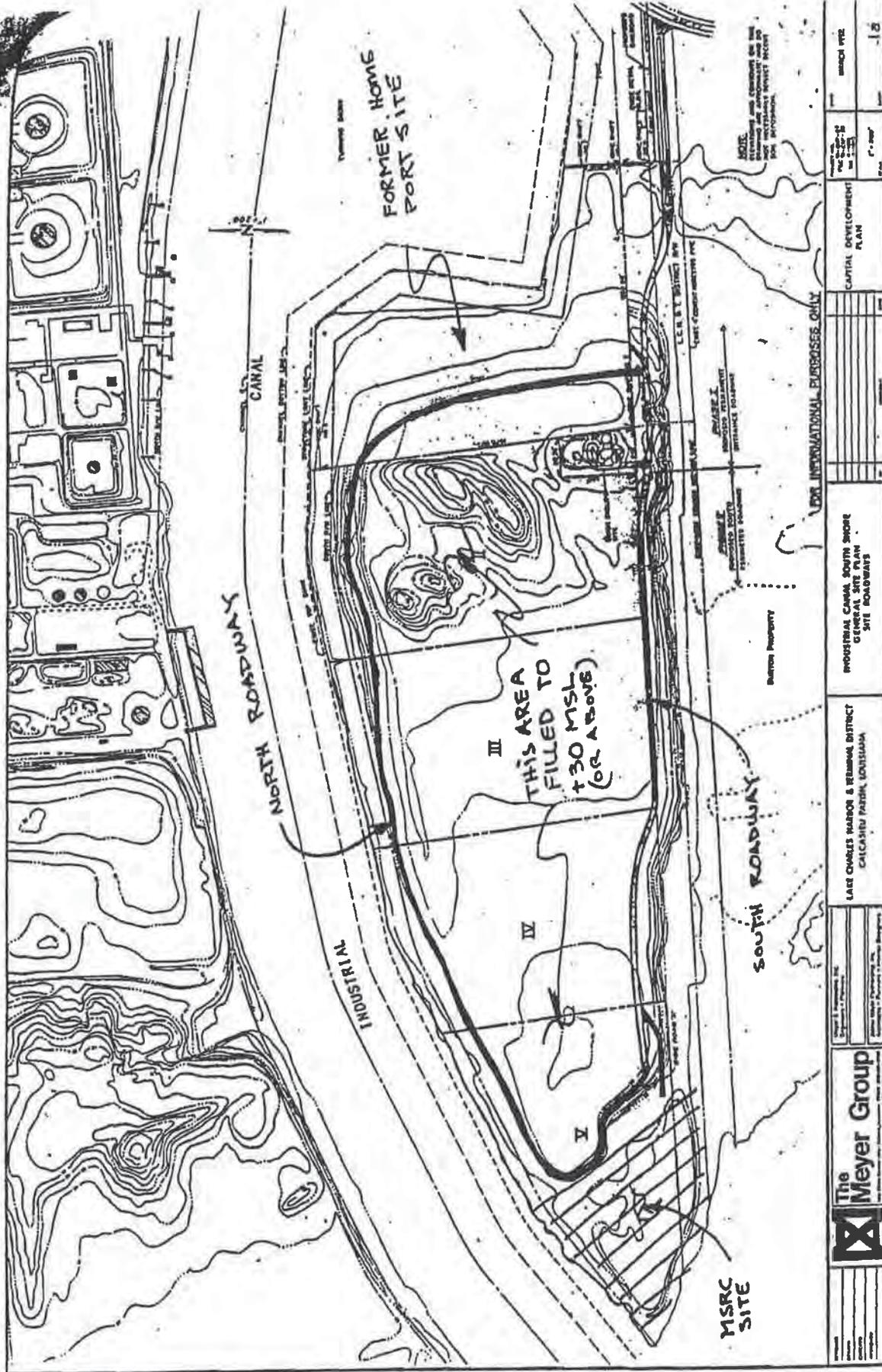
3. Do permits exist for work at the site other than that obtained by the MSRC? A search of our files reveals that the only permit that has been issued for this site is the one to the MSRC.

Should you have any questions regarding this matter, please contact Thom Davidson at the above address or by phone at (504) 862-2270.

Sincerely,

Ronald J. Ventolaja
Chief, Regulatory Functions Branch

Enclosure



NOTE: THIS PLAN AND CONTIGUOUS TO THE INDUSTRIAL CANAL SOUTH SHORE GENERAL SITE PLAN ARE SUBJECT TO THE CITY OF CHICAGO'S ZONING ORDINANCES AND ANY AMENDMENTS THERE TO.

		INDUSTRIAL CANAL SOUTH SHORE GENERAL SITE PLAN SITE ROADWAYS		CAPITAL DEVELOPMENT PLAN	
Project Name: _____ Project No.: _____ Drawing No.: _____	Date: _____ Scale: 1" = 100' Author: _____ Checker: _____	Date: _____ Scale: 1" = 100' Author: _____ Checker: _____	Date: _____ Scale: 1" = 100' Author: _____ Checker: _____	Date: _____ Scale: 1" = 100' Author: _____ Checker: _____	Date: _____ Scale: 1" = 100' Author: _____ Checker: _____

December 30, 1993

U.S. Army Corps of Engineers
Permits Section
P.O. Box 60267
New Orleans, LA 70160

ATTN: Mr. Ronald Ventola

RE: Industrial Canal South Shore (Devil's Elbow)

Dear Mr. Ventola,

This letter is to acknowledge your letter of October 6, 1993 (copy attached) which indicated a permit was not required for various improvements at the above subject site. Since receiving your letter, several issues have surfaced which the District feels require clarification.

The Industrial Canal was dredged a number of years ago and has been maintained by the Corps. The District's files contain limited information about the project in general and particularly as it relates to the site in question. The site has been used in the past as a spoil disposal area and the eastern end was to be a Navy home port prior to the Base Closure and Realignment Act of 1988. However, it is not clear if the site is currently a designated disposal area or if any easements for this use are still in effect.

The majority of the site has been filled 20 to 30 feet with spoil material above its original elevation of +10 MSL. However, our records do not indicate if a wetland delineation has been made to determine if the site and/or any portions thereof are jurisdictional wetlands with the exception of the extreme western end which was recently leased to the Marine Spill Response Corporation (MSRC). This portion of the site was at or near its original average elevation of +10 MSL and was considered a jurisdictional wetland.

The District is in the process of reviewing its long term development options for various properties. Major considerations include past uses, present permitted uses, proposed uses and regulatory constraints that would be associated with developing the properties. Based thereon, any historical file information you could furnish on this site which would clarify the above concerns would be most helpful.



**Lake Charles
Harbor
& Terminal
District**

Post Office Box AAA
Lake Charles, LA 70602
Phone 318-439-3661
Facsimile 318-493-3523

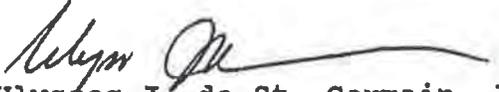
Ulysses J. de St. Germain, Jr.
Executive Director

U. S. Army Corps of Engineers
Page 2
December 30, 1993

Please advise if the site, as shown on the attached drawing, has any areas other than the MSRC area which would be considered jurisdictional wetlands under Section 404 of the Clean Water Act. Additionally, please advise whether or not the site is a dedicated spoil area and if so, whether the Corps would consider releasing the dedication.

Please advise if you have any questions or require any additional information.

Sincerely,


Ulysses J. de St. Germain, Jr.

USG:lsm

Attachment





		LAKE CHARLES HARBOR & TERREMIN DISTRICT CALCASIEU PARISH, LOUISIANA		INDUSTRIAL CANAL SOUTH SHORE GENERAL SITE PLAN SITE ROADWAYS		CAPITAL DEVELOPMENT PLAN		DATE: MARCH 1978	
The Meyer Group 1000 Poydras Street, Suite 2000 New Orleans, Louisiana 70112 Telephone: (504) 581-1000		Project: Industrial Canal South Shore Drawing: General Site Plan - Site Roadways Scale: 1" = 100' Date: March 1978		Sheet: 12 of 12		Author: [Blank]		Check: [Blank]	



DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS

P.O. BOX 60267

NEW ORLEANS, LOUISIANA 70160-0267

REPLY TO
ATTENTION OF

October 6, 1993



Operations & Readiness Division
Surveillance & Enforcement Section

Mr. John Polansky
Lake Charles Harbor & Terminal
Post Office Box AAA
Lake Charles, Louisiana 70602-0AAA

Dear Mr. Polansky:

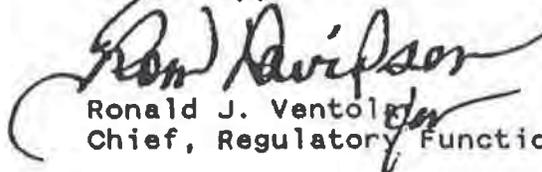
This is in regard to your letter of July 14, 1993, requesting a jurisdictional determination for your project to install additional culverts, excavate and improve existing ditches and grade undulations for tractor access in the spoil disposal area indicated on the attached map of the Industrial Canal, South Shore of the Lake Charles Harbor and Terminal District in Calcasieu Parish, Louisiana.

We have reviewed the information you have provided regarding this project, and have determined that no permit from the U.S. Army Corps of Engineers under either Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act of 1899 is required for this work.

This determination is only applicable to the permit program administered by the Corps of Engineers. It does not eliminate the need to obtain other Federal, state or local approvals before beginning the work.

Should you have any questions regarding this matter, please contact Thom Davidson at (504) 862-2270.

Sincerely,


Ronald J. Ventola
Chief, Regulatory Functions Branch

Enclosure

④
ICSS

July 14, 1993

U. S. Army Corps of Engineers
Permits Section
P. O. Box 60267
New Orleans, LA 70160

Attn: Mr. Ronald Ventola

RE: Maintenance of Dredged Material Disposal Area

Dear Mr. Ventola:

This letter is to provide you with the planned scope of maintenance of the dredged material disposal area on the south shore of the Industrial Canal (Devil's Elbow) and to request guidance relative to permit requirements for the planned activity.

As shown on the attached drawing, the site was used for disposal of dredged material from the Industrial Canal with an average elevation of +30 MSL. It was to be one of the Navy's home port facilities prior to the Base Closure and Realignment Act of 1988. The subsequent closure of the facility has resulted in the maintenance of the area resting with the District.

The District has previously received approval from your office to construct and maintain access roads around the perimeter of the site. These roads were constructed on top of the perimeter levee which was constructed at an elevation approximately two (2) feet higher than the surface of the dredged material. Due to this elevation differential, the site held water and, according to Parish officials, added significantly to the mosquito population. The construction of the roads and the associated drainage improvements have significantly reduced the amount of standing water which has eliminated most large breeding areas. Regular mowing of accessible areas has aided the growth of ground cover which has reduced surface cracking and eliminated additional breeding areas.



Lake Charles
Harbor
& Terminal
District

Post Office Box AAA
Lake Charles, LA 70602
Phone 318-439-3661
Telex 502449 Portlkchas
Facsimile 318-493-3523

Mr. Ronald Ventola
U. S. Army Corps of Engineers
Page 2
July 14, 1993

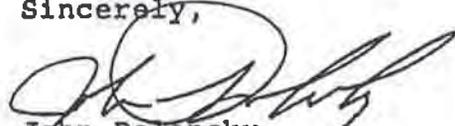
In addition to the above, the underlying dredged material has a high moisture content and in some areas is unstable. Based upon this condition, the District is concerned about the integrity of sections of the perimeter levee. Regular mowing of the levee slopes has aided the growth of ground cover which has reduced sloped erosion. However, slope erosion has been experienced at several drainage outfalls. To eliminate the erosion, additional drainage culverts through the levee and interconnecting drainage ditches are necessary to reduce the volume of water flowing through any one culvert. This work, along with some minor grading, will improve the site so that it can be mowed and properly drained.

Based upon the foregoing and as discussed with Mr. Serio, the following specific items of work are planned.

1. Install additional culverts through the perimeter levee.
2. Excavate new ditches and improve existing ditches to interconnect the culverts and balance flow rates.
3. Grade undulations at localized impassable areas to the extent necessary to enable access for tractor mounted mowers.

Please advise at your earliest convenience if any permits will be necessary for this work or of any other limitations.

Sincerely,


John Polansky
Director of Maintenance

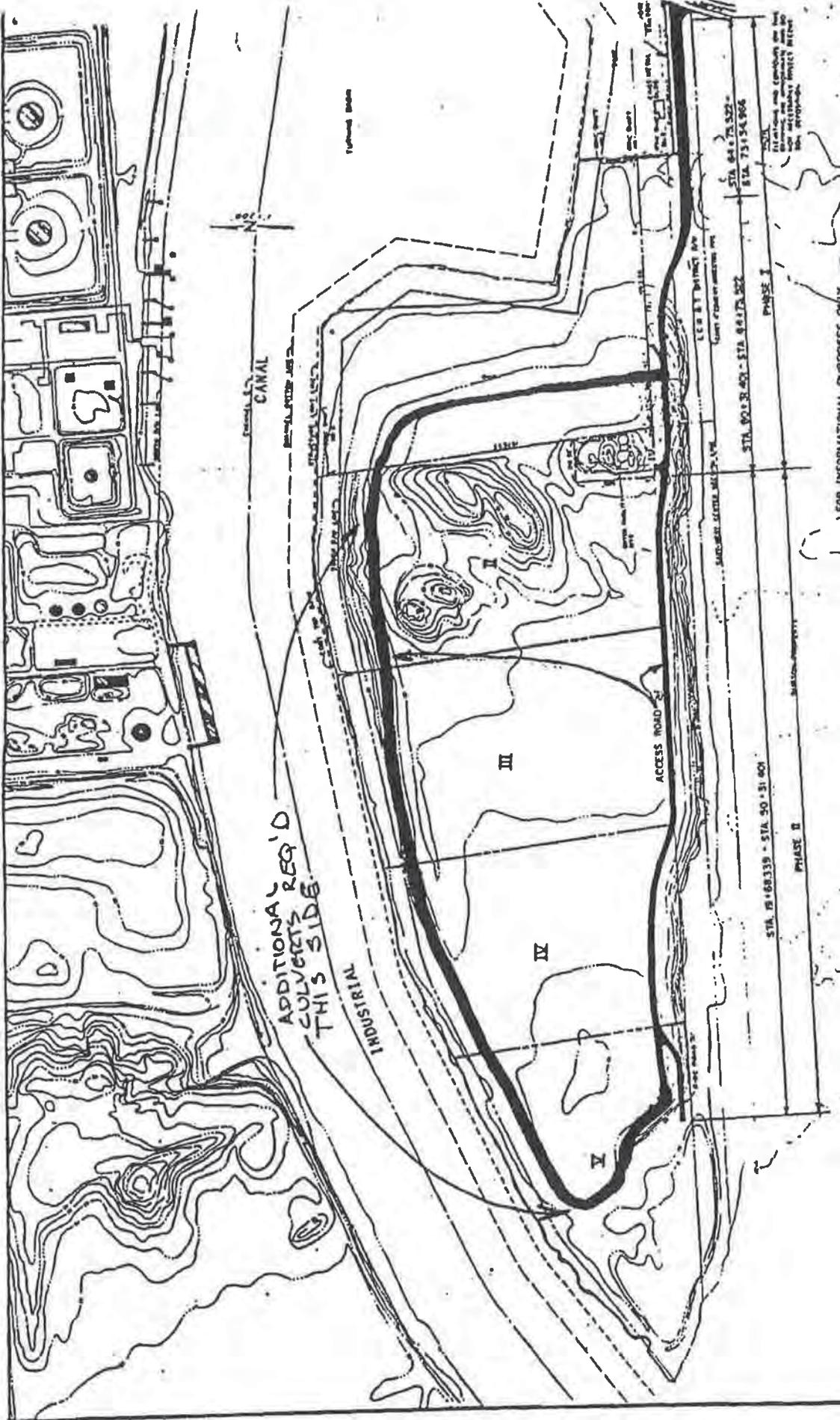
✓JP:lsm

Attachment

CC: Mr. Ulysses J. de St. Germain, Jr.
Executive Director

Mr. Michael K. Dees
General Counsel





		LAKE CHARLES HARBOR & TERMINAL DISTRICT CALCASIEU PARISH, LOUISIANA		INDUSTRIAL CANAL SOUTH SHORE GENERAL SITE PLAN SEE ROADWAYS		CAPITAL DEVELOPMENT PLAN		DATE: 12-15-10 DRAWN BY: J.S.B. CHECKED BY: P. J. BERRY		SHEET NO. 10	
FOR INFORMATIONAL PURPOSES ONLY											



DEPARTMENT OF THE ARMY
NEW ORLEANS DISTRICT, CORPS OF ENGINEERS
P.O. BOX 60267
NEW ORLEANS, LOUISIANA 70160-0267

(f)
91CIP3738



REPLY TO
ATTENTION OF:

March 31, 1992

Operations & Readiness Division
Surveillance & Enforcement Section

Mr. Charles W. Stutes
Meyer and Associates
Post Office Box 2149
Sulphur, Louisiana 70664-2149

Dear Mr. Stutes:

This is in regard to your letter of March 13, 1992, concerning the proposed project of your client, the Lake Charles Harbor and Terminal District, to make roadway improvements to existing access roads located along the south property line of the site. We understand that Phase I improvements will generally consist of earthwork necessary to provide a suitable alignment and grade within acceptable design standards, placement of geotextile fabric, a stone base course and PCC pavement. Phase II improvements will generally consist of a minimal grading and leveling, placement of geotextile fabric, and placement of a limestone surface course.

Based on a review of the information you have provided, we have determined that no permit is required from the US Army Corps of Engineers for the work your client proposes.

This determination is only applicable to the permit program administered by the Corps of Engineers. It does not eliminate the need to obtain other Federal, state or local approvals before beginning the work.

Should you have any questions regarding this matter, please contact Dr. Thom Davidson at (504) 862-2270.

Sincerely,

Ronald J. Ventola
Chief, Regulatory Functions Branch
Operations and Readiness Division

(2)



Meyer and Associates, Inc.
Engineers • Planners

Vernon F. Meyer, P.E.
President
Richard T. Meyer, P.E.
Vice-President

March 13, 1992

U. S. Army Corps of Engineers
Post Office Box 60267
New Orleans, LA 70160-0267

ATTENTION: MR. RONALD J. VENTOLA, CHIEF
REGULATORY FUNCTIONS BRANCH
OPERATIONS READINESS DIVISION

Re: Lake Charles Harbor and Terminal District
Access Roadway at Industrial Canal
South Shore, Phase I and II
PLC No. 91-CIP-37 and 38
MA Project No. 4-10113, 4-10123

Gentlemen:

This letter is to advise you of additional planned improvements at the Industrial Canal South Shore and request review and approval of the work described herein. On January 21, 1992, Mr. John Polansky, Director of Maintenance at the Lake Charles Harbor and Terminal District, forwarded a letter to your office advising you of work proposed at the site. On January 27, 1992, your office provided written confirmation that no Corps permit was necessary for the required work. As consulting engineers for the Lake Charles Harbor and Terminal District, Meyer and Associates, Inc. have prepared plans for additional roadway improvements to the existing access roads located along the south property line of the site. Provided herewith is a site plan and typical sections of the proposed roadway improvements.

Roadway improvements will consist of two phases.

Phase I improvements (parallel to existing Navy limestone access road) will generally consist of earthwork necessary to provide a suitable alignment and grade within acceptable design standards, placement of geotextile fabric, stone base course and PCC pavement. Ditches and culverts along the roadway will be constructed to provide required roadway drainage.

Phase II improvements (parallel to existing unsurfaced access road) will generally consist of a minimal grading and leveling, placement of geotextile fabric, and placement of limestone surface course. Ditches and culverts will be constructed to provide required roadway drainage.

March 13, 1992 4-10113/4-10123 (#63) Meyer and Associates, Inc.

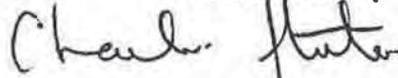
U. S. Army, Corps of Engineers
March 13, 1992
Page Two

Any excess materials will be deposited and spread along the existing perimeter levee slopes.

Please advise our office of you determination at your earliest opportunity. If you have any questions, please advise.

Yours very truly,

MEYER AND ASSOCIATES, INC.



Charles W. Stutes, P. E.

CWS:tb

cc: Mr. John Polansky, Jr.

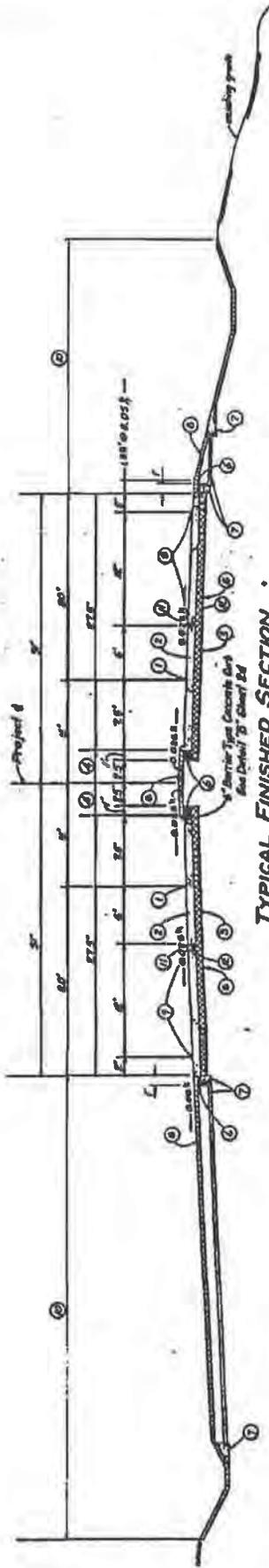


March 13, 1992 4-10113/4-10123 (#63) Meyer and Associates, Inc.



		LALE CHARLES HARBOR & TERREMINA DISTRICT CALCASIEU PARISH, LOUISIANA		INDUSTRIAL CANAL SOUTH SHORE GENERAL SITE PLAN SITE ROADWAYS		CAPITAL DEVELOPMENT PLAN		DATE: MARCH 2014 PROJECT NO: 14-001	
PROJECT NO: 14-001 SHEET NO: 12		SCALE: 1" = 100' DATE: MARCH 2014		DRAWN BY: [Name] CHECKED BY: [Name]		APPROVED BY: [Name]		PROJECT NO: 14-001 SHEET NO: 12	

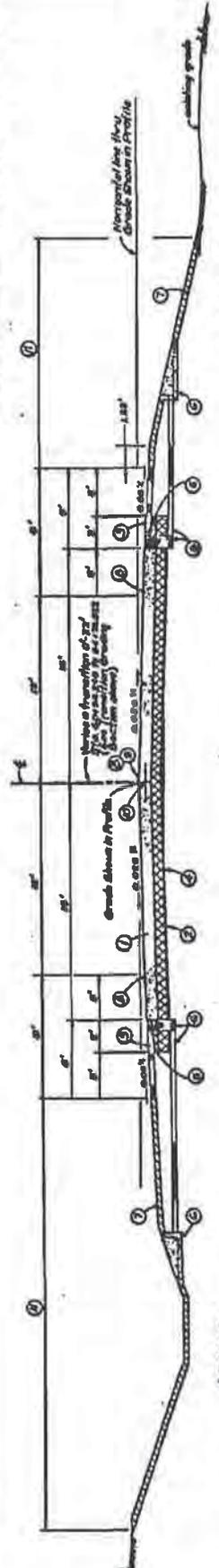
FOR INFORMATIONAL PURPOSES ONLY



TYPICAL FINISHED SECTION
 STA. 64+75.622 to STA. 71+84.900

LEGEND

- ① Portland Cement Concrete Pavement (8" Thick)
- ② Base Course (5 1/2") (3 1/2" Thick)
- ③ Aggregate Surface Course (5 1/2") (4" Thick) (Net Section)
- ④ Geotextile Fabric
- ⑤ Embankment (2000 Cu. Yds. per Lin. Ft. inside, 0.000 Cu. Yds. per Lin. Ft. outside, One side net section)
- ⑥ Underdrain System and Outlets
- ⑦ Top Soil (2" Thick)
- ⑧ Plastic Pavement Striping (6" Width)
- ⑨ Limits of Seeding, Fertilizer, Water, and Excavator Marking
- ⑩ Reflectored Raised Pavement Markers (Class II)
- ⑪ Longitudinal Construction Joint or Longitudinal Joint



TYPICAL FINISHED SECTION
 STA. 60+81.401 to STA. 64+75.622

LEGEND

- ① Portland Cement Concrete Pavement (8" Thick)
- ② Base Course (5 1/2") (3 1/2" Thick)
- ③ Aggregate Surface Course (5 1/2") (4" Thick) (Net Section)
- ④ Geotextile Fabric
- ⑤ Embankment (2000 Cu. Yds. per Lin. Ft. inside, 0.000 Cu. Yds. per Lin. Ft. outside, One side net section)
- ⑥ Underdrain System
- ⑦ Top Soil (2" Thick)
- ⑧ Plastic Pavement Striping (6" Width)
- ⑨ Reflectored Raised Pavement Markers (Class II)
- ⑩ Longitudinal Construction Joint or Longitudinal Joint
- ⑪ Limits of Seeding, Fertilizer, Water, and Excavator Marking

NOTE: Contractor shall provide a plan showing a detailed layout of all points, and this plan shall be approved by the Project Engineer prior to any field construction.

The Meyer Group
 1000 West 10th Street, Suite 200, Lincoln, NE 68502
 (402) 441-1000

DESIGNED: _____
 DRAWN: _____
 CHECKED: _____
 APPROVED: _____

PHASE I

REVISIONS

NO.	DATE	DESCRIPTION

PROJECT NO. _____ DATE _____

SCALE: **NTS.**

PROJECT NO. _____ DATE _____



DEPARTMENT OF THE ARMY

NEW ORLEANS DISTRICT, CORPS OF ENGINEERS

P.O. BOX 60267

NEW ORLEANS, LOUISIANA 70160-0267

91-011

REPLY TO
ATTENTION OF:

January 27, 1991

Operations & Readiness Division
Surveillance & Enforcement Section

Mr. John Polansky, Jr.
Lake Charles Harbor & Terminal District
Post Office Box AAA
Lake Charles, Louisiana 70602-0AAA

Dear Mr. Polansky:

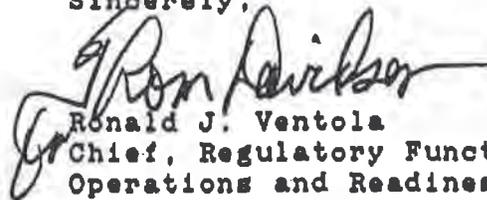
This is in regard to your letter of January 21, 1992, concerning your proposed project for access improvements at the Industrial Canal South Shore which you identify as Project No. 91-011. We understand the project to involve minor grading of the existing containment levees to remove ruts and other surface irregularities, the placement of geotextile fabric, and the placement and compaction of crushed limestone. Culverts will be placed to provide adequate drainage at various locations.

Based on a review of the information you have provided, we have determined that this work does not involve depositing fill in a wetland as you have designed it, therefore, it will not require a permit from the U.S. Army Corps of Engineers.

This determination is only applicable to the permit program administered by the Corps of Engineers. It does not eliminate the need to obtain other Federal, state or local approvals before beginning the work.

Should you have any questions regarding this matter, please contact Dr. Thom Davidson at (504) 862-2270.

Sincerely,


Ronald J. Ventola
Chief, Regulatory Functions Branch
Operations and Readiness Division



②

January 21, 1992

U. S. Army Corps of Engineers
P. O. Box 60267
New Orleans, LA 70160-0267

Attention: Mr. Ronald J. Ventola
Chief, Regulatory Functions Branch
Operations & Readiness Division

Re: Access Improvements at the
Industrial Canal South Shore
Project No. 91-011
Perimeter Access Road - ICSS

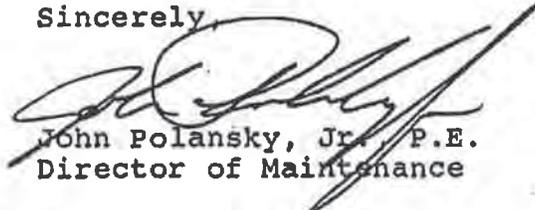
Gentlemen:

This letter is to advise you of planned access improvements at the ICSS and to request approval of the work described herein and on the attached drawing. The work includes minor grading of the existing containment levees to remove ruts and other surface irregularities; placement of geotextile fabric; and placement and compaction of crushed limestone. Culverts will also be placed to provide drainage at various locations.

Earth work will be confined to the perimeter of the site and does not include placement of any fill material other than surfacing aggregate. Any excavated materials will be deposited and spread along the existing levee slopes.

Please advise this office of your determination at your earliest opportunity.

Sincerely,



John Polansky, Jr. P.E.
Director of Maintenance

JP:hd

Attachment



Lake Charles
Harbor
& Terminal
District

Post Office Box AAA
Lake Charles, LA 70602
Phone 318-439-3661
Telex 502449 Portlkchas
Facsimile 318-493-3523

Exhibit C

Form of Letter of Credit

Date: [INSERT DATE]

IRREVOCABLE STANDBY LETTER OF CREDIT NUMBER: [INSERT LETTER OF CREDIT NUMBER]

BENEFICIARY [LAKE CHARLES HARBOR AND TERMINAL District] [ADDRESS]	APPLICANT [CAMMERON LNG, LLC] [ADDRESS]
	AMOUNT USD \$[AMOUNT IN NUMBERS] [AMOUNT IN WORDS] US Dollars
	EXPIRATION DATE: [INSERT DATE] at our counter

We, [NAME OF ISSUING BANK], hereby establish our Irrevocable Standby Letter of Credit No. [INSERT LETTER OF CREDIT NUMBER] (this "Letter of Credit") for account of [NAME OF APPLICANT] in favor of LAKE CHARLES HARBOR AND TERMINAL District (the "Beneficiary") for an aggregate amount of USD [AMOUNT IN NUMBER AND WORDS] (THE "L/C Amount").

The L/C Amount is available for one or more drawings under this Letter of Credit by presentation by the Beneficiary to us of a demand for a payment under this Letter of Credit in the form of the Schedule I to this Letter of Credit (a "Demand").

Each Demand under this Letter of Credit is presentable at our office at:

[]
Attn: []

Subject to the terms of this Letter of Credit, we unconditionally and irrevocably undertake to the Beneficiary that, within ten (10) calendar days of receipt by us of a Demand, we shall pay to the Beneficiary the amount demanded in that Demand, provided that we shall not be obliged to make a payment under this Letter of Credit if as a result the aggregate of all payments made by us under this Letter of Credit would exceed the L/C Amount. Payment of a Demand under this Letter of Credit will be made by wire transfer of immediately federal funds to such account as Beneficiary may designate in the Demand. As used in this Letter of Credit the term "Business Day" means a day other than a Saturday, Sunday or any other day on which banking institutions in the state of [New York] are authorized or required by law to close.

Upon our receipt of a reduction notice (a “Reduction Notice”) in the form of Schedule II to this Letter of Credit, the L/C Amount shall be permanently reduced by the amount stated in such Reduction Notice.

All bank charges, including, but not limited to, fees or commissions shall be for the account of Applicant.

We hereby undertake that we will not modify, revoke or terminate this Letter of Credit without the Beneficiary’s written consent.

We will be released from our obligations under this Letter of Credit on the date (if any) notified by the Beneficiary to us as the date upon which our obligations under this Letter of Credit are released. Unless previously released under the immediately preceding sentence, on [INSERT DATE] [a.m/p.m.] [INSERT TIME ZONE] on [INSERT EXPIRATION DATE], our obligations under this Letter of Credit will cease with no further liability on our part except for any Demand validly presented under the Letter of Credit that remains unpaid; provided, however, that this Letter of Credit shall be deemed to have been automatically extended without amendment for an additional twelve (12) month period from such expiration date, and, thereafter, annually, from the then current expiration date unless we have notified the Beneficiary in writing at least sixty (60) calendar days prior to the then current expiration date that this Letter of Credit will not be extended; provided further that, in the event of an act of God, riot, civil commotion, insurrection, war or any other causes beyond our control that interrupts our business (collectively a “Force Majeure Event”) and causes the place for presentation of Demands under this Letter of Credit to be closed for business on the then current expiration date of this Letter of Credit, then such expiration date of this Letter of Credit will be automatically extended without amendment to the thirtieth calendar day after the date on which the place for presentation reopens for business.

This Letter of Credit shall be surrendered to us promptly after its expiration.

This Letter of Credit shall be governed by, and construed in accordance with, the terms of the Uniform Customs and Practice for Documentary Credits (2007 Revision), International Chamber of Commerce Publication No. 600 (the “Uniform Customs”), except to the extent that the terms hereof are inconsistent with the Uniform Customs. As to matters not governed by the Uniform Customs, this Letter of Credit shall be governed by and construed in accordance with the laws of the State of New York, including, without limitation, the Uniform Commercial Code as in effect in the State of New York. This Letter of Credit sets forth in full the terms of our undertaking, and such undertaking shall not be modified, annulled or amplified by reference to any other document, instrument or agreement referred to herein or to which the Letter of Credit relates, and such reference shall not be deemed to incorporate herein by reference any document, instrument or agreement, except for the Uniform Customs.

Communications with respect to this Letter of Credit shall be in writing and shall be addressed to us at [ADDRESS], specifically referring to the number of this Letter of Credit.

Authorized Signature

Authorized Signature

SCHEDULE I (FORM OF L/C DEMAND) TO LETTER OF CREDIT

To: [ISSUING BANK]

Date: [Date]

Dear Sirs,

We refer to your IRREVOCABLE STANDBY LETTER OF CREDIT NUMBER [INSERT LETTER OF CREDIT NUMBER] (the "Letter of Credit"). Terms used in herein have the meaning as defined in the Letter of Credit. This is a Demand under the Letter of Credit.

1. Pursuant to the Letter of Credit, demand is hereby made for payment of the sum of [INSERT IN WORDS] ([INSERT IN NUMBERS]).

2. Payment should be made to the following account:

[INSERT ACCOUNT INFORMATION]

3. The date of this Demand is not later than the expiration date of the Letter of Credit.

Yours faithfully,

[]

(Authorized Signatory)

For

[BENEFICIARY]

SCHEDULE II (FORM OF REDUCTION NOTICE) TO LETTER OF CREDIT

To: [ISSUING BANK]

Date: [Date]

Dear Sirs,

We refer to your IRREVOCABLE STANDBY LETTER OF CREDIT NUMBER [INSERT LETTER OF CREDIT NUMBER] (the "Letter of Credit"). Terms used in herein have the meaning as defined in the Letter of Credit. This is a Reduction Notice under the Letter of Credit.

With effect from the date of this Reduction Notice, the L/C Amount is reduced by [INSERT WORDS] ([INSERT NUMBERS]).

Yours faithfully,

[]

(Authorized Signatory)

For

[BENEFICIARY]

[]

(Authorized Signatory)

For

[APPLICANT]

Exhibit D

Required Amount

<u>Contract Year</u>	<u>Required Amount</u>
Any Contract Year ending on or before May 31, 2019	\$22,500,000
Any Contract Year commencing on or after June 1, 2019 and ending on or before May 31, 2024	\$18,750,000
Any Contract Year commencing on or after June 1, 2024 and ending on or before May 31, 2029	\$15,000,000
Any Contract Year commencing on or after June 1, 2029	\$11,250,000

EXHIBIT 1

Legal Description of Project Site

PROJECT SITE DESCRIPTION

(Morrison Survey is verifying total acres. District is fine with leasing maximum available acres. The east property line of area leased to BG and DII needs to be determined, verified and checked. This may be causing the difference between 90 acres and over 100 acres.)

EXHIBIT 2

Form of [Option Notice] or [Exercise of Right to Extend Option]

[Date]

Lake Charles Harbor & Terminal District
751 Bayou Pines East, Suite P
Lake Charles, LA 70601
Attention: President

Re: [Exercise of Option] [Extension of Option]

Dear Ladies and Gentlemen:

Reference is made to that certain Real Estate Lease Option Agreement dated as of _____, 2013 (the "Option Agreement") by and between Magnolia LNG, LLC, a Delaware limited liability company ("PROJECT COMPANY"), and the Lake Charles Harbor & Terminal District, a political subdivision of the State of Louisiana, (the "DISTRICT"). All capitalized terms used in this letter shall have the meanings ascribed thereto in the Option Agreement.

This letter shall serve as written notice by PROJECT COMPANY to the DISTRICT under the Option Agreement of PROJECT COMPANY's intention to [exercise its Option under the Option Agreement to enter into the Ground Lease for the Project Site] [extend the Option Agreement for the _____ Extended Option Period].

No further action is required by the DISTRICT in order for PROJECT COMPANY's [exercise of its Option] [extend the Option Agreement for the _____ Extended Option Period] to be effective and upon delivery of this letter to the DISTRICT, PROJECT COMPANY shall be deemed to have [exercised its Option under the Option Agreement] [extended the Option Agreement for the _____ Extended Option Period].

Very truly yours,
Magnolia LNG, LLC

By: _____
Its duly authorized signatory

cc: Executive Director
 Lake Charles Harbor & Terminal District
 751 Bayou Pines East, Suite P
 Lake Charles, LA 70601

Michael K. Dees
Lake Charles Harbor & Terminal District
751 Bayou Pines East, Suite P
Lake Charles, LA 70601

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Appendix 1.C.2

BG LNG Option Agreement

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REAL ESTATE LEASE OPTION AGREEMENT

BE IT KNOWN, that on the dates hereinafter set forth, before the undersigned Notaries Public, duly commissioned and qualified in and for their respective State and County/Parish, and in the presence of the undersigned competent witnesses personally came and appeared:

MAGNOLIA LNG, LLC ("MAGNOLIA"), a Delaware limited liability company with its principal business office located at 5 Ord Street, West Perth, Western Australia 6005, and with its registered office in Louisiana at 5615 Corporate Blvd, Suite 400B, Baton Rouge, LA 70808, herein represented by its duly authorized undersigned representative; and

BG LNG SERVICES, LLC ("BG"), a Delaware limited liability company, herein represented by its duly authorized representative, with its principal business office located in Harris County, Texas, 811 Main Street, Suite 3400, Houston, Texas 77002

which hereinafter collectively declare that:

WITNESSETH:

WHEREAS, the Lake Charles Harbor & Terminal District ("District") is a deep water port and political subdivision of the State of Louisiana ("State") exercising governmental powers of the State as delegated and authorized pursuant to the Louisiana Constitution and other statutory supplemental authorities, acting by and through the Executive Director of the District, having its office and domicile at 751 Bayou Pines East, Suite P, Lake Charles, Louisiana;

WHEREAS, pursuant to (i) that certain Ground Lease Agreement dated as of September 1, 1998, by and between PIM, L.L.C. (predecessor-in-interest to Trunkline LNG Company, LLC, a Delaware limited liability company ("Trunkline")) and District, recorded at Conveyance Book 2720, page 479, file number 2426040, official records of Calcasieu Parish, Louisiana, (together with all of its material assignments of and amendments and extensions, "1998 PIM Lease") and (ii) that certain Ground Lease Agreement dated as of January 25, 2005 by and between Trunkline and District, a memorandum of which is recorded at Conveyance Book 3562, page 240, file

number 2909147, official records of Calcasieu Parish, Louisiana (together with any of its material amendments and extensions, "2005 Trunkline Lease") (the 1998 PIM Lease and the 2005 Trunkline Lease shall together or collectively be referred to as the "Trunkline Lease Agreements"), Trunkline leased land owned by District for the use and occupancy of District for the purposes stated in the Trunkline Lease Agreements including the construction, maintenance, and operation of docks, wharves, and bulkheads, the layberthing of liquefied natural gas ocean-going motor vessels, together with other support vessels and associated vessel support operations, and the handling and movement of cargoes, and related activity;

WHEREAS, pursuant to Ground Sublease Agreement dated May 30, 2006 (the "BG Ground Sublease") by and between Trunkline and BG, Trunkline subleased Tracts 1 and 2 (containing 31.73 acres) included in the 2005 Trunkline Lease and Parcels I and II and Tract 2 (containing 40.38 acres) included in the 1998 PIM Lease to BG;

WHEREAS, Trunkline and District entered into an Amended and Restated Composite Lease (Turning Basin Properties) dated effective May 30, 2006, recorded at Conveyance Book 3905, page 229, file number 3114189, aforesaid records, which amended and restated in their entirety the 1998 PIM Lease as amended and assigned and the 2005 Trunkline Lease as amended and assigned (the "Restated Trunkline Lease");

WHEREAS, BG and Trunkline entered into a Restated and Amended Sublease (Turning Basin Properties) dated effective June 9, 2010, recorded at Conveyance Book 3905, page 196, file number 3114188, aforesaid records (the "BG Restated Sublease") which amended and restated the BG Ground Sublease in its entirety;

WHEREAS, MAGNOLIA has determined that a portion of BG subleased land under the BG Restated Sublease is needed for and essential to the construction, operation and maintenance of a liquefied natural gas processing and export facility (the "Facility") to be constructed and operated by MAGNOLIA; such portion of BG subleased lands (the "Magnolia Site") being described on Exhibit 1 attached hereto and comprising of approximately 7.73 acres more or less;

WHEREAS, in an effort to accommodate the District's objective of promoting the economic development and creation of jobs in the greater Lake Charles area while expressly

reserving all of BG's rights to monitor, comment and object to the Project (as defined below) during the regulatory and permitting process, BG has agreed to enter into this Real Estate Lease Option Agreement (this "Option Agreement") to give MAGNOLIA the opportunity to assess the Magnolia Site for purposes of locating, constructing, operating and maintaining the Facility or portions thereof, and any other facilities related to the operations of MAGNOLIA as described above (collectively, the "Project"); and

WHEREAS, the District and Trunkline consent to this Real Estate Lease Option Agreement (the "Option Agreement") and the sublease transaction contemplated hereby, pursuant to their intervention below.

NOW, THEREFORE, in consideration of the above recitals and the mutual covenants hereinafter contained, the parties herein covenant and agree as follows:

AGREEMENT

1. **PARTIES**. This Option Agreement is between BG and MAGNOLIA on the terms and conditions hereinafter set forth, to-wit:

2. **IRREVOCABLE AND EXCLUSIVE OPTION TO LEASE**.

A. **Initial Option Period**. For and in consideration of an option payment in the amount of \$6,025.00 (the "Initial Option Payment") and the mutual covenants hereinafter contained, BG does hereby grant unto MAGNOLIA, or its assignee, an irrevocable and exclusive option (the "Option") to sublease the Magnolia Site, on the terms and conditions set forth in the attached and annexed Sublease marked as Annex A (the "Magnolia Sublease"). This Option is hereby granted to MAGNOLIA for a period of twelve (12) months from the Effective Date (as defined in Paragraph 21) (the "Initial Option Period"). The Initial Option Payment shall be payable to BG not later than fifteen (15) calendar days after the Effective Date of this Option Agreement.

B. **First Extended Option Period**. The Initial Option Period shall be subject to an extension for up to twelve (12) months (the "First Extended Option Period") for any reason that MAGNOLIA deems necessary in its sole discretion. The right to extend the Initial Option Period

for the First Extended Option Period may be exercised by MAGNOLIA in its sole discretion in accordance with Paragraph 5 below. If MAGNOLIA exercises its right to extend the Initial Option Period, then MAGNOLIA will make a payment to BG in the amount of \$7,530.00 for the First Extended Option Period (the “First Additional Option Payment”) not later than fifteen (15) calendar days after exercising such right in accordance with Paragraph 5 below.

C. Second Extended Option Period. The First Extended Option Period shall be subject to an extension for up to twelve (12) months (the “Second Extended Option Period”), for any reason that MAGNOLIA deems necessary in its sole discretion. The right to extend the First Extended Option Period for the Second Extended Option Period may be exercised by MAGNOLIA in its sole discretion in accordance with Paragraph 5 below. If MAGNOLIA exercises its right to extend the First Extended Option Period, then MAGNOLIA will make a payment to BG in the amount of \$12,050.00 Dollars for the Second Extended Option Period (the “Second Additional Option Payment”), not later than fifteen (15) calendar days after exercising such right in accordance with Paragraph 5 below.

D. Third Extended Option Period. The Second Extended Option Period shall be subject to an extension for up to twelve (12) months (the “Third Extended Option Period”), for any reason that MAGNOLIA deems necessary in its sole discretion. The right to extend the Second Extended Option Period for the Third Extended Option Period may be exercised by MAGNOLIA in its sole discretion in accordance with Paragraph 5 below. If MAGNOLIA exercises its right to extend the Second Extended Option Period, then MAGNOLIA will make a payment to BG in the amount of \$18,075.00 Dollars for the Third Extended Option Period (the “Third Additional Option Payment”), not later than fifteen (15) calendar days after exercising such right in accordance with Paragraph 5 below. However, if MAGNOLIA properly exercises this Option to Lease the Magnolia Site, then, in that event, BG shall grant a credit to MAGNOLIA of the Initial Option Payment toward any rent due under the Magnolia Sublease.

E. Option Exercise. In order to exercise its Option to sublease the Magnolia Site, MAGNOLIA shall give written notice to BG of its intention to sublease the Magnolia Site in accordance with the provisions of Paragraph 5. If MAGNOLIA fails to timely exercise its Option during the Initial Option Period, the First Extended Option Period, the Second Extended Option

Period, or Third Extended Option Period, as applicable, no further payments shall be due by MAGNOLIA and this Option Agreement shall be terminated and be of no further force or effect. If MAGNOLIA, after meeting all required conditions, timely exercises its Option, during the Initial Option Period or, if applicable, during the First Extended Option Period, the Second Extended Option Period or Third Extended Option Period, the parties shall execute and deliver the Magnolia Sublease on or before the Closing Date (as defined in Paragraph 8.D herein). Except as provided for in Paragraph, 2.D, any Option Payments made by MAGNOLIA under the Option Agreement shall not be deemed or considered rent, rental, or any other consideration under the Magnolia Sublease or used as a credit against any rent or other consideration due under the Magnolia Sublease.

F. Cancellation of Option by MAGNOLIA. Notwithstanding anything to the contrary in this Option Agreement, MAGNOLIA shall have the right at any time during the Initial Option Period or, if applicable, during the First Extended Option Period, the Second Extended Option Period or Third Extended Option Period, to cancel the Option at any time without any additional liability to BG upon delivery of written notice to BG of MAGNOLIA's desire to cancel the Option. Upon such cancellation of the Option by MAGNOLIA at any time, the Initial Option Payment and, if applicable, the First Additional Option Payment, the Second Additional Option Payment and the Third Additional Option Payment (collectively, the "Option Payments"), shall be non-refundable to MAGNOLIA, but no other payments shall be due by MAGNOLIA and this Option Agreement shall be terminated and be of no further force and effect.

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4. RENT CREDIT. MAGNOLIA shall not be entitled to any credit for the Option Payments against rent due under the Magnolia Sublease, except as set forth in Paragraph 2D.

5. EXERCISE OF OPTION/EXTENDED OPTION PERIOD. The Option to sublease the Magnolia Site, or the right to extend the Initial Option Period, the First Extended Option Period or the Second Extended Option Period as set forth above, must be exercised in each case, if at all, by delivery of a written notice from MAGNOLIA to BG in substantially the form of Exhibit 2 with the appropriate blanks completed on or before the expiration of the Initial Option

Period or the First Extended Option Period, Second Extended Option Period or Third Extended Option Period, as applicable. Failure to timely exercise the Option or the right to extend the Initial Option Period, First Extended Option Period or Second Extended Option Period shall automatically terminate the right of MAGNOLIA to exercise the Option or to extend the Initial Option Period or First Extended Option Period, as applicable.

6. CONSIDERATION FOR THE LEASE OF MAGNOLIA SITE. If MAGNOLIA meets all required conditions and timely exercises its Option to sublease the Magnolia Site, BG shall comply with all terms and conditions of this Option Agreement as hereinafter set forth to sublease the Magnolia Site to MAGNOLIA on the Closing Date for the consideration as stated in the Magnolia Sublease and in accordance with the provisions of this Option Agreement and the Magnolia Sublease.

7. MAGNOLIA'S RIGHTS AND BG'S OBLIGATIONS DURING THE OPTION PERIOD.

A. Access and Inspection; Early Works. At all times during this Option Agreement, MAGNOLIA shall, at its cost, and upon providing at least twenty-four hours prior notice to BG (which may be telephonic notice), have reasonable access to the Magnolia Site for the purpose of determining the suitability of the Magnolia Site and performing any and all other inspections, analyses, tests and other due diligence that MAGNOLIA deems necessary or desirable in its sole discretion, including, without limitation, (i) developing preliminary engineering, design and construction information relative to the facilities required to comprise and support the Project, (ii) performing site assessments of the Magnolia Site by a contractor or contractors, including, without limitation, Phase I and Phase II environmental site assessments and any other environmental assessments that MAGNOLIA or any governmental entity regulating the Project deems necessary, (iii) performing engineering design, geotechnical, geophysical, seismic, archaeological and land surveys and assessments of and around the Magnolia Site, (iv) performing tests and inspections of improvements, structures, wells, septic tanks, underground storage tanks, soils, geologic hazards, utility lines and systems located on or under, the Magnolia Site, (v) conducting soil borings upon the Magnolia Site, for purposes of analyzing such soils, (vi) interviewing persons familiar with the Magnolia Site, (vii) coordinating design activities

with District; (viii) performing a land survey and title review, and (ix) any other actions or activities deemed by MAGNOLIA in its sole discretion to be necessary or desirable for MAGNOLIA to inspect, assess and establish the suitability of the Magnolia Site or assess compliance with this Option Agreement (collectively, the “Magnolia Site Activities”). Further, MAGNOLIA may have additional rights to undertake certain activities on the Magnolia Site subject and in accordance with an “Early Works Agreement” which may be negotiated and agreed upon in the future between MAGNOLIA and BG. MAGNOLIA and its employees, agents, representatives, contractors and consultants shall have access to the Magnolia Site, upon providing at least twenty-four (24) hours notice to BG (which may be telephonic notice), during the Initial Option Period and the First Extended Option Period, the Second Extended Option Period or Third Extended Option Period, as applicable, unless and until the date on which MAGNOLIA shall have entered into the Magnolia Sublease, or the expiration or termination of this Option Agreement. After the full execution of the Magnolia Sublease, MAGNOLIA shall have access to the Magnolia Site pursuant to the terms of the Magnolia Sublease.

B. Compliance with Laws; No Environmental Liability. MAGNOLIA shall take reasonable measures to ensure that its employees, agents, representatives, contractors and consultants, in conducting any Magnolia Site Activities, comply with all applicable laws, rules, regulations, ordinances and decrees of any governmental body, and the reasonable health and safety procedures currently in effect and otherwise implemented by BG from time to time for all the BG subleased lands. BG acknowledges and agrees that MAGNOLIA shall not incur any liability for any hazardous materials and/or substances, including, but not limited to, natural occurring radioactive material (“NORM”), asbestos, and polychlorinated biphenyls (“PCB”), existing on the Magnolia Site, as of the Commencement Date (as defined in the Magnolia Sublease) and shall not incur any liability for discovery of such hazardous materials and/or substances.

C. Delivery of Copies of Reports by MAGNOLIA. Excluding any materials owned by third parties, proprietary information of MAGNOLIA, materials subject to obligations of confidentiality or other restrictions or materials that cannot easily be separated from materials pertaining to property other than the Magnolia Site, all reports, plans, maps, surveys, soil studies, soil reports, or such other similar information pertaining solely to the physical condition of the

Magnolia Site developed by MAGNOLIA or its employees, agents, representatives, contractors and/or consultants pursuant to the Magnolia Site Activities prior to the Closing Date or, if the Option is not exercised, prior to the expiration of this Option Agreement (“Data”) shall be provided to BG at no cost within thirty (30) calendar days following the Closing Date or, if the Option is not exercised, within thirty (30) calendar days following the expiration of this Option Agreement. BG acknowledges and agrees that MAGNOLIA owns all such Data, subject to BG’s right to utilize such Data for any purpose without further consents or approval of MAGNOLIA.

D. Delivery of Diligence Materials by BG. No later than thirty (30) calendar days after the Effective Date, BG shall provide to MAGNOLIA, at BG’s expense and to the extent that BG currently has possession of same: (i) copies of any and all title insurance policies, title abstracts, title commitments, title exception documents and vesting deeds solely for the Magnolia Site; (ii) copies of any surveys, environmental assessments, audits, test results or reports, wetland mitigation documentation, engineering studies or surveys and soil conditions reports or studies, within BG’s possession or access or that of its attorneys, consultants, contractors and/or engineers solely related to the Magnolia Site; (iii) copies of any and all Governmental Approvals (as defined in Paragraph 7.E herein) that apply to or that BG has obtained solely for the Magnolia Site; (iv) copies of all contracts, leases, agreements, security agreements, servitudes, liens and obligations currently in effect relating to the Magnolia Site; (v) copies of any documents relating to pending litigation, written threats of litigation, legal violations, zoning changes or development moratoriums, and (vi) copies of any other information BG may have in its possession or control regarding the Magnolia Site (collectively, “Magnolia Site Materials”). The parties acknowledge and agree that BG’s obligation to provide the Magnolia Site Materials is on-going during this Option Agreement, to the extent that any such information becomes available to or is created by or for BG following the Effective Date.

E. Governmental Approvals. The execution and delivery of this Option Agreement and, if applicable, the Magnolia Sublease, shall not affect or diminish any rights that BG has or may have to monitor, comment and/or object to the Project during the Governmental Approvals (as defined hereinafter) process or at any other time during the term of this Option Agreement or the Magnolia Sublease, which reserved rights also include Trunkline’s right to monitor, comment and/or object for purposes of this Section 7E (collectively, the “BG Reserved Rights”); provided,

however that neither BG nor Trunkline shall derive any rights whatsoever with respect to Governmental Approvals for the Facility by reason of this Option Agreement or the Magnolia Sublease. BG shall assist MAGNOLIA, at no additional costs or expense to BG, with such matters as reasonably requested by MAGNOLIA in writing in connection with MAGNOLIA's efforts to complete and obtain: (i) all regulatory permits and approvals (including, without limitation, the issuance of any FERC permits, special use permits, building permits, zoning matters, environmental permits, and any other permits, approvals or ordinances deemed necessary or desirable by MAGNOLIA in its reasonable discretion in order to construct, develop and operate the Project on the Magnolia Site ("Governmental Approvals"), and (ii) results from the Magnolia Site Activities. MAGNOLIA agrees to diligently pursue obtaining all Governmental Approvals and satisfying all requirements in connection therewith. Subject at all times to the BG Reserved Rights, BG agrees that MAGNOLIA shall have the authority to apply for all Governmental Approvals. No Governmental Approvals shall be binding on BG or create any obligations to be fulfilled by BG unless BG specifically consents to be bound by such obligations in writing. MAGNOLIA further acknowledges and agrees that any reasonable exercise of the BG Reserved Rights at any time shall not constitute a default or other breach under this Option Agreement or the Magnolia Sublease (including, but not limited to Section 20.1 thereof), nor shall the reasonable exercise of any BG Reserved Rights at any time be grounds for MAGNOLIA to seek return of any portion of the Option Payments or other payments/expenses incurred or due by MAGNOLIA hereunder or pursuant to the Magnolia Sublease.

F. Operation of Magnolia Site During Option Period. After the Effective Date, BG and its employees, contractors and agents (i) shall maintain the Magnolia Site in the same condition as it was on the Effective Date, reasonable wear and tear excepted, and otherwise operate and maintain the Magnolia Site in the same manner as before the Effective Date, (ii) except in the case of an emergency, or to avert a potential emergency, shall not take any action and shall not permit any third party to take any action that would unreasonably interfere with MAGNOLIA'S lawful Magnolia Site Activities, (iii) shall not take any action and shall not cause any third party to take any action that would materially alter or affect the condition of the Magnolia Site, including, but not limited to, by causing a casualty or introducing, releasing, storing or exacerbating any hazardous waste or hazardous substances, including, but not limited

to, NORM, asbestos, and PCBs, upon, around or under any portion of the Magnolia Site or into the ground water beneath or adjacent to the Magnolia Site , and (iv) shall comply with any notices of legal violations or court orders affecting the Magnolia Site. If BG becomes aware prior to the Closing Date of any introduction, release, storage or exacerbation of any hazardous waste or hazardous substances, including, but not limited to, NORM, asbestos, and PCBs, upon, around or under any portion of the Magnolia Site or into the ground water beneath or adjacent to the Magnolia Site, then BG shall notify MAGNOLIA in writing the earlier of (a) within fifteen (15) calendar days after BG becomes aware of the same or (b) prior to the Closing Date. If BG violates this Paragraph 7.F, then BG shall take all reasonable actions to cure or remedy such violation at its sole cost and expense. If BG is unable to cure or remedy such violation by the Closing Date, then MAGNOLIA shall have the option in its sole discretion (to be exercised in a written notice delivered to BG) to: (a) grant BG additional time within which to cure the violation, and in such event the Closing (as defined in Paragraph 8.D herein) shall be extended for such time necessary to cure the violation (in which case MAGNOLIA and BG shall continue to have all of the rights and obligations set forth in this Option Agreement until the Closing); (b) elect not to enter into the Magnolia Sublease, whereupon BG shall immediately refund the aggregate Option Payments paid to BG and BG shall be liable to MAGNOLIA for MAGNOLIA's actual third party costs and expenses incurred in the due diligence and/or development of the Magnolia Site, drafting and negotiating of this Option Agreement and the Magnolia Sublease, and preparation of the Closing of the transaction contemplated by this Option Agreement (including, without limitation, all costs and expenses incurred in connection with the Magnolia Site Activities); or (c) waive such violation and proceed to Closing as provided in Paragraph 8.D below.

8. ADDITIONAL RIGHTS AND OBLIGATIONS PENDING EXERCISE OF LEASE OPTION. During the Initial Option Period, First Extended Option Period, Second Extended Option Period and Third Extended Option Period, as applicable, BG and MAGNOLIA hereby agree as follows:

A. Verification of Title and Survey.

(i) MAGNOLIA, at MAGNOLIA's expense, may obtain a title insurance commitment ("Title Commitment") to be issued by a title insurance company acceptable to MAGNOLIA in its sole discretion ("Title Company"), pursuant to which the Title Company shall commit to issue a 2006 ALTA extended coverage leasehold title insurance policy to MAGNOLIA ("Leasehold Title Policy") and a 2006 ALTA leasehold title loan insurance policy to any lender(s) of MAGNOLIA ("Lender Title Policy", and collectively with the Leasehold Title Policy, the "Title Policies"), each in forms and insurable amounts reasonably acceptable to MAGNOLIA and with such endorsements as MAGNOLIA may reasonably request. The Title Commitment shall show BG to be vested with good, marketable and complete leasehold interest pursuant to the BG Restated Sublease, subject to Trunkline's and the District's rights under the BG Restated Sublease and Restated Trunkline Lease, respectively, concerning the Magnolia Site and further subject only to the following matters (the "Permitted Exceptions"): ad valorem real estate taxes, if any are owed, for the current year and subsequent years, not yet due and payable; all applicable zoning ordinances and regulations; and such other matters as shall be satisfactory to MAGNOLIA, in MAGNOLIA's sole discretion.

(ii) MAGNOLIA may obtain, at MAGNOLIA's expense, a current staked ALTA/ACSM survey of the Magnolia Site, complying with the most current Minimum Standard Detail Requirements for ALTA/ACSM Surveys and including any Table A items that MAGNOLIA may request in its sole discretion ("Survey"), prepared by a surveyor or engineer licensed in Louisiana with a certificate attached thereto executed by the surveyor in the form of the most current Minimum Standard Detail Requirements certificate for ALTA/ACSM surveys. The Survey shall reflect the boundaries of the Magnolia Site and all improvements, servitudes, highways, pipeline, utility and other rights-of-way, flood zone classifications and other matters affecting or abutting the Magnolia Site, and shall be in a form sufficient to induce the Title Company to delete all standard and printed exceptions contained in the Title Commitment with regard to survey matters.

(iii) MAGNOLIA shall have until sixty (60) calendar days prior to Closing (the "Title Review Period") to notify BG of any title defects, encumbrances, servitudes, use

restrictions or other matters noted in the Title Commitment, the Survey, or elsewhere that MAGNOLIA requires to be removed or corrected prior to the execution and issuance of the Magnolia Sublease (“Title Objections”).

(iv) The Title Commitment will show that all standard exceptions will be deleted from the Leasehold Title Policy (and from the Lender Title Policy, if MAGNOLIA has requested one), when issued, and that the “gap” will be deleted as of the Closing Date. If, within the Title Review Period, MAGNOLIA notifies BG of any Title Objections, BG shall use its diligent, good faith, commercially reasonable efforts to cure (or cause the District and Trunkline to cure) and eliminate the Title Objections (unless caused directly or indirectly by MAGNOLIA) at the District’s expense (unless same are caused directly by BG or Trunkline in which case the costs shall be borne by BG or Trunkline as applicable). MAGNOLIA shall have the right to make additional requirements or objections as to title, up until the Closing Date, in the event any title or survey update or endorsement to the Title Commitment discloses matters not shown in the Title Commitment or Survey (“Additional Title Objections” and together with the initial Title Objections, the “Title Objections”). As long as this Option Agreement remains in effect, BG shall not convey all or any interest in the Magnolia Site to any third party (an “Unauthorized Transfer”) and, without MAGNOLIA’s prior written consent in its sole discretion, BG shall not grant or amend any lease, license, permit to use, servitude, lien, security interest or other encumbrance on the Magnolia Site (an “Unauthorized Encumbrance”). If BG is unable to cure the Title Objections, Unauthorized Transfer or Unauthorized Encumbrance by the Closing Date, MAGNOLIA shall have the option in its sole discretion (to be exercised in a written notice delivered to BG) to: (a) grant BG additional time within which to cure (or cause the cure of) the Title Objections, Unauthorized Transfer or Unauthorized Encumbrance, and in such event the Closing shall be extended for such time necessary to cure the Title Objections, Unauthorized Transfer or Unauthorized Encumbrance (in which case MAGNOLIA and BG shall continue to have all of the rights and obligations set forth in this Option Agreement until the Closing); (b) elect not to enter into the Magnolia Sublease, whereupon BG shall immediately refund the aggregate Option Payments paid to BG and the parties will be relieved from further liability hereunder, unless BG defaulted in its obligations under this Option Agreement (including, but not limited to, causing and failing to cure an Unauthorized Transfer or Unauthorized Encumbrance if BG is the sole cause of same) or acted in a commercially unreasonable manner

in not causing the District to cure such Title Objections or those Title Objections arising directly from BG's acts, in which event BG shall be liable to MAGNOLIA for MAGNOLIA's actual third party costs and expenses incurred in the due diligence and/or development of the Magnolia Site; drafting and negotiating of this Option Agreement and preparation of the Closing of the transaction contemplated by this Option Agreement (including, without limitation, all costs and expenses incurred in connection with the Magnolia Site Activities); or (c) waive one or more of the Title Objections, Unauthorized Transfers or Unauthorized Encumbrances (at which point such Title Objections, Unauthorized Transfer or Unauthorized Encumbrances will become Permitted Exceptions) and proceed to the Closing, as provided in Paragraph 8.D below.

(v) For purposes of clarification, if the Survey reflects encroachments, non-contiguity, overlaps, strips, gaps, rights-of-way or other encumbrances or interests on or in the Magnolia Site, or any other survey matters, or if the Magnolia Site, consists of two or more parcels which are not contiguous along the entire length of their common boundary, such defects may also be raised as a Title Objection as described in Paragraph 8.A (iv) above.

B. BG's Representations. BG warrants, covenants and represents, during the term of this Option Agreement, the following to MAGNOLIA with full knowledge that MAGNOLIA is relying upon same in agreeing to enter into this Option Agreement:

(i) BG subleases the Magnolia Site. BG has the full power and authority to make, deliver, enter into and perform pursuant to the terms and conditions of this Option Agreement and to consummate the transactions described in this Option Agreement and the Magnolia Sublease, and has taken all necessary action and proceedings to authorize the execution, delivery and performance of the terms and conditions of this Option Agreement and the Magnolia Sublease. No further consent of any person or entity is required in connection with the execution and delivery of, or performance by BG of its obligations under this Option Agreement and the Magnolia Sublease, except for the consent of the District and Trunkline which consent is given in the Intervention section of this Option Agreement.

(ii) This Option Agreement and the documents to be executed and delivered by BG in connection with the consummation of this Option Agreement are (and when the Option

is exercised and the Closing has occurred, the Magnolia Sublease will be) valid, binding and enforceable in accordance with their respective terms and conditions.

(iii) The execution, delivery and performance by BG of this Option Agreement and the Magnolia Sublease are not precluded by, and will not violate, any provisions of any existing law, statute, rule or regulation in Louisiana or any judgment, order, decree, writ or injunction of any court, governmental department, commission, board, bureau or agency, and will not result in a breach of, or default under, any agreement, mortgage, contract, undertaking or other instrument or document to which BG is a party or by which BG is bound or to which BG or any portion of the Magnolia Site is subject.

(iv) No portion of the Magnolia Site is presently being or, as of the Effective Date, previously has been acquired by any governmental authority in the exercise of its power to condemn or to acquire through eminent domain or private purchase in lieu thereof nor are any of these proceedings or actions threatened, pending or imminent.

(v) There are no actions, suits or proceedings pending or to BG's Knowledge (as defined in Paragraph 8.B(xii)), threatened against, by or affecting BG in any court or before any government agency regarding the Magnolia Site, including, but not limited to, any such actions, suits or proceedings relating to the ownership of, or BG's ability to sublease the Magnolia Site or that would affect the value or use or development of the Magnolia Site or the obligations of BG to enter into and perform its obligations under this Option Agreement or the Magnolia Sublease.

(vi) All work, labor, service and materials furnished prior to the Closing Date solely to or solely in connection with the Magnolia Site and any improvements constructed on the Magnolia Site prior to the Closing Date, will be discharged by BG prior to the Closing Date, so that no mechanics', materialmen's or other lien, except those created by MAGNOLIA, its affiliates or contractors, may be filed against the Magnolia Site or such improvements. BG shall indemnify, defend and hold MAGNOLIA harmless from and against any liens affecting the Magnolia Site solely created by BG and (a) relate to work, labor, services, or materials furnished prior to the Closing Date and (b) are not filed or perfected until after the Closing Date.

(vii) To BG's Knowledge there are no parties other than BG in possession of any portion of the Magnolia Site, as lessees, tenants at sufferance, licensees, or trespassers, and no person or entity has any right or option to lease, purchase, occupy or possess all or any part of the Magnolia Site, except for the District and Trunkline in accordance with the BG Restated Sublease and Restated Trunkline Lease and the District's condemnation authority or general police power.

(viii) BG has not entered into any agreement, commitments or arrangements concerning the Magnolia Site, or development thereof with any persons, including, but not limited to, governmental entities or agencies, councils, boards or other entities, adjoining landowners, utility companies or agencies other than MAGNOLIA.

(ix) The Magnolia Site is not subject to assessment or collection of additional taxes for prior years based upon a change of land usage or ownership.

(x) To BG's Knowledge, BG has not manufactured, stored, released or located any hazardous waste or hazardous substances, including, but not limited to, NORM, asbestos, and PCBs, upon, around or under any portion of the Magnolia Site or into any ground water beneath or adjacent to the Magnolia Site and BG has received no warning notice, violation notice, complaint (judicial or administrative) or any other formal or informal notice alleging that the Magnolia Site is not in compliance with any statute, ordinance, rule or regulation pertaining to hazardous waste or substances, including, but not limited to, NORM, asbestos, and PCBs. Except as disclosed by any reports provided to MAGNOLIA pursuant to Paragraph 7.D of this Option Agreement, to BG's Knowledge (a) no hazardous waste or hazardous substances, including, but not limited to, NORM, asbestos, or PCBs, have been manufactured, stored, released or located upon or under any portion of the Magnolia Site or into any ground water beneath or adjacent to the Magnolia Site, (b) the Magnolia Site has never been used to treat, store, release or dispose of waste materials or hazardous substances, including, but not limited to, NORM, asbestos, or PCBs; (c) there has not been and is no leaching or drainage of waste materials or hazardous substances, including, but not limited to, NORM, asbestos, or PCBs, into the ground water beneath or adjacent to the Magnolia Site; and (d) there have not been and are

not buried or semi-buried or otherwise placed tanks, storage vessels, drums or containers of any kind located on the Magnolia Site.

(xi) BG has received no notice from any governmental authority concerning the imposition or widening of any streets, roads or highways abutting the Magnolia Site or widening of the shipping channel alongside the Magnolia Site, or concerning the imposition of any special taxes or assessments against the Magnolia Site. BG has no knowledge of general plan, specific plan, zoning or other land use regulation proceedings or special assessment proceedings pending or threatened, with respect to the Magnolia Site. BG is not a party to any covenant or agreement to preserve or prevent a change in the existing zoning, land use designations, special use permits or entitlements of the Magnolia Site.

(xii) Other than as set forth in this Option Agreement, BG has not (a) entered into any agreement relating to the Magnolia Site, nor (b) encumbered or granted any interest in the Magnolia Site.

Each of the foregoing warranties, covenants and representations shall still be true and correct as of the Effective Date (except where specifically noted) and the Closing Date, shall survive the Closing Date and shall not be merged with or into the Magnolia Sublease or any other related instrument of conveyance or transfer. The term "Knowledge" as used in this Paragraph 8.B shall mean what BG knows or should reasonably know about the Magnolia Site, and any other matters addressed by the warranties, covenants, and representations made herein.

C. MAGNOLIA's Representations. MAGNOLIA warrants, covenants and represents, during the term of this Option Agreement, the following to BG, with full knowledge that BG is relying upon same in agreeing to enter into this Option Agreement:

(i) MAGNOLIA has the full power and authority to make, deliver, enter into and perform its obligations pursuant to the terms and conditions of this Option Agreement and has taken all necessary action and proceedings to authorize the execution, delivery and performance of the terms and conditions of this Option Agreement. No further consent of any person or entity is required in connection with the execution and delivery of, or performance by the MAGNOLIA of its obligations under this Option Agreement.

(ii) The execution, delivery and performance by MAGNOLIA of this Option Agreement are not precluded by, and will not violate, any provisions of any existing law, statute, rule or regulation in Louisiana or any judgment, order, decree, writ or injunction of any court, governmental department, commission, board, bureau or agency, and will not result in a breach of, or default under, any agreement, mortgage, contract, undertaking or other instrument or document to which MAGNOLIA is a party or by which MAGNOLIA is bound or to which MAGNOLIA is subject.

(iii) There are no actions, suits or proceedings pending or to MAGNOLIA's Knowledge (as defined in Paragraph 8.C(iv)), threatened against, by or affecting the MAGNOLIA in any court or before any government agency regarding the Magnolia Site, including, but not limited to, any such actions, suits or proceedings relating to the ownership of, or MAGNOLIA's ability to lease the Magnolia Site or that would materially affect the contemplated use or development of the Magnolia Site or the obligations of MAGNOLIA to perform its obligations under this Option Agreement.

(iv) All work, labor, service and materials furnished to MAGNOLIA prior to the Closing Date to or in connection with the Magnolia Site, will be discharged by MAGNOLIA prior to the Closing Date (unless the Option is exercised and the Magnolia Sublease is entered into by the parties in which case such matters will be MAGNOLIA's responsibility pursuant to the terms of the Magnolia Sublease), so that no mechanics', materialmen's or other lien, created by MAGNOLIA, its affiliates or contractors, may be filed against the Magnolia Site or such improvements. MAGNOLIA shall indemnify, defend and hold BG harmless from and against any liens affecting the Magnolia Site that were not created by BG and (a) relate to work, labor, services, or materials furnished prior to the Closing Date at the request or direction of the MAGNOLIA and (b) are not filed or perfected until after the Closing Date.

(v) MAGNOLIA, in conducting the activities permitted under this Option Agreement and the Magnolia Sublease and MAGNOLIA's other business operations, shall take such reasonable steps as are necessary not to interfere with or otherwise disrupt (a) BG's use of other property which BG leases from the District or Trunkline; (b) BG's business and operations

on or near the Magnolia Site or the Calcasieu Ship Channel; or (c) BG's sublessee's of property adjacent or in the vicinity of the Magnolia Site.

Each of the foregoing warranties, covenants and representations shall still be true and correct as of the Effective Date (except where specifically noted) and the Closing Date, shall survive the Closing Date and shall not be merged with or into the Magnolia Sublease or any other related instrument of conveyance or transfer. The term "Knowledge" as used in this Paragraph 8.0 shall mean what MAGNOLIA knows or should reasonably know about the matters addressed by the warranties, covenants and representations made herein.

D. Closing. The execution of the Magnolia Sublease (the "Closing") shall take place as soon as practical following the MAGNOLIA's exercise of the Option as provided in Paragraph 5 above, but in no event shall the Closing take place later than fifteen (15) calendar days following such exercise, as may be extended by the extensions provided for in Paragraphs 7.F, 8.A and 8.G ("Closing Date"). Possession of the Magnolia Site shall be delivered to MAGNOLIA or its assignee as of the Closing Date, free and clear of the rights and claims of any other party other than Permitted Exceptions; provided, however, that prior to the Closing Date, MAGNOLIA and its employees, agents, representatives, contractors and consultants shall have the right to enter upon the Magnolia Site at any and all times for purposes of any further inspections of the Magnolia Site as provided in Paragraph 7 above, upon providing at least twenty-four (24) hour prior notice to BG (which may be telephonic notice).

E. Expenses of Closing. At Closing, District shall pay the costs of recording any documents or certificates or taking any other action required to be taken to correct title defects or remove any title encumbrances (including, without limitation, any Title Objections, Additional Title Objections, Unauthorized Transfers or Unauthorized Encumbrances), unless such encumbrances are caused by BG in which case BG shall pay such costs. At Closing, MAGNOLIA shall pay the costs of recording an extract or memorandum of the Magnolia Sublease (as provided in the Magnolia Sublease) and for the Leasehold Title Policy (and the Lender Title Policy, if MAGNOLIA has requested one) issued pursuant to the Title Commitment. MAGNOLIA and BG shall each pay the fees and expenses of their respective counsel incurred in connection with the negotiation, preparation and execution of this Option

Agreement and the Magnolia Sublease, and satisfying its respective obligations under this Option Agreement. MAGNOLIA and BG shall each pay any brokerage, finder's fee or similar commission in connection with the option or lease of the Magnolia Site arising from its actions. MAGNOLIA shall pay the cost of the Survey and the Leasehold Title Policy (and the Lender Title Policy, if MAGNOLIA has requested one).

F. Closing Documents.

(i) BG shall deliver the following at Closing:

(a) Fully executed and signed Magnolia Sublease in substantially the form attached hereto as Annex A.

(b) Gap, mechanic's lien and possession affidavit(s) in forms sufficient to cause the Title Company to issue the Leasehold Title Policy (and the Lender Title Policy, if MAGNOLIA has requested one), without the applicable standard title policy exceptions.

(c) a certified copy of a resolution of the members or managers of BG (as required by the operating agreement of BG), authorizing the execution of the Magnolia Sublease, and all other documents necessary to effect the valid execution of the Magnolia Sublease.

(d) Possession of the Magnolia Site.

(ii) At Closing, MAGNOLIA shall:

(a) Deliver a certified copy of a resolution of the members or managers of MAGNOLIA (as required by the operating agreement of MAGNOLIA), authorizing the execution of the Magnolia Sublease, and all other documents necessary to effect the valid execution of the Magnolia Sublease.

(b) Cause the execution and delivery of the Magnolia Sublease by a duly authorized officer of MAGNOLIA.

G. Conditions Precedent for MAGNOLIA to Close. The following are conditions precedent to MAGNOLIA's obligations at Closing, including execution of the Magnolia Sublease:

(i) As of the Closing Date, all of BG's representations and warranties contained in Paragraph 8.B hereof shall be true and correct.

(ii) BG shall have performed all of its obligations under this Option Agreement.

(iii) BG's interest in the Magnolia Site shall be (and BG hereby warrants and represents to MAGNOLIA that the same is) good, merchantable, marketable and free and clear of any liens, encumbrances, highways, rights-of-way, servitudes, licenses, restrictions, leases, agreements, covenants, conditions and limitations, except the Permitted Exceptions. BG's title shall also be total and complete and not subject to any outstanding or contingent liens or claims of an undivided interest therein and MAGNOLIA shall have received the Survey and an irrevocable written commitment of the Title Company to issue the Leasehold Title Policy (and the Lender Title Policy, if MAGNOLIA has requested one), each in form and substance reasonably acceptable to MAGNOLIA.

(iv) There are no pending, threatened or existing moratoriums or governmental regulations, statutes, proceedings or actions pending, threatened or existing against BG, the Project or the Magnolia Site before any court or governmental agency or authority that would prohibit or inhibit MAGNOLIA from obtaining utility service, building permits or development approvals, or which would prevent, prohibit, delay or inhibit the construction, development and operation of the Project on the Magnolia Site.

(v) Subsequent final geotechnical investigation does not necessitate any substantial revision to the type of structural design contemplated by the preliminary investigation conducted by or on behalf of MAGNOLIA.

(vi) MAGNOLIA shall have obtained Final Approval (as hereinafter defined) with respect to all Governmental Approvals, free of any unreasonable or extraordinary conditions imposed by the issuing entity upon the issuance of such Final Approvals (provided

that MAGNOLIA has used its commercially reasonable efforts to pursue in good faith the necessary Final Approvals). “Final Approval” shall be the date when: (a) all of the Governmental Approvals have been approved and issued, in forms and with conditions satisfactory to MAGNOLIA; (b) the time has passed for appeal of all Governmental Approvals; and (c) any appeals or litigation with respect to clause (b) above have been prosecuted and fully and finally resolved in a manner satisfactory to MAGNOLIA. If MAGNOLIA exercises the Option but fails to execute the Magnolia Sublease through no fault of BG, in addition to forfeiting the aggregate Option Payments paid, MAGNOLIA shall be liable to BG for BG’s actual third party costs and expenses incurred in preparation of the Closing as contemplated by this Option Agreement.

(vii) There shall have been no material change in the condition of the Magnolia Site from the condition in which the Magnolia Site existed as of the date that MAGNOLIA exercised the Option without MAGNOLIA’s prior written consent.

(viii) BG shall not be in default of any other existing agreement with MAGNOLIA (“Existing Agreements”), after notice and beyond any applicable cure period.

In the event that after MAGNOLIA’s exercise of the Option, any of the conditions precedent to MAGNOLIA’s obligation to sublease the Magnolia Site are not satisfied as of the Closing Date or not waived by MAGNOLIA or it is reasonably determined prior to the Closing Date that such conditions cannot be fulfilled or satisfied and the same are not waived by MAGNOLIA, then, at the sole option of MAGNOLIA (to be exercised in MAGNOLIA’s sole discretion by delivery of written notice to BG): (i) MAGNOLIA may elect not to enter into the Magnolia Sublease and this Option Agreement shall be terminated and all parties shall be relieved of any further obligations hereunder; whereupon BG shall not be obligated to refund any of the Option Payments, except to the extent that the failure to fulfill or satisfy a condition results from BG’s default under this Option Agreement with respect to its obligations described herein, in which case BG shall be obligated to return the aggregate Option Payments paid by MAGNOLIA and shall be liable for MAGNOLIA’s actual third party costs and expenses incurred in the due diligence and/or development of the Magnolia Site, drafting and negotiating of this Option Agreement and the Magnolia Sublease, and preparation of the Closing of the transaction contemplated by this Option Agreement (including, without limitation, all costs and

expenses incurred in connection with the Magnolia Site Activities), or (ii) MAGNOLIA may, at its option and at no cost to MAGNOLIA, extend up to three hundred sixty-five (365) days the Closing or for such period as is reasonably necessary to satisfy all of the conditions precedent to MAGNOLIA's obligation to proceed with the Closing.

H. Conditions Precedent for BG to Close. The following are conditions precedent to BG's obligations at Closing, including execution of the Magnolia Sublease:

(i) As of the Closing Date, all of MAGNOLIA's representations and warranties contained in Paragraph 8.0 hereof shall be true and correct in all material respects.

(ii) MAGNOLIA shall not be in default of any other Existing Agreement with BG, after notice and beyond any applicable cure period.

(iii) MAGNOLIA shall have performed all of its obligations under this Option Agreement.

In the event that after MAGNOLIA's exercise of the Option, any of the conditions to BG's obligation to sublease the Magnolia Site are not satisfied as of the Closing Date or not waived by BG, and the non-fulfillment or satisfaction of such conditions was not caused by BG, in whole or in part, or it is reasonably determined prior to the Closing Date that such conditions cannot be fulfilled or satisfied and the same are not waived by BG, then, at the sole option of BG (to be exercised in BG's sole discretion by delivery of written notice to MAGNOLIA): (i) BG may elect not to enter into the Magnolia Sublease and this Option Agreement shall be terminated and all parties shall be relieved of any further obligations hereunder; whereupon BG shall not be obligated to refund any of the Option Payments. To the extent that the failure of such condition results from MAGNOLIA's default under this Option Agreement with respect to its obligations described herein, or any material obligation under any Existing Agreement with respect to its obligations described therein, MAGNOLIA shall be liable for BG's actual third party costs and expenses in drafting and negotiating of this Option Agreement and the Magnolia Sublease, and preparation of the Closing of the transaction contemplated by this Option Agreement, or (ii) BG may, with MAGNOLIA'S written consent, extend up to three hundred sixty-five (365) days the Closing or for such period as is reasonably necessary to satisfy all of the conditions precedent to

BG's obligation to proceed with Closing, in exchange for which MAGNOLIA shall pay BG Twelve Thousand Forty-Eight Thousand and NO/100 (\$12,048.00) Dollars, prorated for the period of such extension.

I. Mutual Indemnification. MAGNOLIA agrees to indemnify, defend and hold BG and BG's officers and directors harmless from and against any and all claims, actions, damages, liabilities and expenses (including, without limitation, reasonable attorneys' fees and expenses) resulting from any occurrence on the Magnolia Site during the term of this Option Agreement and arising from any act or omission of MAGNOLIA or MAGNOLIA's employees, agents, representatives, contractors or consultants, except to the extent that any of the same arise from or out of the negligence or willful misconduct of BG or BG's employees, agents, representatives, contractors or consultants. BG agrees to indemnify, defend and hold MAGNOLIA and MAGNOLIA's officers, directors, managers, and members harmless from and against any and all claims, actions, damages, liabilities and expenses (including, without limitation, reasonable attorneys' fees and expenses) resulting from any occurrence on the Magnolia Site during the term of this Option Agreement and arising from any act or omission of BG or BG's employees, agents, representatives, contractors or consultants, except to the extent that any of the same arise from or out of the negligence or willful misconduct of MAGNOLIA or MAGNOLIA's employees, agents, representatives, contractors or consultants.

9. Intentionally left blank.

10. SUCCESSORS AND ASSIGNS. This Option Agreement shall be binding upon and shall inure to the benefit of the parties hereto and their respective successors and lawful assigns. However, this Option Agreement may not be assigned or transferred by MAGNOLIA to any other person or entity without the consent of BG, which consent shall not be unreasonably withheld, delayed or conditioned; provided that if MAGNOLIA is not in default after notice and beyond any applicable cure period under this Option Agreement or any material obligation under an Existing Agreement, MAGNOLIA may assign this Option Agreement in its entirety without BG's prior consent to (i) an Affiliate or (ii) a successor in interest in connection with a merger, acquisition or sale of all or substantially all of MAGNOLIA's assets or membership interests of MAGNOLIA, (iii) as collateral in connection with a financing, or (iv) any person to whom

MAGNOLIA is permitted to assign the Option Agreement. "Affiliate" shall mean an entity that controls, is controlled by or is under common control with MAGNOLIA, where "control" means the ownership directly or indirectly of more than fifty percent (50%) of the voting rights in a company or other legal entity or the ability to directly or indirectly appoint a majority of the directors in a company or other legal entity.

11. NOTICES. All notices required or allowed by this Option Agreement shall be delivered by email (with a requirement that such electronic notice shall be followed within three (3) calendar days by written notice delivered in one of other manners permitted in this paragraph), third party overnight courier (including overnight courier services such as Federal Express) or by certified mail, return receipt requested, postage prepaid, addressed to the party to whom notice is to be given, at the following addresses:

If to MAGNOLIA:

Magnolia LNG, LLC
616 Broad Street
P.O. Box 3759 (70602)
Lake Charles, LA 70601
Attention: Company Secretary
Email: dgardner@lnglimited.com.au

with a copy to:

Winfield E. Little, Jr.
616 Broad Street
P.O. Box 3759 (70602)
Lake Charles, LA 70601
Email: wlittle@littlelawfirm.com

and

Chad Mills
Sutherland Asbill & Brennan LLP
1001 Fannin Street, Suite 3700
Houston, TX 77002-6760
Email: chad.mills@sutherland.com

If to BG:

BG LNG Services, LLC
811 Main Street, Suite 3400
Houston, TX 77002
Attention: Marc Hopkins or Marine Operations
Email: mark.hopkins@bg-group.com
shipping.operations@bg-group.com

Notice shall be deemed to have been given upon receipt by recipient (provided that any notice by email shall have been followed within three (3) calendar days by written notice delivered in one of the other manners permitted under this paragraph), by the overnight courier airbill or by the return receipt. In the event that the recipient fails or refuses to sign the return receipt for delivery by certified mail, the receipt shall be sufficient.

12. DEFAULT. In the event of a default by BG with respect to any of its obligations hereunder, including the satisfaction of all conditions precedent or any breach or misrepresentation by BG of any warranties, representations and covenants made by BG in Paragraph 8.B, MAGNOLIA shall, except as otherwise provided for herein, be entitled to the right of specific performance against BG together with the recovery of all expenses incurred in obtaining specific performance, including reasonable attorney's fees and all costs of court or, at MAGNOLIA's sole election, MAGNOLIA shall be entitled to terminate this Option Agreement and BG shall immediately return all Option Payments previously paid by MAGNOLIA as liquidated damages and shall be liable for MAGNOLIA's actual third party costs and expenses incurred in the due diligence and/or development of the Magnolia Site, drafting and negotiating of this Option Agreement and the Magnolia Sublease, and preparation of the Closing of the transaction contemplated by this Agreement (including, without limitation, all costs and expenses incurred in connection with the Magnolia Site Activities) and MAGNOLIA may exercise any other rights or remedies available at law or in equity. For the avoidance of doubt, this is in addition to any rights for the return of the Option Payments that the MAGNOLIA may have under this Option Agreement. In the event of a default by Magnolia with respect to any of its obligations hereunder, including the satisfaction of all conditions precedent or any breach or misrepresentation by MAGNOLIA of any terms, provisions, warranties, representations and covenants of MAGNOLIA, BG shall, except as otherwise provided for herein, be entitled to the right of specific performance against MAGNOLIA together with the recovery of all expenses incurred in obtaining specific performance, including reasonable attorney's fees and all costs of court or, at BG's sole election, BG shall be liable for BG's actual third party costs and expenses incurred in drafting and negotiating this Option Agreement and the Magnolia Sublease, and preparation of the Closing of the transaction contemplated by this Agreement and BG may exercise any other rights or remedies available at law or in equity. For the avoidance of doubt,

this is in addition to retaining all Option Payments that MAGNOLIA may have paid under this Option Agreement.

13. EMINENT DOMAIN/CASUALTY. If, during the term of this Option Agreement, there is any taking of any portion of the Magnolia Site by eminent domain or condemnation, then BG shall promptly deliver written notice thereto of the MAGNOLIA, and if MAGNOLIA determines that such taking will materially affect the Magnolia Site for the development, construction, maintenance or operation of the Project, in MAGNOLIA's reasonable determination, MAGNOLIA may, at its option (to be exercised in MAGNOLIA's sole discretion by delivery of written notice to BG), terminate this Option Agreement or elect to not enter into the Magnolia Sublease (if MAGNOLIA has already exercised the Option), whereupon BG shall immediately refund the aggregate Option Payments paid to BG and the parties will be relieved from further liability hereunder. In the event that the Magnolia Site is rendered, at any time during the term of this Option Agreement or prior to the Closing, in MAGNOLIA's sole determination, permanently unsuitable for the development, construction, maintenance or operation of the Project as a result of a casualty event (including any hurricane, named storm, flood or tornado) or Force Majeure (as hereinafter defined) event occurring in and around Calcasieu Parish, Louisiana, then MAGNOLIA may, at its option (to be exercised in MAGNOLIA's sole discretion by delivery of written notice to BG), terminate this Option Agreement or elect to not enter into the Magnolia Sublease (if MAGNOLIA has already exercised the Option), whereupon BG shall immediately refund the aggregate Option Payments paid to BG and the parties will be relieved from further liability hereunder.

14. ENTIRE AGREEMENT. This Option Agreement constitutes the entire agreement of the parties with respect to subject matter hereof. All understandings and agreements heretofore between the parties hereto with respect to the subject matter hereof are merged in this Option Agreement which alone fully and completely expresses their understanding.

15. ATTORNEY'S FEES. In connection with any litigation concerning this Option Agreement, the prevailing party shall be entitled to recover all of its costs, expenses and reasonable attorney's fees from the non-prevailing party.

16. **NO WAIVER.** No waiver of any provision of this Option Agreement shall be effective unless it is in writing and signed by the party against whom it is asserted; and any such written waiver shall only be applicable to the specific instance to which it relates and shall not be deemed to be a continuing or future waiver.

17. **AMENDMENTS.** This Option Agreement may not be amended, modified, altered or changed in any respect whatsoever except by further agreement in writing and duly executed by the parties hereto.

18. **GOVERNING LAW.** This Option Agreement shall be governed in its enforcement, construction and interpretation by the laws of the State of Louisiana. In the event that either party must file suit as a result of a default on the part of the other, such suit shall be filed in a state court of competent jurisdiction in the Fourteenth Judicial District Court, State of Louisiana, unless the default of dispute implicates or involves a federal statute, regulation, order, or permit, in which case venue shall be in the federal courts for the Western District of Louisiana.

19. **COUNTERPARTS; HEADINGS; TIME OF THE ESSENCE.** This Option Agreement may be executed in counterparts by the parties hereto and each of which shall be deemed an original but all of which taken together shall constitute but one and the same instrument. The paragraph captions and headings contained in this Option Agreement are included herein for convenience of reference only and shall not be considered a part hereof and are not in any way intended to define, limit or enlarge the terms hereof. Time shall be of the essence for each and every provision of this Option Agreement of which time is an element.

20. **RECORDING.** This Option Agreement shall not be recorded in the public records, provided, however, that BG shall execute, acknowledge and deliver to MAGNOLIA a memorandum of this Option Agreement in recordable form prepared by MAGNOLIA, which may be recorded by MAGNOLIA in the conveyance records of Calcasieu Parish, Louisiana.

21. **EFFECTIVE DATE.** The effective date of this Option Agreement (“Effective Date”) shall be the last date that BG or MAGNOLIA executes this Option Agreement.

22. **REAL ESTATE COMMISSION.** BG and MAGNOLIA each represent to the other party that they have dealt with no brokers in connection with the negotiation, execution and/or

delivery of this Option Agreement or the Magnolia Sublease, and no party is entitled to any broker's commission, finder's fee or similar payment with respect to this Option Agreement or the Magnolia Sublease arising from the representing party's actions. If any other person shall assert a claim to a finder's fee, brokerage commission or other compensation on account of alleged employment as finder or broker in connection with this transaction, the party against whom the purported finder or broker is claiming shall indemnify, defend and hold the other party harmless from and against any such claim and any and all costs, expenses and liabilities incurred in connection with such claim or any action or proceeding brought thereon, including, but not limited to, reasonable attorney's fees and court costs in defending such claim.

23. FORCE MAJEURE. Notwithstanding any other provision of this Option Agreement, provided that notice is given within thirty (30) calendar days of an occurrence of an event of Force Majeure (as hereinafter defined) by the party hereto seeking to invoke and utilize the provisions of this Paragraph 23, such party shall be excused from performing any of its respective obligations or undertakings required hereunder for so long as the performance of such obligations are prevented or significantly delayed, retarded or hindered by any event of Force Majeure, provide that an event of Force Majeure shall not excuse any party from making any payment of money required under this Option Agreement. As used in this Paragraph, "Force Majeure" means any cause not reasonably within the control of the party claiming suspension, and shall include, but not be limited to, the following: (i) physical events such as acts of God, landslides, lightning, earthquakes, fires, storms, hurricanes, droughts, floods, washouts, or explosions, (ii) weather related events affecting an entire geographic region; (iii) acts of others such as strikes, lockouts or other industrial disturbances, riots, sabotage, terrorism, insurrections, civil disturbance or wars; provided that the settlement of strikes, lockouts or other industrial disturbances shall be within the sole discretion of the party claiming such suspension; (iv) the failure or interruption of performance by MAGNOLIA's engineering, procurement and construction contractors or any subcontractors of such contractor to the extent caused by an event of Force Majeure; or (v) the failure or interruption of performance by MAGNOLIA's suppliers by reason of such supplier's valid declaration of an event that would constitute an event of force majeure under MAGNOLIA's contract with such supplier; or (vi) governmental actions such as necessity for compliance with any court order, law, statute, ordinance, regulation or policy having the effect of law promulgated by a governmental authority having jurisdiction, or that

restrict MAGNOLIA's ability to construct the Project or any delay in issuance or effectiveness of any Governmental Approval that has been properly applied for by MAGNOLIA that is required to construct the Project.

INTERVENTION BY DISTRICT AND TRUNKLINE

And now into these premises comes LAKE CHARLES HARBOR & TERMINAL DISTRICT ("District") and TRUNKLINE LNG COMPANY, LLC ("Trunkline") which intervene for the purpose of and do hereby consent to the entering into this Option Agreement and the Magnolia Sublease among BG and MAGNOLIA, and which further consent and agree to the following:

A. District and Trunkline consent to this Option Agreement and the Magnolia Sublease and to the Project use proposed for the Magnolia Site. Where approval or consent of District or Trunkline is required by the BG Restated Lease or Restated Trunkline Lease (including, for the avoidance of doubt, for uses beyond the Project use), District and Trunkline agree not to unreasonably withhold, delay or condition such approval or consent.

B. MAGNOLIA agrees that it will not sublease the Magnolia Site without the approval of District, which approval District agrees shall not be unreasonably withheld, delayed or conditioned.

C. District agrees to waive the provision set forth in Section C of the District's Intervention contained in the BG Restated Sublease with respect to the Option Agreement and Magnolia Sublease and any other equivalent provision contained in the documents ancillary to the BG Restated Sublease.

D. District and Trunkline each acknowledge and agree that the Restated Trunkline Lease and BG Restated Lease are or will be in full force and effect on or prior to the exercise of the Option by MAGNOLIA.

E. Upon the occurrence of any event that would give District or Trunkline the right to terminate the BG Restated Lease and/or the Restated Trunkline Lease, or in the event that Trunkline or the District fail to timely exercise any renewal options thereunder, District and/or

Trunkline, as applicable, agree to send written notice to MAGNOLIA describing the circumstances giving rise to such right to terminate and what would need to be done by Trunkline to prevent such termination or that the renewal option(s) have not been timely exercised by BG or Trunkline, whichever the case may be (an "Impending Termination Notice"). If the event giving rise to District's and/or Trunkline's right to terminate concerns Trunkline's or BG's failure to pay any undisputed monies due, MAGNOLIA shall have ten (10) days from receipt of the Impending Termination Notice to prevent termination by making payment on Trunkline's or BG's behalf, whichever the case may be. If the event giving rise to District's or Trunkline's right to terminate is something other than Trunkline's or BG's failure to pay an undisputed amount and MAGNOLIA informs District and/or Trunkline within ten (10) days of receipt of the Impending Termination Notice that it plans to use reasonable efforts to cure or remedy such event, then District and/or Trunkline shall suspend its termination right until sixty (60) days after the date that MAGNOLIA receives the Impending Termination Notice, at which time District and/or Trunkline may exercise its right to terminate if the event giving rise to the Impending Termination Notice has not been cured or remedied. If the event giving rise to District's and/or Trunkline's right to terminate concerns Trunkline's or BG's failure to timely exercise its renewal option under the applicable BG Restated Sublease or Trunkline Restated Lease, the District and/or Trunkline, shall provide the Impending Termination Notice to MAGNOLIA not later than three (3) business days after the date to exercise such renewal option(s) expired and MAGNOLIA shall have thirty (30) days from receipt of such Impending Termination Notice to elect to exercise the applicable renewal option under the applicable lease(s), but only with respect to the Magnolia Site and the District and/or Trunkline shall accept such exercise from MAGNOLIA and enter into such further agreements or documents as MAGNOLIA deems necessary to evidence such exercise of the renewal option with respect to the Magnolia Site.

F. In the event that the BG Restated Lease and/or the Restated Trunkline Lease is rejected, disaffirmed or terminated pursuant to bankruptcy law or other law affecting creditors' rights, then MAGNOLIA shall have the right, exercisable by notice to the District or Trunkline, as the case may be, within thirty (30) days after the effective date of such rejection, disaffirmation or termination, to enter into a new sublease of the Magnolia Site directly with Trunkline or a new direct lease directly with the District, as the case may be. The term of such

new lease or sublease shall begin on the date of the termination of the BG Restated Lease or the Restated Trunkline Lease, as applicable, and shall continue for the remainder of the term thereof (including the right to exercise all extension options thereunder). Such new lease or sublease shall otherwise contain the same terms and conditions as those set forth in the lease or sublease being replaced, except for requirements that are no longer applicable or have already been performed. This provision shall survive any such termination and shall continue in full force and effect thereafter to the same extent as if this provision were a separate and independent contract among MAGNOLIA, Trunkline and the District.

[Signatures on Following Pages]

THUS DONE AND SIGNED by BG LNG SERVICES, LLC at Houston, Texas, in the presence of the undersigned competent witnesses and me, Notary, on this 6th day of SEPT, 2013.

WITNESSES:

BG LNG SERVICES, LLC

Mary C. Ogden
Print Name: Mary C. Ogden

By: Michael R. Mott
Name: MICHAEL R. MOTT
Title: VICE PRESIDENT

Angela Conde
Print Name: Angela Conde

BEFORE ME: BEATRIZ OYANEDEL

Notary Public

My Commission expires: AUG 6, 2017



THUS DONE AND SIGNED by MAGNOLIA LNG, LLC at Houston, Texas, in the presence of the undersigned competent witnesses and me, Notary, on this 28th day of August, 2013.

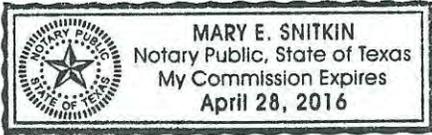
WITNESSES:

MAGNOLIA LNG, LLC

AL LINDER
Print Name: AL LINDER

By: [Signature]
Name: Fletcher Maurice Brand
Title: Managing Director

Gia Vandewer
Print Name: Gia Vandewer



BEFORE ME: _____

Notary Public Mary E Snitkin

My Commission expires: Apr 28, 2016

THUS DONE AND SIGNED by the Lake Charles Harbor & Terminal District as intervenor in the Option Agreement, at Lake Charles, Louisiana in the presence of the undersigned competent witnesses and me, Notary, on this 26th, day of September, 2013.

WITNESSES:

LAKE CHARLES HARBOR &
TERMINAL DISTRICT



Print Name: Louis Colletta

By: 

Name: William J. Rose III

Title: Executive Director



Print Name: Donald Brukman

BEFORE ME: 

Notary Public

My Commission expires: _____



MICHAEL K. DEES
LOUISIANA BAR NO. 04796
NOTARY PUBLIC NO. 2630
STATE OF LOUISIANA
PARISH OF CALCASIEU
MY COMMISSION IS FOR LIFE

THUS DONE AND SIGNED by Trunkline LNG Company, LLC as intervenor in the Option Agreement, at Lake Charles, Louisiana in the presence of the undersigned competent witnesses and me, Notary, on this 11th, day of September, 2013.

WITNESSES:

TRUNKLINE LNG COMPANY, LLC

Stephen M. Moore

Print Name: Stephen M. Moore

By: L.T. Stone

Name: L.T. Stone

Title: Sr. Vice President

Tedd Cooper

Print Name: Tedd Cooper

BEFORE ME: Jessica Miller

Notary Public

My Commission expires: July 12, 2014

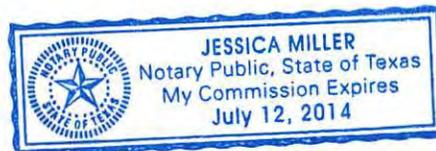


EXHIBIT 1

(Magnolia Site)

Tract 2

THAT CERTAIN TRACT OR PARCEL OF LAND LYING IN THE NORTHWEST QUARTER (NW/4) OF SECTION 16, TOWNSHIP 11 SOUTH RANGE 9 WEST CALCASIEU PARISH, LOUISIANA, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS TO-WIT:

COMMENCING AT THE NORTHEAST CORNER OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, TOWNSHIP 11 SOUTH, RANGE 9 WEST, CALCASIEU PARISH, LOUISIANA;

THENCE SOUTH 00° 36' 59" WEST, ALONG THE EAST LINE OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, FOR A DISTANCE OF 1710.61 FEET;

THENCE NORTH 89° 23' 01" WEST, PERPENDICULAR TO THE EAST LINE OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, FOR A DISTANCE OF 3327.50 FEET, TO A POINT BEING NORTH 00° 21' 53" WEST FROM THE NORTHWEST CORNER OF AN EXISTING WATER FACILITY PLANT, THE SOUTHEAST CORNER AND THE POINT OF BEGINNING OF HEREIN DESCRIBED TRACT;

THENCE NORTH 89° 35' 15" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 141.51 FEET;

THENCE NORTH 76° 41' 29" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 51.15 FEET;

THENCE NORTH 31° 56' 30" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 61.15 FEET;

THENCE NORTH 00° 27' 52" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 224.23 FEET;

THENCE NORTH 00° 05' 52" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 213.55 FEET;

THENCE NORTH 01° 29' 39" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 256.72 FEET;

THENCE NORTH 02° 15' 14" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 100.03 FEET;

THENCE NORTH 82° 51' 44" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 100.00 FEET;

THENCE NORTH 00° 34' 11" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 40.20 FEET;

THENCE NORTH 13° 39' 00" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 102.99 FEET;

THENCE NORTH 22° 49' 51" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 74.59 FEET, TO THE TOP BANK OF THE CALCASIEU RIVER INDUSTRIAL CANAL, THE NORTHWEST CORNER OF THE HEREIN DESCRIBED TRACT;

THENCE MEANDERING ALONG SAID TOP BANK, IN A GENERAL DIRECTION OF SOUTH 81° 59' 48" EAST FOR A DISTANCE OF 99.68 FEET;

THENCE MEANDERING ALONG SAID TOP BANK, IN A GENERAL DIRECTION OF SOUTH 74° 51' 36" EAST FOR A DISTANCE OF 53.10 FEET;

THENCE MEANDERING ALONG SAID TOP BANK, IN A GENERAL DIRECTION OF SOUTH 83° 48' 48" EAST FOR A DISTANCE OF 122.59 FEET;

THENCE SOUTH 00° 21' 53" EAST, FOR A DISTANCE OF 1039.55 FEET TO THE POINT OF BEGINNING.

HEREIN DESCRIBED TRACT CONTAINING 5.74 ACRES, MORE OR LESS.

EXHIBIT 1-A

(Magnolia Site)

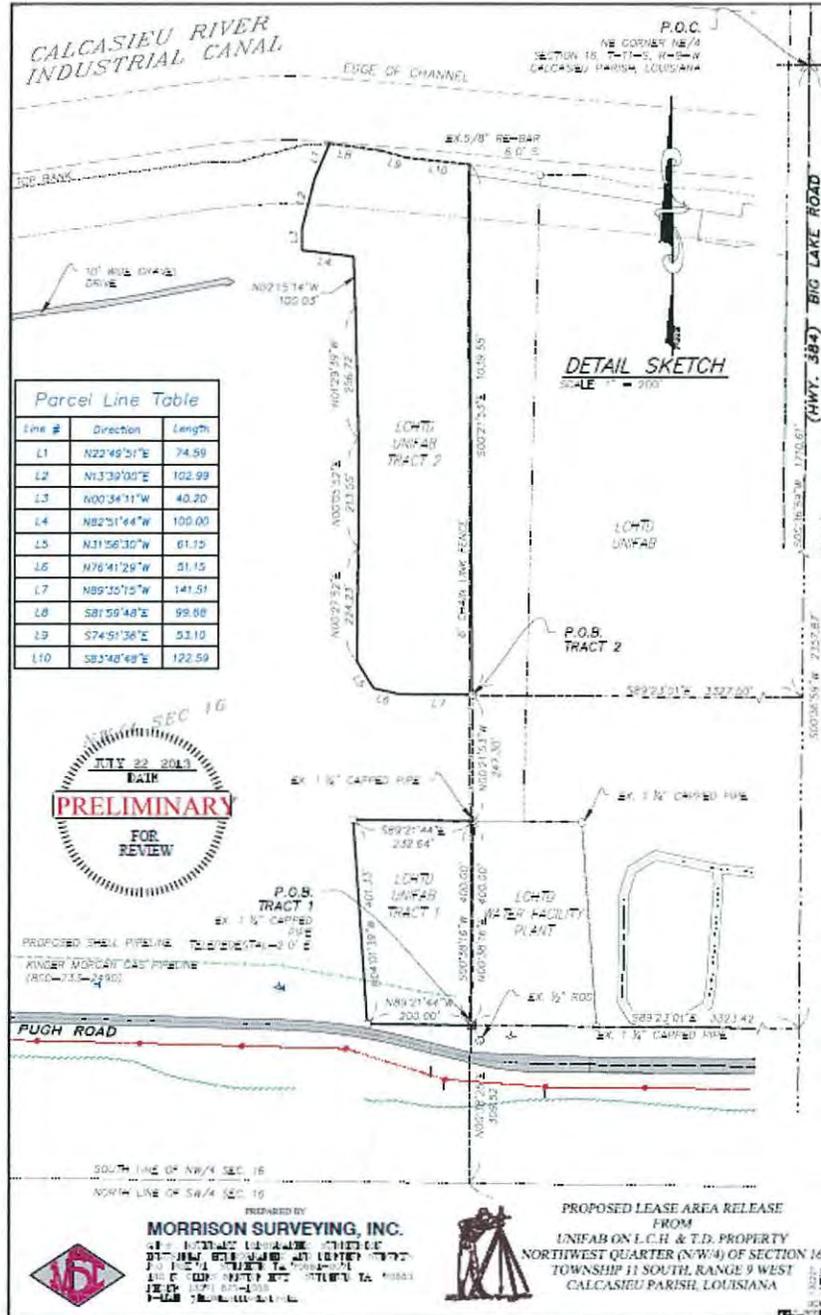


EXHIBIT 2

(Notice of Exercise)

[Date]

BG LNG Services, LLC
811 Main Street, Suite 3400
Houston, Texas 77002
Attention: Marc Hopkins or Marine Operations

Re: [Exercise of Option] [Extension of Option]

Dear Ladies and Gentlemen:

Reference is made to that certain Real Estate Lease Option Agreement dated as of _____, 2013 (the "Option Agreement") by and between Magnolia LNG, LLC, a Delaware limited liability company ("MAGNOLIA"), and BG LNG Services, LLC, a Delaware limited liability company ("BG"). All capitalized terms used in this letter shall have the meanings ascribed thereto in the Option Agreement.

This letter shall serve as written notice by MAGNOLIA to BG under the Option Agreement of MAGNOLIA's intention to [exercise its Option under the Option Agreement to enter into the Magnolia Sublease for the Magnolia Site] [extend the Option Agreement for the Extended Option Period].

No further action is required by BG in order for MAGNOLIA's [exercise of its Option] [extend the Option Agreement for the Extended Option Period] to be effective and upon delivery of this letter to the BG, MAGNOLIA shall be deemed to have [exercised its Option under the Option Agreement] [extended the Option Agreement for the Extended Option Period].

Very truly yours,

Magnolia LNG, LLC

By: _____
Its duly authorized signatory

ANNEX A

(Form of "Magnolia Sublease")

SUBLEASE AGREEMENT

THIS SUBLEASE AGREEMENT ("Secondary Sublease") is entered into this ____ day of _____, 2013 (the "Commencement Date"), by and between **BG LNG SERVICES, LLC**, a Delaware limited liability company (the "Sublessor"), and **MAGNOLIA LNG, LLC**, a Delaware limited liability company (the "Sublessee").

WITNESSETH:

WHEREAS, pursuant to the Restated and Amended Composite Lease (Turning Basin Properties) dated _____, 2013 (the "Prime Lease") between the Lake Charles Harbor & Terminal District (the "District") and Trunkline LNG Company, LLC, a Delaware limited liability company ("Trunkline"), Trunkline leased from the District certain property owned by the District, located in Calcasieu Parish, Louisiana (the "Prime Lease Property");

WHEREAS, pursuant to the Restated and Amended Sublease (Turning Basin Properties) dated _____, 2013 (the "Primary Sublease") between Sublessor and Trunkline, Sublessor subleased from Trunkline certain property covered by the Prime Lease (the "Primary Sublease Property");

WHEREAS, the Sublessee is desirous of subleasing from Sublessor a portion of the Primary Sublease Property consisting of that property described on Exhibit "A" and depicted on Exhibit "A-1" (the "Sublease Property").

WHEREAS, the Sublessor desires to sublease the Sublease Property to the Sublessee subject to the terms and conditions and for the consideration herein set forth.

NOW, THEREFORE, in consideration of the above recitals and the mutual covenants hereinafter contained, the parties herein covenant and agree as follows:

1. Definitions. As used in this Secondary Sublease, in addition to the defined terms set forth above, the following terms shall have the respective meanings indicated below:

"Adverse Event" shall mean the release into the air, land, or water of a Hazardous Substance, which release either poses a threat to the quality of air, water, land, fish, wildlife, or natural resources, or a threat of damage to person or property, and which will require remediation under CERCLA, 42 USC 9601 *et seq.*

"Applicable Laws" shall mean all present and future laws, ordinances, orders, rules and regulations of all federal, state, parish, and municipal governments, departments, commissions or offices, in each case having applicable jurisdiction over the Sublease Property, the Sublessor, or the Sublessee.

"Hazardous Substance" means any substance deemed hazardous under any of the following statutes, or under any other statute or regulation of any governmental authority: CERCLA, 42 USC 9601 *et seq.*; RCRA, 42 USC 6901 *et seq.*; HMTA, 49 USC 1801 *et seq.*; and TSCA, 15 USC 2601 *et seq.*; and the regulations promulgated thereunder.

“Impositions” means (i) all real or personal property taxes and assessments on any Sublessee Improvements that might be constructed on the Sublease Property and that are otherwise assessed on the Sublease Property (but not any income, transfer, gift, inheritance, estate, intangible personal property, corporation, or similar taxes imposed on the District by reason of its ownership of the Prime Lease Property or on Trunkline or the Sublessor by reason of its lease/sublease of the Primary Sublease Property), the personal property of Sublessee located on the Sublease Property or on the Sublessee’s interest in or under this Secondary Sublease, (ii) water and sewer rents, charges for public utilities, governmental excises, levies, license, impact and permit fees attributable to the Sublease Property and any property and equipment located thereon, including, if applicable, any water bottom usage fees allocable to the Sublease Property and (iii) other governmental charges which at any time during the term of this Secondary Sublease may be assessed, levied, confirmed, imposed upon or become due and payable in respect of or become a lien on the Sublessee Improvements that might be constructed on the Sublease Property or any part thereof or any appurtenance thereto.

“Person” means and includes natural persons, corporations, general partnerships, limited partnerships, limited liability companies, joint stock companies, joint ventures, associations, companies, trusts, banks, trust companies, land trusts, business trusts, or other organizations, whether or not legal entities, and governments and agencies and political subdivisions thereof.

“Port” means the Port of Lake Charles in Calcasieu Parish.

“Specified Use” means, without limitation, the loading, unloading, handling, treatment, processing, producing, transporting, distributing, selling, metering and/or storing of (i) natural gas, natural gas liquids, and other natural gas products, derivatives and by-products and (ii) other petroleum and hydrocarbon liquids, gases, products, derivatives and by-products, including, but not limited to, (A) the importation, regasification, production, exportation, liquefaction, refinement, enhancement, other treatment and transportation (including by ship, pipeline, truck or rail) of liquefied natural gas (“LNG”), and LNG by-products and additives and (B) the excavation for, development, construction, installation, use, operation, maintenance, repair, expansion, optimization, alteration and/or removal of any improvements, fixtures, facilities, equipment and/or appurtenances (including natural gas pipelines, natural gas liquids extraction, processing and delivery facilities, acid gas removal units, natural gas liquefaction trains, LNG regasification facilities, and other treatment facilities, cryogenic pipelines, LNG storage tanks, petroleum and other hydrocarbon liquids storage facilities, nitrogen storage and processing facilities, power generation and transmission infrastructure, marine, rail and trucking receipt, delivery and servicing facilities (including jetties, terminals, docks and loading and unloading equipment), and other utilities and facilities (including control rooms, offices, warehouses and yards), in each case, necessary, ancillary or desirable in connection with the performance of the foregoing purposes. Sublessee acknowledges and agrees that it will not utilize any dock on the Subleased Property for lay berth or vessel operations unrelated to the operation, construction, replacement or maintenance of the Sublessee Improvements or Subleased Property without the consent of the District, which consent may be conditioned on a mutually satisfactory revenue sharing arrangement.

“Sublessee Improvements” means, with respect to any buildings, structures, or improvements as may be erected on the Sublease Property by Sublessee, at any time and from time to time, those permanently attached things deemed to be immovables under Louisiana Civil

Code Articles 490-498.

“Sublessee’s Property” means all equipment, machinery, and other personal property of Sublessee and all severable fixtures of any kind placed on the Sublease Property by Sublessee consistent with its Specified Use of the Sublease Property.

“Sublessor-Created Lien” means any lien, charge, or encumbrance arising or resulting directly from acts or omissions of the Sublessor.

2. Sublease Property.

2.1 Sublessor’s Agreement to Sublease. Upon the terms and conditions hereinafter set forth, and in consideration of the payment of the Rents (hereinafter defined) and of the other charges due hereunder and the prompt performance by the Sublessee of the covenants and agreements to be kept and performed by the Sublessee under this Secondary Sublease, the Sublessor does sublease to the Sublessee, and the Sublessee hereby subleases from the Sublessor, the Sublease Property and any property and equipment located thereon for the Specified Use. Reasonable egress and ingress from and to the Sublease Property sufficient to permit the Sublessee to accomplish its purposes in connection with the Specified Use of the Sublease Property shall be made available by the Sublessor to the Sublessee as granted by Sublessor by Trunkline under the Primary Sublease and as granted by the District to Trunkline under the Prime Lease, provided that vehicular access to the Sublease Property shall be from existing entrances from Big Lake Road and Henry Pugh Boulevard. Sublessee acknowledges (i) that Seabulk Towing Services, Inc. (“Seabulk”) operates under the “Seabulk Sublease,” which covers certain property adjacent to and/or in the vicinity of the Sublease Property and (ii) that from time to time both Sublessee and Seabulk may have to make reasonable accommodations to each other in the exercise of rights and operations under their respective subleases. Sublessee further acknowledges (i) that Dynamic Industries, Inc. (“Dynamic”) operates under the “Dynamic Sublease” which covers certain property in the vicinity of the Sublease Property and (ii) that from time to time both Sublessee and Dynamic may have to make reasonable accommodations to each other in the exercise of rights and operations under their respective subleases. Sublessee further acknowledges (i) that Leevac Shipbuilding and Repair Calcasieu, L.L.C. (“Leevac”) operates under the “Leevac Sublease” which covers certain property in the vicinity of the Sublease Property and (ii) that from time to time both Sublessee and Leevac may have to make reasonable accommodations to each other in the exercise of rights and operations under their respective subleases. The parties acknowledge that this Secondary Sublease is subject to the terms of the Primary Sublease.

3. Term.

3.1 Initial Term and Extensions. The term of this Secondary Sublease shall be the period commencing on the Commencement Date and expiring on December 31, 2022, unless sooner terminated as hereinafter provided (the “Initial Term”).

3.2 Renewal Options. In consideration of and conditioned upon Sublessee being in full compliance with all terms and conditions set forth herein, Sublessor hereby grants unto Sublessee the option (“Renewal Options”) to sublease the Sublease Property for six (6) additional consecutive terms of ten (10) years each (each, an “Option Term” or “Option Terms”)

on the same terms and conditions as set forth in this Secondary Sublease. To exercise its option to sublease the Sublease Property during any Option Term, Sublessee need take no action whatsoever. It is presumed Sublessee elects to exercise its right to extend the lease during each Option Term; so, unless Sublessee notifies the Sublessor, not less than one hundred twenty (120) days prior to the expiration of any term, that it elects to waive its right to extend this Secondary Sublease beyond the term in question, the Secondary Sublease will be extended for the next Option Term. Any election to waive the right to sublease during any Option Term will terminate Sublessee's rights to sublease during any later Option Term.

3.3 All of the terms and conditions of this Secondary Sublease shall be applicable to any Option Term, and the rental shall be determined in accordance with Section 4 below. If Sublessee shall elect to exercise any Renewal Option (automatic as set forth in Section 3.2), then Sublessor shall timely renew the Primary Sublease, at least with respect to the Sublease Property, and pursuant to the intervention set forth herein by District and Trunkline, Trunkline shall timely renew its renewal options under the Prime Lease, at least with respect to the Sublease Property and District shall permit renewal of the Sublease Property only, in the event that Trunkline does not desire to renew with respect to the other Lease Property.

4. Rent.

4.1 Rent. The Sublessee shall pay to the Sublessor annual rental of EIGHTEEN THOUSAND FOUR HUNDRED THIRTY FIVE and 00/100ths (\$18,435.00) Dollars, with this amount having been paid by Sublessee at or prior to the Commencement Date with respect to the first Contract Year (The "Base Rent"). The amount of Base Rent shall be fixed for the first three (3) Contract Years, and shall be paid annually in advance on or before each anniversary of the Commencement Date during the first three (3) Contract Years. Thereafter, the Base Rent shall be adjusted and paid as set forth in Section 4.2 below. As used herein, the term "Contract Year" under this Secondary Sublease shall mean any full twelve (12) month period during either the Initial Term or any Option Term commencing, for the first such period, on the Commencement Date and, thereafter, on each anniversary of the Commencement Date.

4.2 CPI Adjustment. Commencing with the fourth (4th) Contract Year and continuing during the remainder of the Initial Term and any applicable Option Term, the Base Rent shall be adjusted, effective as of the beginning of each Contract Year (each an "Adjustment Date"), by a percentage equal to the CPI Percentage Increase (as defined below), and shall be paid annually in advance for each such Contract Year within thirty (30) calendar days after each Adjustment Date (in order to permit Sublessee to calculate the CPI Percentage Increase, as set forth below). The term "Consumer Price Index" shall mean the unadjusted Consumer Price Index for All Urban Consumers (CPI-U), All Items, U.S. City Average 1982-84=100, calculated and published by the United States Department of Labor, Bureau of Labor Statistics. In the event the Consumer Price Index is discontinued, the parties shall accept comparable statistics on the purchasing power of the consumer dollar as published at the time of said discontinuation by a responsible periodical of recognized authority to be chosen by the parties. The term "CPI Percentage Increase" shall mean, with respect to any Contract Year for which a CPI Percentage Increase is being calculated, the percentage increase calculated by subtracting the average Consumer Price Index for the last month prior to the preceding Contract Year, from the average

Consumer Price Index for the last month prior to the Contract Year for which a CPI Percentage Increase is being calculated, and dividing the positive difference, if any, by the average Consumer Price Index for the last month prior to the preceding Contract Year, and multiplying this quotient (rounded to the nearest ten thousandth) by 100. For illustrative purpose only, if the average Consumer Price Index for the last month prior to the Contract Year for which a CPI Percentage Increase is being calculated was 200.0, and the average Consumer Price Index for the last month prior to the preceding Contract Year was 175.0, then the CPI Percentage Increase would be 14.29% (i.e., $200.0 - 175.0 = 25.0 / 175.0 = 0.1429 \times 100 = 14.29\%$). No adjustment to Base Rent shall reduce the amount of Base Rent to an amount that is less than the Base Rent, as adjusted, due for the preceding Contract Year. The CPI Percentage Increase for any Contract Year shall be calculated by Sublessee, and Sublessee shall deliver written notice describing such calculation in reasonable detail ("CPI Notice"), together with adjusted annual Base Rent for such Contract Year, no later than thirty (30) calendar days after the commencement of the applicable Contract Year. If Sublessor disagrees with Sublessee's calculation of the CPI Percentage Increase, then Sublessor shall deliver to Sublessee written notice, describing the basis for such disagreement in reasonable detail ("CPI Disagreement Notice"), not later than thirty (30) calendar days after delivery of the CPI Notice. If Sublessor fails to deliver a CPI Disagreement Notice within thirty (30) calendar days after delivery of any CPI Notice, then Sublessor shall be conclusively deemed to have agreed with the calculation of the CPI Percentage Increase set forth in such CPI Notice. In the event of delivery of a CPI Disagreement Notice, upon resolution and agreement between the parties, the parties shall make an adjustment to the Base Rent previously paid with respect to such Contract Year.

4.3 Place of Payment. Base Rent shall be payable to Sublessor via funds mailed to Gulf Coast Facilities Management, LLC, 826 Union Street, Suite 200, New Orleans, Louisiana 70112, or such other address as the Sublessor may specify by written notice to the Sublessee, from time to time.

4.4 Independent Covenants. The obligation to pay Base Rent and any other sums due pursuant to this Secondary Sublease are covenants that are independent of all other covenants under this Secondary Sublease, and no Force Majeure Event (hereinafter defined) will relieve Sublessee of the obligation to pay Base Rent and all other sums due under this Secondary Sublease. Further, the term "Rent" as sometimes used herein shall include Base Rent and all other sums due and payable under this Secondary Sublease.

5. Net Sublease: Taxes and Utility Expenses: Road Costs.

5.1 Net Sublease. This Secondary Sublease is a net sublease and it is agreed and intended that the Sublessee shall pay or cause to be paid all operating costs, repair costs, and Impositions of every kind and nature whatsoever. The Sublessee shall pay to the Sublessor absolutely net throughout the term of this Secondary Sublease, the rent, operating costs, repair costs, Impositions, and other payments hereunder, free of any charge, assessments, Impositions, expenses, or deductions of any kind related to the Sublease Property, and without abatement, deduction or set off, except as expressly otherwise provided in this Secondary Sublease.

5.2 Taxes and Utility Expenses.

(a) Subject to Section 5.2(b) hereof, the Sublessee shall pay or cause to be paid, before any fine, penalty, interest, or cost may be added thereto for the nonpayment thereof, of all Impositions.

(b) The Sublessee shall bear the burden of and shall make timely remittances of all Impositions and shall file timely, with appropriate governmental units, all returns, statements, and reports legally required with respect thereto. The Sublessee shall promptly remit to any governmental unit any such Imposition, unless the Sublessee shall in good faith, with due diligence, and by appropriate judicial or administrative proceedings, contest the validity, applicability, or amount thereof. The Sublessee shall give the Sublessor ten (10) days' prior written notice of the Sublessee's intent to contest such Imposition. Any such contest shall be at the Sublessee's sole cost and expense.

(c) The Sublessee, upon the request of the Sublessor, shall furnish to the Sublessor, within fifteen (15) days after the date when an Imposition becomes delinquent if not paid, official receipts of the appropriate taxing authority or other evidence satisfactory to the Sublessor evidencing the payment thereof. The certificate, advice or bill of non-payment of such Imposition issued by the proper official designated by law to make or issue the same or to receive payment of an Imposition shall be prima facie evidence that such Imposition is due and unpaid at the time of the making of such certificate, advice, or bill.

(d) Except as expressly otherwise provided herein, nothing contained herein shall modify, amend, or constitute a waiver of, expressly or by implication, any applicable taxes or Impositions with respect to the Sublease Property and any property and equipment located thereon.

5.3 Utility Connections. The Sublessee shall be responsible for obtaining, at its own cost and expense, electricity, telephone and any and all other utility services to the Sublease Property.

6. Sublessee Improvements; Maintenance; and Use.

6.1 The Sublessee shall, at its sole cost and expense provide security lighting for the Sublease Property, and provide fencing between the Sublease Property and adjacent property, with the type and manner of such security lighting and fencing as prescribed by Applicable Laws. Sublessee may, at its sole cost, construct Sublessee Improvements at any time and from time to time as it deems necessary and appropriate in accordance with the Specified Use, subject at all times to the terms and conditions of Section 6 of the Prime Lease and of the Primary Sublease with respect to the District's approval of plans and specifications therefor (and neither BG nor Trunkline shall have any rights of approval whatsoever with respect to the Sublessee Improvements). Any Sublessee Improvements shall remain the property of the Sublessee during the term of this Secondary Sublease and any Sublessee Improvements demolished and removed by Sublessee pursuant to the preceding sentence shall remain the property of Sublessee and Sublessee may retain any amounts received for salvage or otherwise.

In the event that Sublessee fails to (i) provide security lighting for the Sublease Property, and (ii) provide fencing between the Sublease Property and adjacent property, as prescribed by

Applicable Laws, Sublessor reserves the right to arrange for same at Sublessee's expense. Upon the request of Sublessor, any such costs, fees or expenses incurred by Sublessor on Sublessee's behalf shall be payable within fifteen (15) days' notice thereof.

6.2 Sublessee Improvements - Compliance with Primary Sublease and with Laws. The Sublessee Improvements, if any, shall comply with any restrictions and requirements of the Primary Sublease and all applicable laws, ordinances, zoning regulations, rules and regulations of all federal, state, parish, municipal, or other governmental or public authorities and agencies having jurisdiction thereof.

6.3 Sublessee's Property. All of Sublessee's Property shall at all times be and remain the sole property of the Sublessee. The Sublessee shall be obligated to remove Sublessee's Property from the Sublease Property within one hundred eighty (180) days after the expiration or termination of this Secondary Sublease provided the Sublessee repairs any damage caused by such removal.

6.4 Maintenance of Sublease Property. During the continuance of this Secondary Sublease, the Sublessee shall, at its expense, keep the Sublease Property in a reasonably good state of maintenance, repair, and cleanliness. This includes the obligation to maintain all grassed areas to a maximum height of eight inches and to maintain the grassed areas and the concrete pad of the Sublease Property, if any, free from weeds. The parties hereto acknowledge that Sublessor will employ a subcontractor to ensure that any electrical supplies and equipment located or used on the Sublease Property are maintained to the correct specifications as outlined by the respective manufacturers, with the direct cost for this maintenance to be borne by Sublessee for any electrical supplies or equipment located or used on the Sublease Property.

6.5 Alterations. Sublessee may, at its sole cost, make any alterations to the Sublessee Improvements at any time and from time to time as it deems necessary and appropriate in accordance with the Specified Use, subject to the District's consent requirements set forth in Section 6.8 of the Prime Lease and Primary Sublease.

7. Acceptance of Sublease Property.

Sublessee accepts the Sublease Property and any property and equipment located thereon as suitable for its Specified Use and in its condition as of the Commencement Date, and assumes responsibility therefor to the fullest extent allowed by LSA-RS.9:3221. Sublessee expressly waives and releases Sublessor from all warranties pertaining to the condition of the Sublease Property, including, but not limited to, any warranty against visible, hidden, or latent defects, and Sublessee does also waive any right Sublessee may or might have relative thereto (i) to rescind or revoke this Secondary Sublease on the basis of any such warranty, and (ii) except for any damage to the Sublease Property arising from the gross negligence or willful misconduct of Sublessor or its employees, contractors or agents after the Commencement Date, to have Sublessor repair or replace all or any part of the Sublease Property and any component parts, improvements, equipment, fixtures and any other items that might be relative to the Sublease Property. Except for any damage to the Sublease Property arising from the gross negligence or willful misconduct of Sublessor or its employees, contractors or agents after the Commencement

Date, Sublessor shall not be required to make any improvement or repairs of any kind or character to the Sublease Property during the term of this Secondary Sublease, and Sublessee shall assume all responsibility for the Sublease Improvements and repairs necessary or desirable in connection with the Sublessee's use of the Sublease Property. To the extent that the Sublease Property or any property or equipment located thereon requires repair, modification, or alterations to comply with any Applicable Laws, Sublessee shall make such repairs, modifications, or alterations and, further, shall confirm with the appropriate governmental entity or agency that such repairs, modifications, or alterations have caused such property to be in compliance with any such Applicable Laws.

8. Sublessee's Surrender of Sublease Property.

8.1 Surrender at End of Secondary Sublease. All Sublessee Improvements constructed or placed upon, in, under, over, or through the Sublease Property by Sublessee, shall remain the property of Sublessee and may be removed by Sublessee at any time during the Initial Term or any Option Term, subject and subordinate to Section 12.6 and the rights of any Leasehold Lender under any Leasehold Mortgage. Subject and subordinate to Section 12.6 and the rights of any Leasehold Lender under any Leasehold Mortgage, upon the expiration or termination of this Secondary Sublease, Sublessor may elect, in its sole discretion, by delivery to Sublessee of written notice thereof (a "Surrender Election Notice"), to require Sublessee to either surrender possession of the Sublessee Improvements that are permanently attached to the ground upon the Sublease Property (collectively, "Permanent Facilities"), at no cost to Sublessor, in which case such Permanent Facilities shall be surrendered to Sublessor in their "as-is, where-is" condition, with all defects) or remove the Permanent Facilities (provided, however, that in no event shall Sublessee be required to remove any docks, berths, wharves, electrical interconnection infrastructure, roadways, rail lines, underground pipelines, fill materials, foundations, or other underground Sublessee Improvements, all of which may be abandoned in place in accordance with applicable laws). With respect to any scheduled expiration of this Secondary Sublease, Sublessor shall deliver the Surrender Election Notice to Sublessee not less than twenty-four (24) months prior to scheduled expiration of the Initial Term or Option Term, as applicable. With respect to any earlier termination of this Secondary Sublease, Sublessor shall deliver the Surrender Election Notice to Sublessee as soon as reasonably practicable, but not more than ten (10) calendar days after the effective date of such termination (the "Early Termination Date"). If Sublessor elects to require removal of the Permanent Facilities, then Sublessee shall have an additional period of up to twenty-four (24) months after the scheduled expiration of this Secondary Sublease or the Early Termination Date, as applicable (the "Removal Period"), to complete such removal in accordance with this paragraph, in which case the terms and conditions of this Secondary Sublease shall continue to apply during such Removal Period, except that Sublessee shall not be obligated to pay Base Rent, additional rent, Impositions, and other charges herein during the Removal Period and Sublessee may not use the Sublease Property for any purpose other than removal of the Permanent Facilities. Sublessee shall continue to have the right to use Henry Pugh Boulevard for ingress, egress and access to, from and between the Sublease Property and Big Lake Road during the Removal Period. With respect to Sublessee Improvements that are not Permanent Facilities, Sublessee shall remove such Sublessee Improvements not later than one hundred eighty (180) calendar days after the scheduled expiration of this Secondary Sublease or the Early Termination Date, as applicable. Subject and subordinate to Section 12.6 and the rights of any Leasehold Lender under any

Leasehold Mortgage, any Sublessee Improvements that are not removed by the time fixed for such removal in this paragraph shall be irrevocably deemed to be abandoned by Sublessee, and Sublessor may elect, in its sole discretion, to remove such Sublessee Improvements from the Sublease Property at Sublessee's sole cost (less any salvage value received by Sublessor) and may dispose of such Sublessee Improvements without notice or liability to Sublessee, provided, however, that title to any such Sublessee Improvements that Sublessor does not remove from the Sublease Property shall automatically pass to Sublessor. In no event shall Sublessee be required to restore the Sublease Property to their condition prior to construction of the Sublessee Improvements or to restore any alterations of the Sublease Property, and Sublessee shall surrender the Sublease Property upon the expiration or earlier termination of this Secondary Sublease (as the same may be extended by the Removal Period) in their "as-is, where-is" condition, with all defects (provided, however, that in no event Sublessee shall be excused from any default of Sublessee's obligations under this Secondary Sublease). If the Sublessee holds over after the expiration or termination of this Secondary Sublease, with or without the consent of the Sublessor, such tenancy shall be from month-to-month only. Such month-to-month tenancy, whether with or without the Sublessor's consent, shall be subject to every other term, covenant, and agreement contained herein, and shall not constitute a renewal or extension of the term of this Secondary Sublease. Sublessor shall not be responsible for any loss or damage occurring to any Sublessee Improvements owned, leased, or operated by the Sublessee, its agents, or employees, prior to or subsequent to the termination of this Secondary Sublease, other than, to the extent required by law, for such loss or damage occurring as a result of the negligent conduct or the willful misconduct or gross negligence of the Sublessor, its officers, representatives, agents, contractors or employees or the Sublessor's misrepresentations or its breach of or default under this Secondary Sublease.

8.2 Sublessor Not Liable. The Sublessor, acting in its capacity as Sublessor hereunder, shall not be responsible for any loss or damage occurring to the Sublessee Improvements or to any other real or personal property owned, leased, or operated by the Sublessee, its agents, or employees, prior to or subsequent to the termination of this Secondary Sublease, other than, to the extent permitted by law, for such loss or damage occurring as a result of the gross negligence or willful misconduct of the Sublessor, its officers, representatives, agents, or employees or the Sublessor's misrepresentations or its breach of or default under this Secondary Sublease.

9. Specified Use; Environmental Assessment; Remediation.

9.1 No Unlawful Activities. The Sublessee agrees not to make any unlawful use of the Sublease Property or Sublessee Improvements, if any, including, without limitation, any use constituting a nuisance of the Sublease Property or to adjoining or neighboring property and, further, Sublessee shall at all times comply and observe all Applicable Laws.

9.2 Permitted Uses. The Sublessee covenants not to use or permit the Sublease Property to be used for any purpose other than (i) its Specified Use, or (ii) such other uses as may be approved by the Sublessor and District in writing, which approval shall not be unreasonably withheld, conditioned or delayed. Further, Sublessee shall not use or permit the Sublease Property to be used for any use that would violate Sublessee's obligations in Section 9.3 of the Primary Sublease.

9.3 Physical Diminishment or Degradation. The Sublessee shall not cause, allow, or suffer to exist any physical diminishment or degradation of the Sublease Property, except to the extent beyond the reasonable control of Sublessee. However, this provision shall not apply with respect to any physical damage or degradation to the shoreline or bulkhead portion of the Sublease Property, if any (except to the extent caused by Sublessee). The parties acknowledge that Sublessor may or may not address the maintenance and repair of the shoreline and/or bulkhead during the term hereof.

9.4 Security. As provided in Section 6.1 hereto, Sublessee shall be responsible for providing security lighting and fencing for the Sublease Property. Any Imposition, fine, or penalty imposed for the failure of Sublessee to comply with such requirements under Applicable Laws, including any imposition, fine, or penalty imposed upon the District as owner of the Sublease Property, or upon Trunkline as the sublessor under the Primary Sublease, or upon Sublessor as the sublessee under the Primary Sublease, shall be the sole responsibility of Sublessee and Sublessee shall indemnify and hold harmless the Sublessor from the payment of any such Imposition, fine, or penalty.

9.5 Environmental Assessment; Remediation.

(a) Environmental Assessments. Prior to the Commencement Date, Sublessee shall arrange for a Phase 1 environmental assessment of the Sublease Property (the "Effective Date Phase 1") to be performed by a qualified environmental engineer mutually approved by Sublessor and Sublessee, with the costs of such effective date Phase 1 to be paid by Sublessee. If the Effective Date Phase 1 indicates that a Phase 2 environmental assessment would be prudent, Sublessor will arrange for a Phase 2 environmental assessment (the "Effective Date Phase 2") to be performed at its cost by the same or another qualified environmental engineer mutually approved by Sublessor and Sublessee. Upon termination of this Secondary Sublease, Sublessor and Sublessee shall jointly arrange for another Phase 1 environmental assessment (the "Termination Phase 1") to be performed by the same or another qualified environmental engineer mutually approved by Sublessor and Sublessee, with the costs of such Termination Phase 1 to be shared equally by Sublessor and Sublessee. To the extent that the Termination Phase 1 discloses that Sublessee has caused any environmental conditions that were not previously disclosed by the Effective Date Phase 1 ("New Conditions"), Sublessee shall promptly remediate such New Conditions in accordance with all Applicable Laws. Sublessor and Sublessee shall retain the same or another qualified environmental consultant mutually approved by Sublessor and Sublessee (an "Environmental Consultant"), at their joint cost, to determine if Sublessee has remediated such new Conditions in accordance with all Applicable Laws. If the Environmental Consultant determines that Sublessee has not remediated such New Conditions in accordance with all Applicable Laws, Sublessee shall recommence such remediation until the Environmental Consultant is satisfied. Where appropriate, in the Environmental Consultant's discretion, the Environmental Consultant shall request and receive the written approval of the Sublessee's remediation from the applicable governmental department or agency, before approving the Sublessee's remediation.

(b) Notices; Adverse Events. If, during the term hereof, Sublessee receives notice of violation of any environmental law, regulation, statute, ordinance, policy, or order related to Sublessee's operations hereunder (a "Notice") or there is an Adverse Event

caused by Sublessee relating to the Sublease Property or other property within the vicinity of the Sublease Property in which Sublessee has an interest, then Sublessee shall notify Sublessor of such violation or Adverse Event, providing copies of the Notice or any other relevant materials. Further, if such Notice or Adverse Event pertains to Sublessee's operations on the Sublease Property itself, then Sublessee agrees to promptly remediate such violation or Adverse Event in accordance with all Applicable Laws. As provided above, Sublessor shall, at Sublessee's cost, retain an Environmental Consultant to determine if the Sublessee has remediated such conditions in accordance with the requirements of the Notice and/or all Applicable Laws. If the Environmental Consultant determines that the Sublessee has not remediated the violation or the Adverse Event in accordance with the Notice and/or all Applicable Laws, then Sublessee shall recommence such remediation until the Environmental Consultant is reasonably satisfied. Where appropriate, in the Environmental Consultant's discretion, the Environmental Consultant shall request and receive written approval of the Sublessee's remediation from the applicable governmental agency or department, before approving the Sublessee's remediation.

10. Indemnification.

10.1 Sublessee's General Agreement to Indemnify. The Sublessee releases District, Trunkline, Sublessor, their respective officers, representatives, employees, agents, successors and assigns, (individually and collectively, "Sublessor Indemnitee") from, and Sublessee assumes any and all liability for, and agrees to indemnify the Sublessor Indemnitee against all claims, liabilities, obligations, damages, penalties, litigation, costs, charges, and expenses (including, without limitation, reasonable attorney's fees, engineers' fees, architects' fees, and the costs and expenses of appellate action, if any), imposed on, incurred by or asserted against the Sublessor Indemnitee arising out of (i) the Specified Use or occupancy of the Sublease Property and any property or equipment located thereon by the Sublessee, its officers, representatives, agents, and employees, (ii) the construction or operation of Sublessee Improvements, or (iii) activities on or about the Sublease Property and any property or equipment located thereon by the Sublessee, its officers, representatives, agents, and employees, of any nature, whether foreseen or unforeseen, ordinary, or extraordinary, in connection with the Specified Use and occupancy of the Sublease Property and any property or equipment located thereon by the Sublessee, its officers, representatives, agents, and employees; provided, however, that any such claim, liability, obligation, damage or penalty arising solely as a result of the negligence or willful misconduct of the Sublessor Indemnitee shall be excluded from this indemnity. The indemnity provided in this section shall include within its scope any liability imposed by law on the District, Trunkline, or Sublessor on a strict liability theory for physical defects in the Sublease Property caused or created by Sublessee and any property or equipment owned, controlled, leased, subcontracted or operated by Sublessee located thereon except for any physical defects located on property covered by the Seabulk Sublease, the Dynamic Sublease or the Leevac Sublease. This section shall include within its scope but not be limited to any and all claims or actions for wrongful death, but any and all claims brought under the authority of or with respect to any local, state, or federal environmental statute or regulation shall be covered by Section 10.2 and not this Section 10.1.

10.2 Sublessee's Environmental Indemnification. The Sublessee agrees that it will comply with all environmental laws and regulations applicable to the Sublessee, including without limitation, those applicable to the use, storage, and handling of Hazardous Substances in,

on, or about the Sublease Property. The Sublessee agrees to indemnify and hold harmless each of the Sublessor Indemnitee against and in respect of, any and all damages, claims, losses, liabilities, and expenses (including, without limitation, reasonable attorneys, accounting, consulting, engineering, and other fees and expenses), which may be imposed upon, incurred by, or assessed against any of the Sublessor Indemnitee by any other party or parties (including, without limitation, a governmental entity), arising out of, in connection with, or relating to the subject matter of (a) the Sublessee's breach of the covenant set forth above in this Section 10.2 or (b) any environmental condition of contamination on the Sublease Property or any violation of any federal, state, or local environmental law with respect to the Sublease Property first occurring after the commencement of the Initial Term of this Secondary Sublease and caused by the Sublessee's Specified Use of and its activities and operations on the Sublease Property and any property or equipment located thereon.

10.3 Survival of Indemnities. The foregoing indemnities shall survive the term of this Secondary Sublease and shall be in addition to any of the Sublessee's obligations for breach of a representation or warranty.

11. Insurance.

11.1 Commercial Liability. The Sublessee agrees to carry or cause to be carried commercial general liability insurance with respect to the Sublease Property and the property and equipment located thereon and the Specified Use and activities of the Sublessee thereon in the minimum combined single limit amount of Ten Million dollars (\$10,000,000) per occurrence and a general aggregate limit of at least Twenty Million dollars (\$20,000,000) for the death of or personal injury to one or more persons and for property damage for each occurrence in connection with the Sublease Property and the property and equipment located thereon and the Specified Use thereof or activities of the Sublessee thereon, and same shall include the Sublessor, Trunkline, and the District as additional insureds with respect to any matters arising out of this Secondary Sublease. Such insurance policy shall contain a provision or be accompanied by a certificate or endorsement to the effect that the insurance company shall not cancel or materially modify such policy without first giving written notice thereof to the Sublessor at least thirty (30) days in advance of such cancellation or material modification. At Sublessor's request, the Sublessee shall promptly provide to Sublessor certificates evidencing such insurance and shall furnish copies of such policies to Sublessor within five (5) working days.

11.2 Personal Property. The Sublessee also covenants and agrees to carry or cause to be carried "all risk" coverage or "causes of loss special form" (as such terms are used in the State of Louisiana) property insurance covering the full replacement value of the Sublease Property, all property and equipment located thereon, all Sublessee Improvements, all of Sublessee's Property, and all Equipment. Such insurance policy shall contain a provision or be accompanied by a certificate or endorsement to the effect that the insurance company shall not cancel or materially modify such policy without first giving written notice thereof to the Sublessor at least thirty (30) days in advance of such cancellation or material modification. At the Sublessor's request, the Sublessee shall promptly provide to Sublessor certificates evidencing such insurance and shall furnish copies of such policies to Sublessor within five (5) working days.

11.3 Workers' Compensation. The Sublessee further covenants and agrees, at its expense, to carry and maintain at all times, all necessary workers' compensation insurance covering all persons employed by Sublessee in and about the Sublease Property to the extent required by Applicable Laws, including, without limitation, Longshoremen's and Harbor Workers' Compensation insurance.

11.4 Excess Liability. The Sublessee further covenants and agrees to carry or cause to be carried excess liability coverage in the minimum single limit amount of Ten Million dollars (\$10,000,000) per occurrence in connection with the Sublease Property and the property and equipment located thereon and the Specified Use thereof or activities of the Sublessee thereon and same shall include Sublessor, Trunkline, and the District as additional insureds with respect to any matters arising out of this Secondary Sublease. Such insurance policy shall contain a provision or be accompanied by a certificate or endorsement to the effect that the insurance company shall not cancel or materially modify such policy without first giving written notice thereof to Sublessor at least thirty (30) days in advance of such cancellation or material modification. At the Sublessor's request, the Sublessee shall promptly provide to Sublessor certificates evidencing such insurance and shall furnish copies of such policies to Sublessor within five (5) working days.

11.5 Qualification for Insurer. All insurance policies required above shall comply with the requirements contained in Section 1.3 of the Prime Lease, including, without limitation, approvals by the District (and neither BG nor Trunkline shall have any rights of approval whatsoever with respect such matters).

11.6 Waiver of Subrogation. Sublessee and Sublessor shall ensure that any insurance policy covering the Sublease Property shall contain a waiver of subrogation against Sublessor and Sublessee, as the case may be.

12. Liens and Mortgages.

12.1 Prohibition of Liens and Mortgages. The Sublessee shall not create or permit to be created or to remain in connection with the Sublease Property or any other portion of the other Primary Sublease Property and the property and equipment located thereon or the Sublessee's Specified Use of and activities thereon, any liens or mortgages against any property interest of the Sublessor, Trunkline, or the District in the Sublease Property or any other portion of the other Primary Sublease Property and any property and equipment located thereon, and the Sublessee shall discharge any lien, encumbrance, or charge (levied on account of any Imposition or any mechanics', laborers', or materialmen's lien or security agreement) which might be or become a lien, encumbrance, or charge upon the Sublessor's, Trunkline's, or the District's interest in the Sublease Property, any part thereof, or any property or equipment located thereon in accordance with Section 12.2 hereof.

12.2 Discharge of Liens. If any mechanics', laborers', or materialmen's lien (other than a Sublessor-Created Lien) shall at any time be filed against the Sublessor's, Trunkline's, or the District's interest in the Sublease Property or any other portion of the other Primary Sublease Property, any part thereof, or any property or equipment located thereon, in connection with the Specified Use of the Sublease Property and any property or equipment

located thereon, or the Sublessee's activities thereon, the Sublessee, within 30 days after notice of the filing thereof, shall elect to contest the same or cause the same to be discharged of record by payment, deposit, bond, order of a court of competent jurisdiction or otherwise. If the Sublessee does not contest such lien and shall fail to cause such lien to be discharged within the period aforesaid, then in addition to any other right or remedy of the Sublessor hereunder, the Sublessor may, but shall not be obligated to, discharge the same either by paying the amount claimed to be due or by procuring the discharge of such lien by deposit or by bonding proceedings, and in any such event the Sublessor shall be entitled, if the Sublessor so elects, to compel the prosecution of an action for the termination of such lien by the lien or with interest, attorneys' fees, costs, and allowances. Any amount so paid by the Sublessor and all costs and expenses incurred by the Sublessor in connection therewith, including reasonable attorneys' fees together with interest thereon at one percent (1%) per annum above the prime rate of interest quoted from time to time in the Wall Street Journal, from the respective dates of the Sublessor's making of the payment or incurring of the cost and expense, shall constitute additional rent payable by the Sublessee under this Secondary Sublease and shall be paid by the Sublessee to the Sublessor within fifteen (15) days of written demand therefor.

12.3 Sublessor Not Liable For Mechanic's Liens. Nothing herein contained shall be deemed or construed in any way to constitute the consent of or request by the Sublessor, express or implied, to a contractor, subcontractor, laborer or materialman for the performance of any labor or the furnishing of any materials for any specific improvement, alteration to or repair of the Sublease Property, the Sublessee Improvements, if any, any part thereof, or any property or equipment located thereon. NOTICE IS HEREBY GIVEN THAT THE SUBLESSOR SHALL NOT BE LIABLE FOR ANY LABOR OR MATERIALS FURNISHED OR TO BE FURNISHED TO THE SUBLESSEE UPON CREDIT AND THAT NO MECHANIC'S OR OTHER LIEN FOR ANY SUCH LABOR OR MATERIALS SHALL ATTACH TO OR AFFECT THE REVERSIONARY OR OTHER INTEREST OF THE SUBLESSOR IN AND TO THE SUBLEASE PROPERTY, THE SUBLESSEE IMPROVEMENTS, IF ANY, AND ANY PROPERTY OR EQUIPMENT LOCATED THEREON.

12.4 Consent to Ground Subleasehold Mortgages. The Sublessee may not encumber the Sublease Property or any physical interest connected to this Secondary Sublease, but Sublessee may enter into a sub-leasehold mortgage on its interest in this Secondary Sublease.

12.5 Permitted Financial Use of Sublease. Sublessee may assign its interest in the Secondary Sublease for purposes of obtaining financing subject always to the prohibitions of 12.4 and 12.6.

12.6 Lender Protection Provisions. The provisions of this Section 12.6 shall supersede any contrary or inconsistent provisions in this Secondary Sublease and in the event of any inconsistency or conflict between the provisions of this Section and any other provision of this Secondary Sublease, the provisions of this Section shall govern and control.

(a) Sublessee's Right to Mortgage Leasehold Interest; Recognition of Leasehold Lender as Leasehold Mortgagee. Sublessee shall have the absolute right (but not the obligation), without seeking the consent or approval of Sublessor, to grant one or more leasehold mortgages encumbering Sublessee's interest in this Secondary Sublease and the Sublease

Property. The term "Leasehold Lender" shall mean, at any point in time, the holder of a Leasehold Mortgage that provides written notice to Sublessor of its status as such. The term "Leasehold Mortgage" shall mean, at any point in time, a leasehold mortgage to secure debt or other equivalent instruments, as the case may be (as the same may be amended from time to time), encumbering Sublessee's interest in the Sublease Property and this Secondary Sublease. It is acknowledged and agreed that, during the term of this Secondary Sublease, there may be multiple Leasehold Mortgages and multiple Leasehold Lenders and that each Leasehold Lender may, from time to time, assign its right, title and interest in and to the Leasehold Mortgage and this Secondary Sublease.

(b) Right to Perform for Sublessee; Right to Cure.

(i) In addition to the rights provided in Section 12.6(a), Sublessor acknowledges and agrees that Leasehold Lender shall have the right to perform any term, covenant, condition or agreement to be performed by Sublessee under this Secondary Sublease, and Sublessor shall accept such performance by Leasehold Lender with the same force and effect as if furnished by Sublessee. In the event of a default by Sublessee under this Secondary Sublease and prior to any termination of this Secondary Sublease by Sublessor, Sublessor acknowledges and agrees that Sublessor shall provide Leasehold Lender with notice of the same and Leasehold Lender shall have the right (but not the obligation) to commence to cure such default within the same period of time as Sublessee has under this Secondary Sublease, plus an additional sixty (60) calendar days. Sublessor agrees that Sublessor shall not terminate this Secondary Sublease in connection with any such default so long as Leasehold Lender has cured or commenced to cure and continues diligently to cure in accordance with the foregoing (A) any such non-payment default and (B) any such default in the payment of any portion of Rent, Impositions or other charges due hereunder.

(ii) If any default in the performance of an obligation of Sublessee under this Secondary Sublease is not susceptible to being cured by Leasehold Lender, Sublessor shall have no right to terminate this Secondary Sublease with respect to such default and such default shall be deemed waived for the benefit of Leasehold Lender only, provided that:

(1) Leasehold Lender shall have commenced to cure (i) any other nonpayment default of Sublessee that is susceptible to being cured by Leasehold Lender and (ii) any default in the payment of any portion of Rent, Impositions or other charges due hereunder, in each case, within the time periods prescribed under Section 12.6(b)(i), above;

(2) Leasehold Lender (or its designee) shall have commenced to acquire Sublessee's interest in this Secondary Sublease and the Sublease Property or to commence foreclosure or other appropriate proceedings under the Leasehold Mortgage within the time periods prescribed under Section 12.6(b)(i);

(3) if Leasehold Lender (or its designee) shall acquire Sublessee's interest in this Secondary Sublease and/or the Sublease Property, Leasehold Lender (or its designee) shall, without prejudice to Section 12.6(e), (A) commence to cure and continue diligently to cure all non-payment defaults that are susceptible to being cured by Leasehold Lender with commercially reasonable diligence, (B) cure any payment default in respect of any

portion of Rent, Impositions or any other charges due hereunder and (C) perform and observe all other agreements, covenants and conditions which are to be performed or observed by Sublessee under this Secondary Sublease after the date of such acquisition; and

(4) if any third party shall, by foreclosure or *dation en paiement* under the Leasehold Mortgage or by assignment or other transfer from Leasehold Lender, acquire Sublessee's interest in and to the Sublease Property under this Secondary Sublease, such third party shall, without prejudice to Section 12.6(e), (A) commence to cure and continue diligently to cure all non-payment defaults that are susceptible to being cured by a third party with commercially reasonable diligence, (B) cure any payment default in respect of any portion of Rent, Impositions or other charges due hereunder and (C) perform and observe all other agreements, covenants and conditions which are to be performed or observed by Sublessee under this Secondary Sublease after the date of such acquisition.

However, if Sublessee is in default beyond applicable notice and cure periods under this Secondary Sublease and Leasehold Lender fails to act under Section 12.6(b) above within the applicable time periods set forth in Section 12.6(b)(i), then notwithstanding any provision in this Section 12.6 to the contrary, Sublessor may exercise any right to terminate this Secondary Sublease that Sublessor may have.

(c) No Modification Without Leasehold Lender's Consent. Neither Sublessor nor Sublessee will amend, modify, cancel or surrender this Secondary Sublease without Leasehold Lender's prior written consent, and any such action taken without Leasehold Lender's consent shall not be binding on Sublessee or Leasehold Lender or their respective successors and assigns (and this Secondary Sublease shall be interpreted as if such action was not taken), provided, however, that if Sublessee is in default beyond applicable notice and cure periods under this Secondary Sublease and Leasehold Lender fails to act under Section 12.6(b) above within the applicable time periods set forth in Section 12.6(b), then Leasehold Lender's prior written consent shall not be required for Sublessor to exercise any right to terminate this Secondary Sublease that Sublessor may have under Section 12 above.

(d) Delivery of Notices. Sublessor shall simultaneously deliver to Leasehold Lender copies of all notices, statements, information and communications delivered or required to be delivered to Sublessee pursuant to this Secondary Sublease, including, without limitation, any notice of any default by Sublessee. In addition, Sublessor shall promptly notify Leasehold Lender in writing of any failure by Sublessee to perform any of Sublessee's obligations under this Secondary Sublease. No notice, statement, information or communication given by Sublessor to Sublessee shall be binding or affect Sublessee or Leasehold Lender or their respective successors and assigns unless a copy of the same shall have simultaneously been delivered to Leasehold Lender in accordance with this Section 12.6(d). All notices to Leasehold Lender shall be addressed to any Leasehold Lender at any address that such Leasehold Lender shall provide in writing to Sublessor and Sublessee, and shall be delivered in a manner permitted under this Secondary Sublease. Notwithstanding anything to the contrary in this Secondary Sublease, Sublessor shall not exercise any remedies related to Sublessee's default hereunder until (x) Sublessor has delivered notice of such default to Leasehold Lender pursuant to this Section 12.6(d) and (y) all applicable cure commencement periods following the delivery of such notice have expired.

(e) Leasehold Lender Not Obligated Under Lease; Permitted Transfers. The granting of the Leasehold Mortgage shall not be deemed to constitute an assignment or transfer of this Secondary Sublease or the Sublease Property to Leasehold Lender, nor shall Leasehold Lender, in its capacity as the holder of the Leasehold Mortgage, be deemed to be an assignee or transferee of this Secondary Sublease or of Sublessee's interests in the Sublease Property thereby created so as to require Leasehold Lender, as such, to assume the performance of any of the terms, covenants or conditions on the part of Sublessee to be performed thereunder. In no event shall any act or omission of Leasehold Lender (including, without limitation, the acquisition of Sublessee's interest in this Secondary Sublease and the Sublease Property created thereby in a transaction described in this Section 12.6 or the taking of possession of the Sublease Property or improvements thereon through a receiver or other means) require Leasehold Lender to assume, or cause Leasehold Lender to be deemed to have assumed, any obligation or liability of Sublessee under this Secondary Sublease, and Leasehold Lender shall have no personal liability to Sublessor for Sublessee's failure to so perform and observe any agreement, covenant or condition of Sublessee under this Secondary Sublease, it being expressly understood and agreed that, in the event of any such failure of Sublessee to perform, Sublessor's sole and exclusive remedy with respect to Leasehold Lender shall be to terminate this Secondary Sublease without any recourse or claim for damages against Leasehold Lender, provided that this Section 12.6(e) shall not relieve Leasehold Lender of the requirements under Section 12.6(b)(ii)(3) in the event that Leasehold Lender has elected to acquire Sublessee's interests in this Secondary Sublease and/or the Sublease Property.

(f) Permitted Transfers. Notwithstanding the provisions of Section 12.6(e), but for the avoidance of doubt while reserving Sublessor's right to terminate this Secondary Sublease pursuant to Section 12.6(b), the purchaser at any sale of this Secondary Sublease and the interests in and to the Sublease Property thereby created in any proceedings for the foreclosure of the Leasehold Mortgage (including, without limitation, power of sale), or the assignee or transferee of this Secondary Sublease and the interests in and to the Sublease Property thereby created under any instrument of assignment or transfer in lieu of the foreclosure (whether to Leasehold Lender or any third party) shall be deemed to be a permitted assignee or transferee under this Secondary Sublease without the need to obtain Sublessor's consent and Sublessor shall recognize such assignee or transferee as the successor-in-interest to Sublessee for all purposes under this Secondary Sublease, and such purchaser, assignee or transferee shall be deemed to have agreed to perform all of the terms, covenants and conditions on the part of Sublessee to be performed under this Secondary Sublease from and after the date of such purchase and/or assignment, but only for so long as such purchaser or assignee is the owner of the Sublessee's interest in, to and under this Secondary Sublease and the Sublessee's interests in and to the Sublease Property thereby created.

(g) New Direct Lease.

(i) If this Secondary Sublease is canceled or terminated for any reason (except in connection with a Bankruptcy Proceeding, for which the provisions of Section 12.6(h) below are hereby agreed upon by Sublessor and Sublessee), and provided that Leasehold Lender has (A) commenced to cure and continues diligently to cure all non-payment defaults that are susceptible to being cured by Leasehold Lender with commercially reasonable diligence, and (B) cured any payment default in respect of any portion of Rent, Impositions or

other charges due hereunder, Sublessor hereby agrees that Sublessor shall, upon Leasehold Lender's written election within one hundred twenty (120) calendar days of such cancellation or termination, promptly enter in a new, direct lease with Leasehold Lender (or its nominee or any other party which Leasehold Lender may designate, including without limitation, Sublessee) with respect to the Leased Premises on the same terms and conditions as this Secondary Sublease (a "New Lease"), it being the intention of the parties to preserve this Secondary Sublease and the interests in and to the Sublease Property created by this Secondary Sublease for the benefit of Leasehold Lender without interruption. Said New Lease shall be superior to all rights, liens and interests intervening between the date of this Secondary Sublease and the granting of the New Lease and shall be free of any and all rights of Sublessee under this Secondary Sublease.

(ii) Sublessee and Sublessor acknowledge and agree that Leasehold Lender shall have the right to encumber such direct New Lease and the estate created thereby with a deed of trust or a mortgage (as the case may be) on the same terms and with the same lien priority as the Leasehold Mortgage, it being the intention of the parties to preserve the priority of the Leasehold Mortgage, this Secondary Sublease and the interests in and to the Sublease Property created by this Secondary Sublease for the benefit of Leasehold Lender without interruption. If this Secondary Sublease is rejected, cancelled or terminated for any reason and Leasehold Lender, its nominee or a designee of Leasehold Lender enters into a direct New Lease with Sublessor with respect to the Sublease Property, Sublessor hereby agrees that it will execute such documents as Leasehold Lender may require in order to ensure that the new direct lease provides for customary leasehold mortgagee protections, including without limitation, protections similar to those contained herein.

(h) Bankruptcy. In the event of a proceeding under the United States Bankruptcy Code (Title 11 U.S.C.) as now or hereafter in effect (a "Bankruptcy Proceeding"):

(i) If this Secondary Sublease is rejected in connection with a Bankruptcy Proceeding by Sublessee or a trustee in bankruptcy (or other party to such proceeding) for Sublessee, such rejection shall be deemed an assignment by Sublessee to the Leasehold Lender of the Sublease Property and all of Sublessee's interest under this Secondary Sublease, and this Secondary Sublease shall not terminate and the Leasehold Lender shall have all rights and obligations of the Sublessee as if such Bankruptcy Proceeding had not occurred, unless Leasehold Lender shall reject such deemed assignment by notice in writing to Sublessor within thirty (30) calendar days following rejection of this Secondary Sublease by Sublessee or Sublessee's trustee in bankruptcy. If any court of competent jurisdiction shall determine that this Secondary Sublease shall have been terminated notwithstanding the terms of the preceding sentence as a result of rejection by Sublessee or the trustee in connection with any such proceeding, the rights of Leasehold Lender to a New Lease from Sublessor pursuant to Section 12.6(i) hereof shall not be affected thereby.

(ii) In the event of a Bankruptcy Proceeding against Sublessor:

(1) If the bankruptcy trustee, Sublessor (as debtor-in-possession) or any party to such Bankruptcy Proceeding seeks to reject this Secondary Sublease pursuant to United States Bankruptcy Code §365(h)(1), Sublessee shall not have the right to treat this Secondary Sublease as terminated except with the prior written consent of Leasehold Lender

and the right to treat this Secondary Sublease as terminated in such event shall be deemed assigned to Leasehold Lender, whether or not specifically set forth in the Leasehold Mortgage, so that the concurrence in writing of Sublessee and the Leasehold Lender shall be required as a condition to treating this Secondary Sublease as terminated in connection with such Bankruptcy Proceeding.

(2) Unless this Secondary Sublease is treated as terminated in accordance with Section 12.6(j)(ii)(1) above, then this Secondary Sublease shall continue in effect upon all the terms and conditions set forth herein, including Rent, but excluding requirements that are not then applicable or pertinent to the remainder of the term of this Secondary Sublease. Thereafter, Sublessee or its successors and assigns shall be entitled to any offsets against Rent payable hereunder for any damages arising from such bankruptcy, to the extent Sublessee's operation of business has been materially interfered with, and any such offset properly made shall not be deemed a default under this Secondary Sublease. The lien of the Leasehold Mortgage shall extend to the continuing possessory rights of Sublessee following such rejection with the same priority as it would have enjoyed had such rejection not taken place.

(i) Estoppel Certificates.

(i) Upon Leasehold Lender's or Sublessee's written request, Sublessor shall provide Leasehold Lender or Sublessee with an estoppel certificate which shall certify to such requesting Leasehold Lender or Sublessee (1) as to the amount and status of all Rent payments and security deposits, if any, under this Secondary Sublease, (2) as to the non-satisfaction or non-compliance by Sublessee of any other conditions under this Secondary Sublease, or alternatively, as to the full satisfaction and compliance by Sublessee of any other conditions required under this Secondary Sublease, (3) as to any existing default of Sublessee under the Secondary Sublease, or alternatively that Sublessee is not in default in the payment, performance or observance of any other condition or covenant to be performed or observed by Sublessee thereunder, (4) setting forth any offsets or counterclaims on the part of Sublessor or alternatively that there are no offsets or counterclaims on the part of Sublessor, and (5) as to such other matters related to this Secondary Sublease as Leasehold Lender may reasonably determine from time to time.

(ii) Upon Leasehold Lender's or Sublessor's written request, Sublessee shall provide Leasehold Lender with an estoppel certificate which shall certify to such requesting Leasehold Lender (1) as to the amount and status of all Rent payments and security deposits under this Secondary Sublease, (2) as to the non-satisfaction or non-compliance by Sublessor of any other conditions under this Secondary Sublease, or alternatively, as to the full satisfaction and compliance by Sublessor of any other conditions required under this Secondary Sublease, (3) as to any existing default of Sublessor under the Sublease, or alternatively that Sublessor is not in default in the payment, performance or observance of any other condition or covenant to be performed or observed by Sublessor thereunder, (4) setting forth any offsets or counterclaims on the part of Sublessor or alternatively that there are no offsets or counterclaims on the part of Sublessee, and (5) as to such other matters related to this Secondary Sublease as such Leasehold Lender may reasonably determine from time to time.

(j) No Merger. There shall be no merger of this Secondary Sublease or any interest in this Secondary Sublease or of the interests in and to the Sublease Property created thereby with the fee estate in the Sublease Property, by reason of the fact that this Secondary Sublease or such interest therein, may be directly or indirectly held by or for the account of any person who shall hold any interest in the fee estate in the Sublease Property, nor shall there be such a merger by reason of the fact that all or any part of the interests in and to the Sublease Property created by this Secondary Sublease may be conveyed or mortgaged in a leasehold mortgage, deed of trust, deed to secure debt or other equivalent instrument (as the case may be) to a mortgagee or beneficiary who shall hold any interest in the fee estate in the Sublease Property or any interest of Sublessor under this Secondary Sublease.

(k) Sublessor's Recognition of Sublessee. Sublessor hereby recognizes Sublessee as the current tenant party to this Secondary Sublease and acknowledges and agrees that Sublessee acquired its interest in this Secondary Sublease and in and to the Sublease Property in accordance with the terms of this Secondary Sublease.

(l) Agreement to Amend. Sublessor recognizes the importance of Sublessee's ability to obtain Leasehold Mortgages, and that the provisions of this Secondary Sublease may be subject to the approval of a Leasehold Lender. If any Leasehold Lender should require, as a condition to such financing, any reasonable modifications of this Secondary Sublease, whether for purposes of clarifying the provisions of this Secondary Sublease or to include provisions then customary for leasehold financing transactions, Sublessor agrees to execute the appropriate amendments to this Secondary Sublease; provided, however, that no such modification shall, to the detriment of Sublessor, impair any of Sublessor's rights, as reasonably determined by Sublessor or increase any of Sublessor's obligations, as reasonably determined by Sublessor, under this Secondary Sublease.

(m) Third-Party Beneficiary. Notwithstanding anything to the contrary in this Secondary Sublease, each Leasehold Lender shall be a third-party beneficiary solely and exclusively with respect to the provisions of this Section 12.6. There are no other third-party beneficiaries to this Secondary Sublease.

(n) Subordination of Sublessor's Lien. Sublessor hereby subordinates any lien or privilege it may have on any movables found from time to time in or upon the Sublease Property, including without limitation, Sublessor's privileges pursuant to La. Civil Code Articles 2707, *et seq.*, to any Leasehold Lender's rights under this Section 12.6 and the lien of any Leasehold Mortgage.

(o) No Waiver. Neither acceptance of Rent by Sublessor nor failure by Sublessor to complain of any action, non-action or default of Sublessee, whether singular or repetitive, shall constitute a waiver of any of Sublessor's rights hereunder. Waiver by Sublessor of any right pertaining to any default of Sublessee shall not constitute a waiver of any right for either a subsequent default of the same obligation or any other default. No act or thing done by Sublessor or Sublessor's agents shall be deemed to be acceptance of surrender of the Sublease Property and no agreement to accept a surrender of the Sublease Property shall be valid unless it is in writing and signed by Sublessor.

13. Entry on Sublease Property.

Sublessor, District and/or Trunkline may request entry into the Sublease Property during normal business hours by delivery of a written request to Sublessee a reasonable time (but in any event not less than twenty-four (24) hours) prior to the requested entry, and Sublessee shall not unreasonably withhold its approval of such request, provided, however, that any entry into the Sublease Property by Sublessor, District, Trunkline and/or their respective employees or agents shall be subject to Sublessee's rules and security procedures and all applicable laws, permits and regulations.

14. Restriction on Assignments and Transfers.

14.1 The Sublessee shall not assign this Secondary Sublease, in whole or in part, or sublet all or any portion of the Sublease Property, without the written consent of the Sublessor, which consent Sublessor will not unreasonably withhold, condition or delay, provided Sublessee is not in default beyond applicable periods of notice and/or cure under this Secondary Sublease. Unless specifically agreed and consented to by Sublessor, no such subleasing or assignment shall relieve Sublessee of Sublessee's obligations hereunder. In the event that Sublessee enters into such sublease or assignment, at the request of the sublessee or assignee, Sublessor shall enter into a direct agreement with such sublessee, (a) providing that if this Secondary Sublease is cancelled or terminated, Sublessor shall enter into a direct New Lease with such sublessee for the balance of the term of this Secondary Sublease and otherwise on substantially the same terms and conditions of this Secondary Sublease, and (b) containing lender provisions substantially similar to those set forth in Section 12.6.

14.2 Notwithstanding the foregoing, Sublessee shall have the right without the requirement of consent by Sublessor, to assign Sublessee's rights, title and interest in, to and under this Secondary Sublease to (a) any Affiliate (as defined below) of Sublessee, (b) any transferee or grantee of all or substantially all of the assets of Sublessee or ownership interests (whether stock, shares or membership interests) in Sublessee, (c) any entity resulting from a merger, non-bankruptcy reorganization or consolidation with Sublessee, (d) to any entity owned by an Affiliate or Affiliates of one or more of the ultimate parent entities that own direct or indirect interests in Sublessee or (e) a Leasehold Lender or any purchaser upon a foreclosure of a Leasehold Mortgage or transferee upon a transfer in lieu of foreclosure (dation en paiement) pursuant to a Leasehold Mortgage; provided, in each case, that such assignment shall not be a subterfuge by Sublessee to avoid its obligations under this Secondary Sublease, and upon such assignment, Sublessee shall not be released from liability under this Secondary Sublease without Sublessor's written consent. The term "Affiliate" shall mean (i) Sublessee's parent company or any wholly owned subsidiary of Sublessee's parent company, or (ii) any entity Controlling, under common Control or Controlled by Sublessee or Sublessee's parent company. The term "Control" shall mean (A) with respect to a corporation, the right to exercise, directly or indirectly, more than fifty percent (50%) of the voting rights attributable to the stock or shares of the controlled corporation, and (B) with respect to an individual or entity that is not a corporation, the possession, directly or indirectly, of the power to direct or cause the direction of the management or policies of the controlled individual or entity.

15. [Reserved]

16. Events of Default of Sublessee.

If any one or more of the following events shall happen and not be remedied as herein provided, an Event of Default shall be deemed to have occurred:

16.1 Breach of Covenant. If (i) Sublessee fails to make a timely payment of Rent, Impositions or any other amount due hereunder and such failure continues for a period of ten (10) days after receipt of notice that such rental or other charges are due, or (ii) Sublessee defaults in the performance of or compliance with any of the covenants, agreements, terms, or conditions contained in this Secondary Sublease (other than the payment of Rent, Impositions or any other amount due hereunder) for a period of thirty (30) days after receipt of written notice thereof from Sublessor specifying the nature of any such default and the acts required to cure same, or (iii) in the case of a default or a contingency which cannot with due diligence be cured within such period of thirty (30) days, the Sublessee fails to proceed with all due diligence within such period of thirty (30) days, to commence cure of the same and thereafter to prosecute the curing of such default with all due diligence (it being intended that in connection with a default not susceptible of being cured with due diligence within thirty (30) days that the time of the Sublessee within which to cure same shall be extended for such period as may be necessary to complete the same with all due diligence), Sublessee shall be *ipso facto* in default of this Secondary Sublease.

16.2 Sublessor's Remedies; Cure.

(a) Right to Terminate. Upon the occurrence of an Event of Default and subject to Section 12.6, Sublessor may terminate this Secondary Sublease by giving written notice to the Sublessee. This Secondary Sublease shall be deemed to expire and terminate on the date that Sublessor specifies in such notice, except that Sublessee waives his right to notice, and this Secondary Sublease, the term hereby demised, and the rights of the Sublessee under this Secondary Sublease shall expire and terminate immediately.

(b) Waiver of Notice. Upon termination of the right of occupancy for any reason, Sublessee hereby expressly waives notice to vacate the premises prior to institution of eviction proceedings in accordance with La.C.C.P. Art. 4701.

(c) Right to Cure. Upon the occurrence of an Event of Default, the Sublessor may take whatever actions are reasonably necessary to cure such Event of Default, including the hiring of attorneys, contractors, consultants, architects, engineers, laborers, or others, purchasing the required goods or services and procuring necessary insurance or performance bonds. The Sublessee shall be responsible for all costs, including attorney's fees and the fees of other professionals, reasonably incurred by the Sublessor pursuant to this Section and such costs shall be billed to the Sublessee in addition to any and all rent due hereunder. The Sublessee shall pay all such additional costs and charges within fifteen (15) days after billing by the Sublessor.

(d) Injunctions and Damages. Upon the occurrence of any Event of Default hereunder, the Sublessor at any time thereafter shall have the right to enjoin such breach and to invoke any right and remedy allowed herein, by law or in equity (except for the right of specific performance), or by statute or otherwise including, without limitation, remedies at law

for damages and for reimbursement of expenses to the Sublessor in connection with any such action, including reasonable attorney's fees, costs, and appellate expenses.

16.3 Taking of Possession; Acceleration of Rent. Upon any expiration or termination of this Secondary Sublease or any termination by summary proceedings or otherwise and subject at all times to Section 12.6, (a) the Sublessee shall quietly and peacefully surrender the Sublease Property to the Sublessor, without any payment therefor by the Sublessor, and the Sublessor, upon or at any time after any such expiration or termination, may without further notice, enter upon and reenter the Sublease Property, by summary proceedings, ejectment, or otherwise, and may dispossess the Sublessee and remove the Sublessee and all other persons and property, including any Equipment, from, in, and around the Sublease Property and may have, hold, and enjoy the Sublease Property and the right to receive all rental income of and from the same; and (b) the Sublessor shall be entitled to collect forthwith upon such termination as liquidated damages, an amount equal to the then outstanding Rent; and (c) all obligations of the Sublessee hereunder for additional rent, or Impositions, or any portion thereof arising or accruing with respect to any period prior to such termination and any obligations of the Sublessee under the indemnification provisions hereof arising or accruing with respect to any period prior to such termination hereof, in each case without regard to whether such matter is first noticed to the Sublessor prior to or subsequent to such termination, shall survive the termination hereof.

16.4 Agent for Service. The Sublessee shall maintain a registered agent of the Sublessee for service of process, which agent will be located within the State of Louisiana. The Sublessee shall provide the name and address of such agent or any successor agent to the Sublessor in writing prior to the commencement of the Secondary Sublease term. If the Sublessee shall fail to maintain such a registered agent within the State of Louisiana, service of process may be accomplished by public posting on the Sublease Property in the same manner and for the same period as provided in Louisiana statutes, with written notice becoming effective at the time of posting.

17. Events of Default of the Sublessor.

17.1 Sublessor's Event of Default. Any failure of the Sublessor to comply with any of its obligations under this Secondary Sublease shall constitute a "Sublessor's Event of Default" hereunder if such failure continues for forty-five (45) days after the Sublessee gives the Sublessor written notice thereof and the acts required to cure the same.

17.2 Sublessee's Remedies. In the event of any Sublessor's Event of Default under this Secondary Sublease, the Sublessee shall have the right to invoke any remedy allowed by law, including, without limitation, termination of this Secondary Sublease by written notice to the Sublessor.

17.3 Expenses Incurred by Sublessee. If Sublessee shall at its option (and without obligation) cure any defaults of Sublessor under or with respect to the Primary Sublease, then Sublessor shall reimburse Sublessee for all costs and expenses incurred by Sublessee in connection with such cure, and shall be paid by the Sublessor to the Sublessee within fifteen (15) days of written demand therefor.

18. Mutual Obligations.

18.1 Late Charges: Interest. If any Rent, Imposition or other sum due hereunder is not paid when due under this Secondary Sublease, and if such delinquency continues for a period of ten (10) days after written notice from the Sublessor to Sublessee, such sum shall bear a late charge equal to twelve percent (12%) of the amount thereof, the parties recognizing and agreeing that such charge represents a reasonable approximation of the additional administrative costs and expenses which are likely to be incurred by the non-defaulting party. Additionally, and except where otherwise provided herein, any sum not paid within twenty (20) days after its due date and any judgment rendered therefor shall bear interest after said twentieth (20th) day to the date of collection at the rate of twelve percent (12%) per annum.

18.2 Obligations to Mitigate Damages. Both the Sublessor and the Sublessee shall have the obligation to take reasonable steps to mitigate their damages caused by any default under this Secondary Sublease.

18.3 Failure to Enforce Not a Waiver. No failure by either party to insist upon the strict performance of any covenant, agreement, term, or condition of this Secondary Sublease or to exercise any right or remedy arising upon the breach thereof; and no acceptance by the Sublessor of full or partial rent during the continuance of any such breach, shall constitute a waiver of any such breach of such covenant, agreement, term, or condition. No covenant, agreement, term, or condition of this Secondary Sublease to be performed or complied with by either party and no breach thereof shall be waived, altered, or modified except by a written instrument executed by both parties. No waiver of any breach shall affect or alter this Secondary Sublease, but each and every covenant, agreement, term, or condition of this Secondary Sublease shall continue in full force and effect with respect to any other then existing or subsequent breach hereof.

18.4 Rights Cumulative. Each right and remedy of the parties provided in this Secondary Sublease shall be cumulative and shall be in addition to every other right or remedy provided for in this Secondary Sublease or now or thereafter existing at law or in equity or by statute or otherwise (excluding, however, specific performance against the Sublessee) and the exercise or beginning of the exercise by the parties of any one or more of such rights or remedies provided for in this Secondary Sublease or now or hereafter existing at law or in equity or by statute or otherwise shall not preclude the simultaneous or later exercise by the parties of any or all other such rights or remedies provided for in this Secondary Sublease or now or hereafter existing at law or in equity or by statute or otherwise.

19. Notices.

19.1 Addresses. All notices required or allowed by this Secondary Sublease shall be delivered by email (with a requirement that such electronic notice shall be followed within three (3) calendar days by written notice delivered in one of other manners permitted in this paragraph), third party overnight courier (including overnight courier services such as Federal Express) or by certified mail, return receipt requested, postage prepaid, addressed to the party to whom notice is to be given, at the following addresses:

If to MAGNOLIA:

Magnolia LNG, LLC

616 Broad Street
P.O. Box 3759 (70602)
Lake Charles, LA 70601
Attention: Company Secretary
Email: dgardner@lnglimited.com.au

with a copy to:

Winfield E. Little, Jr.
616 Broad Street
P.O. Box 3759 (70602)
Lake Charles, LA 70601
Email: wlittle@littlelawfirm.com

and

Chad Mills
Sutherland Asbill & Brennan LLP
1001 Fannin Street, Suite 3700
Houston, TX 77002-6760
Email: chad.mills@sutherland.com

If to BG:

BG LNG Services, LLC
811 Main Street, Suite 3400
Houston, TX 77002
Attention: Marc Hopkins or Marine Operations
Email: mark.hopkins@bg-group.com
shipping.operations@bg-group.com

19.2 Notice shall be deemed to have been given upon receipt by recipient (provided that any notice by email shall have been followed within three (3) calendar days by written notice delivered in one of the other manners permitted under this paragraph), by the overnight courier airbill or by the return receipt. In the event that the recipient fails or refuses to sign the return receipt for delivery by certified mail, the receipt shall be sufficient.

20. Quiet Enjoyment; Title; Further Assurances.

20.1 Quiet Enjoyment. Subject to the terms and conditions of this Secondary Sublease, the Sublessee, upon paying the Rent and all additional rent, Impositions, and other charges herein provided for and observing and keeping all covenants, agreements, and conditions of this Secondary Sublease on its part to be kept and performed in all material respects, shall quietly have and enjoy the Sublease Property during the term of this Secondary Sublease, without hindrance or molestation by the Sublessor or anyone claiming under or through the Sublessor. This agreement shall be construed as a covenant running with the land. Further and notwithstanding anything else contained in this Section 20.1 or elsewhere in this Secondary Sublease, Sublessee acknowledges that (a) Sublessor and Trunkline are or will be utilizing property adjacent to the Sublease Property and in the vicinity of the Sublease Property, for (i) a similar project and uses similar to the Specified Use and (ii) for terminalling services, activities and operations (collectively, the "Sublessor/Trunkline Uses"); (b) Sublessor and/or Trunkline may, and specifically reserve the right to, object or take such other legal actions against Sublessee with respect to Sublessee's activities and operations on the Sublease Property or on

property adjacent to or in the vicinity of the Sublease Property on the basis that such Sublessee activities and/or operations are unreasonably interfering (or will unreasonably interfere) with the Sublessor/Trunkline Uses; (c) any such objections or other legal actions so taken by Trunkline or Sublessor shall not constitute (i) a breach by Trunkline or Sublessor of this Section 20.1 or any other provision of this Secondary Sublease or (ii) a disturbance of Sublessee's possession of the Sublease Property; and (d) any such objection(s) or legal actions taken by Trunkline or Sublessor shall not entitle Sublessee to any abatement of or reduction in Rent or other charges due by Sublessee under this Secondary Sublease.

20.2 Sublessor's Title. Except as otherwise provided herein, Sublessor represents and warrants as a condition of this Secondary Sublease that the Primary Sublease is valid and in effect and that Sublessor has the right thereunder to make this Secondary Sublease for the term hereof. Except as set forth in this Section 20.2 or elsewhere in this Secondary Sublease, this Secondary Sublease is made without warranty of title or possession either express or implied. This Secondary Sublease, as it applies to the Sublease Property, is subject to all matters of record as of the Commencement Date with respect to the Sublease Property.

20.3 Further Assurances. Notwithstanding anything to the contrary contained in this Secondary Sublease, the Sublessor and the Sublessee agree that they shall in good faith undertake to perform their covenants, agreements and obligations in this Secondary Sublease, to satisfy all conditions and to cause the transaction contemplated by the purposes of this Secondary Sublease to be carried out promptly in accordance with the terms hereof. Each party shall do such things as may be reasonably requested by the other party, at the expense of the requesting party, in order to accomplish more effectively the purposes and other agreements contemplated by this Secondary Sublease.

21. Casualty; Eminent Domain.

21.1 Casualty. This Secondary Sublease shall not terminate or be cancelled at any time upon the damage or destruction by fire or other casualty of all, substantially all, or any part of the Sublease Property or the Sublessee's Improvements. Sublessee shall have full use of and the right to apply its insurance proceeds available for rebuilding and restoration of Sublessee Improvements.

21.2 Condemnation or Expropriation. If the whole of the Sublease Property shall be taken under power of eminent domain or expropriation by any public or private authority, then this Secondary Sublease and the applicable term hereof shall cease and terminate as of the date of such taking. If only a portion of the Sublease Property shall be taken, and such partial taking shall result in the inability of Sublessee to operate its Sublessee Improvements, or have a material adverse effect upon Sublessee's operation of its Sublessee Improvements, on the remainder of the Sublease Property, then Sublessee may, at its election, terminate this Secondary Sublease by giving Sublessor notice of the exercise of Sublessee's election within one hundred twenty (120) calendar days after Sublessee shall receive notice of such taking. In the event of termination under this Section 21, and any unearned Rent or other charges, if any, paid in advance, shall be refunded to Sublessee, and this Secondary Sublease shall cease and terminate as of the date of such taking, subject, however, to the right of Sublessee, at its election, (i) to continue to occupy the Sublease Property, subject to the terms and provisions of this Secondary

Sublease, for all or such part, as Sublessee may determine, of the period between the date of such taking and the date when possession of the Sublease Property shall be taken by the public authority; and (ii) to keep this Secondary Sublease in full force and effect so as to obtain the highest possible award from the condemning authority, if termination of this Secondary Sublease would reduce any award for a taking, as set forth herein below in this Section 21.1. In the event of a taking of a portion of the Sublease Property and this Secondary Sublease is not terminated, then Base Rent shall be reduced pro rata based upon the portion of the Sublease Property taken. The parties reserve any rights each may have under applicable law to seek from the expropriating authority an award for a taking of their respective interests in, under and to the Sublease Property and this Secondary Sublease. All compensation awarded for any taking of the Sublease Property shall belong to the party to whom such award was made. If only one award is made as to the Sublease Property, such award shall be allocated between Sublessor and Sublessee in accordance with their respective interests. Notwithstanding the foregoing, any award attributable or applicable to any improvements on the Sublease Property shall belong to Sublessee. Sublessor agrees that, to the extent permitted by law, Sublessor waives and forebears the use of any of its power of expropriation that would impair Sublessee's interest in, under and to this Secondary Sublease or the performance of this Secondary Sublease.

22. Force Majeure. In the event that Sublessee shall be delayed or hindered in or prevented from the performance of any act required hereunder (other than payment of Rent, Impositions or other charges) by reason of any event that is outside the reasonable control of Sublessee, including, but not limited to, strikes, lock-outs, labor troubles, inability to procure materials, failure of power, restrictive governmental laws or regulations, changes in governmental laws or regulations, delay in obtaining permits beyond the time periods for obtaining permits that existed as of the Commencement Date (provided that such delay did not result from failure of Sublessee to comply with the clear requirements of the permitting office), riots, insurrection, civil unrest, war, terrorist act, act of a public enemy, sabotage, blockade, embargo, hurricane, fire, flood, tornado, earthquake, storm, lightning, washout, explosion, or other reason of a like nature not the fault of the party delayed in performing work or doing acts required under the terms of this Secondary Sublease ("Force Majeure Event"), then performance of such act shall be excused temporarily but shall accrue during the period of the delay and the period for the performance of any such act shall be extended for a period equivalent to the period of such delay. The provisions of this Section 22 shall not relieve Sublessee of any of its other obligations hereunder nor operate to excuse Sublessee from prompt payment of all Rent, Impositions or other charges. Notwithstanding anything to the contrary contained in this Secondary Sublease, in the event of a Force Majeure Event, the prolonged effects of which prevent the commercially reasonable use of the Sublease Property or the Sublessee Improvements (or the construction or reconstruction of the Sublessee Improvements following a casualty or Force Majeure Event), for more than twelve (12) consecutive months, then Sublessee shall have the right to terminate this Secondary Sublease by giving notice to Sublessor.

23. Miscellaneous.

23.1 Time is of the Essence. Time is of the essence of each and all of the terms and provisions of this Secondary Sublease.

23.2 Access to Premises. The Sublessee agrees to comply with any and all reasonable rules and regulations of the District and Sublessor regarding access to secured areas of the port and regarding the proper identification of all visitors to the Sublease Property, provided that such rules and regulations do not conflict with any requirements imposed upon Sublessee by the Federal Energy Regulatory Commission or any other federal or state agency having jurisdiction over the Sublease Property.

23.3 Successors. The covenants, agreements, terms, provisions, and conditions contained in this Secondary Sublease shall apply to and inure to the benefit of and be binding upon the Sublessor and the Sublessee and their respective successors and assigns, except as expressly otherwise herein provided, and shall be deemed covenants running with the respective interests of the parties hereto.

23.4 Surviving Covenants. Each provision of this Secondary Sublease which may require performance in any respect by or on behalf of either the Sublessee or the Sublessor after the expiration of the term hereof or its earlier termination shall survive such expiration or earlier termination.

23.5 Provisions Deemed Conditions and Covenants. All of the provisions of this Secondary Sublease shall be deemed and construed to be “conditions” and “covenants” as though the words specifically expressing or importing covenants and conditions were used to each separate provision hereof.

23.6 Headings. The headings and section captions in this Secondary Sublease and the Table of Contents are inserted only as a matter of convenience and for reference and in no way define, limit, or describe the scope or intent of this Secondary Sublease or in any way affect this Secondary Sublease as to matters of interpretation or otherwise.

23.7 Entire Agreement; No Oral Change or Termination. This Secondary Sublease and the exhibits appended hereto and incorporated herein by reference contain the entire agreement between the parties hereto with respect to the subject matter hereof and no change, modification, or discharge hereof in whole or in part shall be effective unless such change, modification, or discharge is in writing and signed by the party against whom enforcement of the change, modification, or discharge is sought. This Secondary Sublease is the full and complete agreement applicable between the parties, shall be the controlling agreement between the parties, and cannot be changed or terminated orally.

23.8 Governing Law; Severability. This Secondary Sublease shall be governed by and construed in accordance with the laws of the State of Louisiana. If any term or provision of this Secondary Sublease or the application thereof to any person or circumstance shall, to any extent, be invalid or unenforceable, the remaining provisions of this Secondary Sublease or the application of such term or provision to persons or circumstances other than those as to which it is held invalid or unenforceable, shall not be affected thereby, and each term and provision of this Secondary Sublease shall be valid and enforceable to the fullest extent permitted by law.

23.9 Counterparts. This Secondary Sublease may be executed in one or more counterparts, each of which so executed shall be deemed to be an original and all of which together shall constitute but a single document.

23.10 Arbitration. Any dispute or controversy between the parties arising out of or related to this Secondary Sublease shall, if the parties are unable to resolve such dispute amicably, be finally settled by arbitration between the parties using the Commercial Rules of Arbitration of the American Arbitration Association to be held in Houston, Texas, but the matter need not be submitted to AAA. The arbitration shall be conducted before a panel of three arbitrators, one to be selected by each party, and the third to be selected by the first two. The arbitration award may be enforced by application to any court of competent jurisdiction and the losing party shall pay all reasonable costs and expenses (including reasonable attorneys' fees) of the prevailing party.

23.11 Gender of Words. Words of any gender in this Secondary Sublease shall be held to include masculine or feminine and words denoting a singular number shall be held to include the plural, and plural shall include the singular, whenever the sense requires.

23.12 Authority. The Sublessor represents and warrants that it has the authority to enter into this Secondary Sublease, that, when executed, this Secondary Sublease shall be binding and enforceable in accordance with its terms.

23.13 No Brokers. Neither party to this Secondary Sublease shall be liable for any real estate brokers' or leasing agents' commissions in the absence of a written agreement which expressly provides therefor and which is to be charged.

23.14 Legal Relationships. This Secondary Sublease shall not be interpreted or construed as establishing a partnership or joint venture between the Sublessor and the Sublessee and neither party shall have the right to make any representations or be liable for the debts or obligations of the other. Neither party is executing this Secondary Sublease as an agent for an undisclosed principal. No third party is intended to be benefited by this contract.

23.15 Memorandum of Lease. At either party's request, the parties hereto agree to execute and cause to be properly recorded a memorandum of this Secondary Sublease, sufficient in form and content to give third-parties constructive notice of the Sublessee's interest hereunder.

INTERVENTION BY DISTRICT AND TRUNKLINE

And now into these premises comes LAKE CHARLES HARBOR & TERMINAL DISTRICT ("District") and TRUNKLINE LNG COMPANY, LLC ("Trunkline") which intervene for the purpose of and do hereby consent to the entering into this Secondary Sublease among Sublessor and Sublessee, which further consent and agree to the following:

A. District and Trunkline consent to this Secondary Sublease and to the Specified Use proposed for the Sublease Property. Where approval or consent of District or Trunkline is required under the Primary Sublease (including, for the avoidance of doubt, for uses beyond the

Specified Use), District and Trunkline agree not to unreasonably withhold, delay or condition such approval or consent.

B. Sublessee agrees that it will not sublease the Sublease Property without the approval of District, which approval District agrees shall not be unreasonably withheld, delayed or conditioned.

C. District agrees to waive the provision set forth in Section C of the District's Intervention contained in the Primary Sublease with respect to this Secondary Sublease and any other equivalent provision contained in the documents ancillary to the Primary Sublease.

D. District and Trunkline each acknowledge and agree that the Primary Sublease is in full force and effect.

E. Upon the occurrence of any event that would give District the right to terminate the Prime Lease, or Trunkline the right to terminate the Primary Sublease, as the case may be, or in the event that Trunkline or Sublessor fails to timely exercise any renewal options thereunder, District and/or Trunkline, as applicable, agree to send written notice to Sublessee describing the circumstances giving rise to such right to terminate and what would need to be done by Trunkline or Sublessor to prevent such termination or that the renewal option(s) have not been timely exercised by Sublessor or Trunkline, whichever the case may be (an "Impending Termination Notice"). Any such notice shall contain a conspicuous notice, in bold font and all capitalized letters, noting that Sublessee's response is necessary to prevent the termination of this Secondary Sublease. If the event giving rise to District's and/or Trunkline's right to terminate concerns Trunkline's or Sublessor's failure to pay any undisputed monies due, Sublessee shall have ten (10) days from receipt of the Impending Termination Notice to prevent termination by making payment on Trunkline's or Sublessor's behalf, whichever the case may be. If the event giving rise to District's or Trunkline's right to terminate is something other than Trunkline's or Sublessor's failure to pay an undisputed amount and Sublessee informs District and/or Trunkline within ten (10) days of receipt of the Impending Termination Notice that it plans to use reasonable efforts to cure or remedy such event, then District and/or Trunkline shall suspend its termination right until sixty (60) days after the date that Sublessee receives the Impending Termination Notice, at which time District and/or Trunkline may exercise its right to terminate if the event giving rise to the Impending Termination Notice has not been cured or remedied. If the event giving rise to District's and/or Trunkline's right to terminate concerns Trunkline's or Sublessor's failure to timely exercise its renewal option under the applicable Primary Sublease or Trunkline Restated Lease, the District and/or Trunkline, shall provide the Impending Termination Notice to Sublessee not later than three (3) business days after the date to exercise such renewal option(s) expired and Sublessee shall have thirty (30) days from receipt of such Impending Termination Notice to elect to exercise the applicable renewal option under the applicable lease(s), but only with respect to the Sublease Property and the District and/or Trunkline shall accept such exercise from Sublessee and enter into such further agreements or documents as Sublessee deems necessary to evidence such exercise of the renewal option with respect to the Sublease Property. In the event any such renewal of the Prime Lease or the Primary Sublease shall be impossible due to the failure or refusal of Trunkline or Sublessor to exercise the applicable renewal option(s) under the applicable lease(s), or in the event a Bankruptcy Proceeding against Trunkline or Sublessor prevents or inhibits any such renewal, or if any such Bankruptcy Proceeding results in the rejection, cancellation or termination of this

Secondary Sublease for any reason, the District and Trunkline hereby agree that it shall, upon Sublessee's written election within one hundred twenty (120) calendar days after such cancellation or termination or after determination of Sublessee of such failure or refusal, promptly enter in a new, direct lease with Sublessee with respect to the Sublease Property on the same terms and conditions as this Secondary Sublease, it being the intention of the parties to preserve this Secondary Sublease and the interests in and to the Sublease Property created by this Secondary Sublease for the benefit of Sublessee without interruption.

F. District and Trunkline acknowledge and agree that Trunkline and Sublessor shall have the right to exercise their respective renewal options under the Primary Sublease and/or Restated Trunkline Lease with respect to the Sublease Property only so long as this Secondary Sublease remains in effect.

[Signatures appear on the following page]

IN WITNESS WHEREOF the undersigned parties have executed this Secondary Sublease as of the date first above written.

ATTEST:

By: _____

Name: _____

Title: _____

(SEAL)

ATTEST:

By: _____

Name: _____

Title: _____

(SEAL)

ATTEST:

By: _____

Name: _____

Title: _____

(SEAL)

ATTEST:

By: Todd Cooper

Name: Todd Cooper

Title: AGC

(SEAL)

SUBLESSOR:

BG LNG SERVICES, LLC

By: _____

Name: _____

Title: _____

SUBLESSEE:

MAGNOLIA LNG, LLC

By: _____

Name: _____

Title: _____

INTERVENOR:

LAKE CHARLES HARBOR & TERMINAL DISTRICT

By: _____

Name: _____

Title: _____

INTERVENOR:

TRUNKLINE LNG COMPANY, LLC

By: L.T. Stone

Name: L.T. STONE

Title: Sr. Vice President

Exhibit "A"

(Sublease Property)

Tract 2

THAT CERTAIN TRACT OR PARCEL OF LAND LYING IN THE NORTHWEST QUARTER (NW/4) OF SECTION 16, TOWNSHIP 11 SOUTH RANGE 9 WEST CALCASIEU PARISH, LOUISIANA, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS TO-WIT:

COMMENCING AT THE NORTHEAST CORNER OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, TOWNSHIP 11 SOUTH, RANGE 9 WEST, CALCASIEU PARISH, LOUISIANA;

THENCE SOUTH 00° 38' 59" WEST, ALONG THE EAST LINE OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, FOR A DISTANCE OF 1710.61 FEET;

THENCE NORTH 89° 23' 01" WEST, PERPENDICULAR TO THE EAST LINE OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, FOR A DISTANCE OF 3327.59 FEET, TO A POINT BEING NORTH 00° 21' 53" WEST FROM THE NORTHWEST CORNER OF AN EXISTING WATER FACILITY PLANT, THE SOUTHEAST CORNER AND THE POINT OF BEGINNING OF HEREIN DESCRIBED TRACT;

THENCE NORTH 89° 35' 15" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 141.51 FEET;

THENCE NORTH 76° 41' 29" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 51.15 FEET;

THENCE NORTH 31° 56' 30" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 61.15 FEET;

THENCE NORTH 00° 27' 52" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 224.23 FEET;

THENCE NORTH 00° 05' 52" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 213.55 FEET;

THENCE NORTH 01° 29' 39" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 256.72 FEET;

THENCE NORTH 02° 15' 14" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 100.03 FEET;

THENCE NORTH 82° 51' 44" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 100.00 FEET;

THENCE NORTH 00° 34' 11" WEST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 40.20 FEET;

THENCE NORTH 13° 39' 00" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 102.99 FEET;

THENCE NORTH 22° 49' 51" EAST, ALONG SAID TOE OF SLOPE, FOR A DISTANCE OF 74.59 FEET, TO THE TOP BANK OF THE CALCASIEU RIVER INDUSTRIAL CANAL, THE NORTHWEST CORNER OF THE HEREIN DESCRIBED TRACT;

THENCE MEANDERING ALONG SAID TOP BANK, IN A GENERAL DIRECTION OF SOUTH 81° 59' 48" EAST FOR A DISTANCE OF 99.68 FEET;

THENCE MEANDERING ALONG SAID TOP BANK, IN A GENERAL DIRECTION OF SOUTH 74° 51' 38" EAST FOR A DISTANCE OF 53.10 FEET;

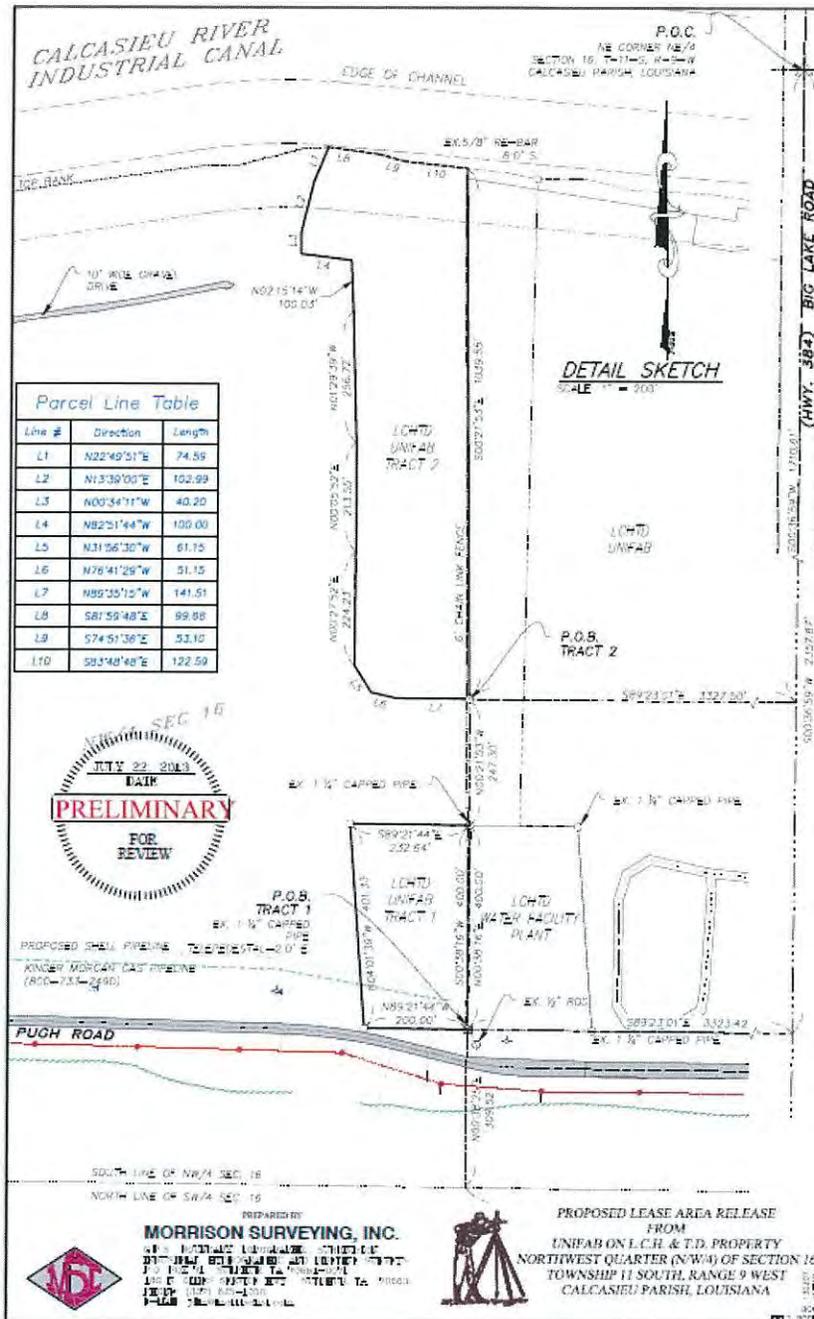
THENCE MEANDERING ALONG SAID TOP BANK, IN A GENERAL DIRECTION OF SOUTH 83° 48' 48" EAST FOR A DISTANCE OF 122.59 FEET;

THENCE SOUTH 00° 21' 53" EAST, FOR A DISTANCE OF 1039.55 FEET TO THE POINT OF BEGINNING.

HEREIN DESCRIBED TRACT CONTAINING 5.74 ACRES, MORE OR LESS.

[Exhibit "A"]

Exhibit "A-1"
(Sublease Property)



Appendix 1.C.3

Amendment to the Port District Option Agreement

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**FIRST AMENDMENT TO
REAL ESTATE LEASE OPTION AGREEMENT**

BE IT KNOWN, that on the dates hereinafter set forth, before the undersigned Notaries Public, duly commissioned and qualified in and for their respective State and County/Parish, and in the presence of the undersigned competent witnesses personally came and appeared:

MAGNOLIA LNG, LLC ("PROJECT COMPANY"), a Delaware limited liability company with its principal business office located at 5 Ord Street, West Perth, Western Australia 6005, and with its registered office in Louisiana at 5615 Corporate Blvd, Suite 400B, Baton Rouge, LA 70808, herein represented by its duly authorized undersigned representative; and

LAKE CHARLES HARBOR & TERMINAL DISTRICT ("DISTRICT"), a political subdivision of the State of Louisiana, herein represented by its duly authorized Executive Director, with its principal business office located in Calcasieu Parish, Louisiana at 751 Bayou Pines East, Suite P, Lake Charles, Louisiana 70601;

which hereinafter collectively declare that:

WITNESSETH:

WHEREAS, the DISTRICT and the PROJECT COMPANY are parties to that certain Real Estate Lease Option Agreement, dated as of March 6, 2013 (the "Option Agreement"), with respect to the "Project Site" as more particularly described on Exhibit 1 to the Option Agreement; and

WHEREAS, the parties desire to amend the Option Agreement in order to more particularly describe the "Project Site" as set forth below.

NOW, THEREFORE, in consideration of the above recitals and the mutual covenants hereinafter contained, the parties herein covenant and agree as follows:

AGREEMENT

1. **RECITALS.** The foregoing recital of facts is hereby incorporated herein to the same extent as if hereinafter fully set forth. Capitalized words and phrases used herein which are not defined herein but which are defined in the Option Agreement shall have the meanings ascribed thereto in the Option Agreement.

2. **PROJECT SITE.** Exhibit 1 to the Option Agreement is hereby deleted in its entirety, and Exhibit 1 attached to this Amendment is substituted in lieu thereof. All references in the Option Agreement and the Ground Lease to Exhibit 1 to the Option Agreement or to the Project Site shall be deemed to refer to the real property described on Exhibit 1 attached to this Amendment.

3. **MISCELLANEOUS.** Except as herein amended, the terms and provisions of the Option Agreement shall remain in full force and effect and unamended. In the event of any conflict between the terms of this Amendment and the terms of the Option Agreement, the terms of this Amendment shall prevail. This Amendment may be executed in multiple counterparts, each of which shall be an original and all of which together shall constitute one and the same agreement. It shall not be necessary that each party execute each counterpart, or that any one counterpart be executed by both parties, so long as each party executes at least one counterpart. This Amendment shall be binding upon and shall inure to the benefit of the parties hereto and their respective successors and assigns and shall be governed by the laws of the State of Louisiana.

[Signatures on Following Pages]

THUS DONE AND SIGNED by the DISTRICT at Lake Charles, Louisiana, in the presence of the undersigned competent witnesses and me, Notary, on this 21ST day of October, 2013.

WITNESSES:

LAKE CHARLES HARBOR &
TERMINAL DISTRICT

Michelle Bolen
Print Name: Michelle Bolen

By: William J. Rase III
William J. Rase, III, Executive Director

Tiffany Fournet
Print Name: Tiffany Fournet

10-18-13
Lee

Approved By:

[Signature]

Michael K. Dees, General Counsel

BEFORE ME: Sharon L. Edwards
Notary Public

My Commission expires:



SHARON L. EDWARDS
NOTARY PUBLIC NO. 6529
STATE OF LOUISIANA
PARISH OF CALCASIEU
MY COMMISSION IS FOR LIFE

THUS DONE AND SIGNED by MAGNOLIA LNG, LLC at Houston, Texas in the presence of the undersigned competent witnesses and me, Notary, on this 28th day of August, 2013.

WITNESSES:

MAGNOLIA LNG, LLC

A. L. VAN
Print Name: A. L. VANDEW

By: [Signature]
Name: Fletcher Maurice Brand
Title: Managing Director

Gia Vandew
Print Name: Gia Vandew

BEFORE ME: Mary E. Snitkin
Notary Public
My Commission expires: Apr 28, 2016

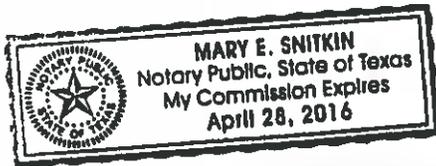


EXHIBIT 1

Legal Description of Project Site

THAT CERTAIN TRACT OR PARCEL OF LAND LYING IN THE NORTHWEST QUARTER (NW/4) OF SECTION 16 AND THE NORTHEAST QUARTER (NE/4) OF SECTION 17, ALL IN TOWNSHIP 11 SOUTH RANGE 9 WEST, CALCASIEU PARISH, LOUISIANA, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS TO-WIT:

COMMENCING AT THE NORTHEAST CORNER OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, TOWNSHIP 11 SOUTH, RANGE 9 WEST, CALCASIEU PARISH, LOUISIANA;

THENCE SOUTH $00^{\circ} 36' 59''$ WEST, ALONG THE EAST LINE OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, FOR A DISTANCE OF 2421.41 FEET;

THENCE NORTH $89^{\circ} 23' 01''$ WEST, PERPENDICULAR TO THE EAST LINE OF THE NORTHEAST QUARTER (NE/4) OF SAID SECTION 16, FOR A DISTANCE OF 3323.02 FEET TO A POINT IN THE CENTER OF HENRY PUGH ROAD, THE POINT OF BEGINNING OF HEREIN DESCRIBED TRACT;

THENCE NORTH $76^{\circ} 14' 23''$ WEST, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD, FOR A DISTANCE OF 146.52 FEET TO THE POINT OF CURVATURE OF A TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 1041.43 FEET AND A CENTRAL ANGLE OF $12^{\circ} 07' 47''$;

THENCE WESTERLY, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD AND SAID CURVE TO THE LEFT, FOR AN ARC LENGTH DISTANCE OF 220.47 FEET TO THE POINT OF TANGENT OF SAID CURVE;

THENCE NORTH $88^{\circ} 22' 09''$ WEST, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD, FOR A DISTANCE OF 1217.96 FEET TO THE POINT OF CURVATURE OF A TANGENT CURVE TO THE RIGHT HAVING A RADIUS OF 841.18 FEET AND A CENTRAL ANGLE OF $16^{\circ} 58' 53''$;

THENCE NORTHWESTERLY, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD AND SAID CURVE TO THE RIGHT, FOR AN ARC LENGTH DISTANCE OF 249.31 FEET TO THE POINT OF TANGENT OF SAID CURVE;

THENCE NORTH $71^{\circ} 23' 16''$ WEST, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD, FOR A DISTANCE OF 178.78 FEET TO THE POINT OF CURVATURE OF A TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 738.61 FEET AND A CENTRAL ANGLE OF $18^{\circ} 13' 31''$;

THENCE WESTERLY, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD AND SAID CURVE TO THE LEFT, FOR AN ARC LENGTH DISTANCE OF 234.95 FEET TO THE POINT OF TANGENT OF SAID CURVE;

THENCE NORTH $89^{\circ} 36' 48''$ WEST, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD, FOR A DISTANCE OF 296.54 FEET TO THE POINT OF CURVATURE OF A TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 452.23 FEET AND A CENTRAL ANGLE OF $26^{\circ} 53' 46''$;

THENCE SOUTHWESTERLY, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD AND SAID CURVE TO THE LEFT, FOR AN ARC LENGTH DISTANCE OF 212.29 FEET TO THE POINT OF TANGENT OF SAID CURVE;

THENCE SOUTH 63° 29' 26" WEST, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD, FOR A DISTANCE OF 119.45 FEET TO THE POINT OF CURVATURE OF A TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 423.73 FEET AND A CENTRAL ANGLE OF 27° 51' 58";

THENCE WESTERLY, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD AND SAID CURVE TO THE RIGHT, FOR AN ARC LENGTH DISTANCE OF 206.08 FEET TO THE POINT OF TANGENT OF SAID CURVE;

THENCE NORTH 88° 38' 36" WEST, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD, FOR A DISTANCE OF 404.62 FEET TO THE POINT OF CURVATURE OF A TANGENT CURVE TO THE RIGHT, HAVING A RADIUS OF 277.56 FEET AND A CENTRAL ANGLE OF 53° 00' 37";

THENCE NORTHWESTERLY, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD AND SAID CURVE TO THE RIGHT, FOR AN ARC LENGTH DISTANCE OF 256.80 FEET TO THE POINT OF TANGENT OF SAID CURVE;

THENCE NORTH 35° 37' 58" WEST, ALONG THE CENTERLINE OF SAID HENRY PUGH ROAD, FOR A DISTANCE OF 383.12 FEET;

THENCE NORTH 55° 04' 12" EAST, ALONG THE SOUTHERLY BOUNDARY LINE AND AN EXTENSION THEREOF OF PROPERTY FORMERLY OR CURRENTLY OWNED BY TALENS MARINE AND FUEL, FOR A DISTANCE OF 232.64 FEET TO AN EXISTING 5/8" ROD;

THENCE NORTH 18° 04' 32" EAST, ALONG SAID BOUNDARY LINE OF THE TALENS MARINE AND FUEL PROPERTY, FOR A DISTANCE OF 141.20 FEET TO AN EXISTING 5/8" ROD;

THENCE NORTH 53° 25' 06" EAST, ALONG SAID BOUNDARY LINE OF THE TALENS MARINE AND FUEL PROPERTY, FOR A DISTANCE OF 148.42 FEET TO AN EXISTING 5/8" ROD;

THENCE NORTH 39° 21' 56" WEST, ALONG THE EASTERLY LINE OF SAID TALENS MARINE AND FUEL PROPERTY, FOR A DISTANCE OF 52.32 FEET, MORE OR LESS, TO THE SOUTH BANK OF CALCASIEU RIVER INDUSTRIAL CANAL;

THENCE MEANDERING ALONG SAID CALCASIEU RIVER INDUSTRIAL CANAL, IN A GENERAL DIRECTION OF NORTH 89° 25' 34" EAST, FOR A DISTANCE OF 1493.33 FEET;

THENCE MEANDERING ALONG SAID CALCASIEU RIVER INDUSTRIAL CANAL, IN A GENERAL DIRECTION OF NORTH 81° 48' 24" EAST, FOR A DISTANCE OF 1758.57 FEET;

THENCE MEANDERING ALONG SAID CALCASIEU RIVER INDUSTRIAL CANAL, IN A GENERAL DIRECTION OF NORTH 78° 24' 29" EAST, FOR A DISTANCE OF 184.31 FEET TO THE NORTHEAST CORNER OF PROPERTY CURRENTLY OR FORMERLY OWNED BY LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.);

THENCE SOUTH 22° 49' 51" WEST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 74.59 FEET;

THENCE SOUTH 13° 39' 00" WEST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 109.99 FEET;

THENCE SOUTH 00° 34' 11" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 40.20 FEET;

THENCE SOUTH 82° 51' 44" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 100.00 FEET;

THENCE SOUTH 02° 15' 14" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 100.03 FEET;

THENCE SOUTH 01° 29' 39" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 256.72 FEET;

THENCE SOUTH 00° 05' 52" WEST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 213.55 FEET;

THENCE SOUTH 00° 27' 52" WEST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 224.23 FEET;

THENCE SOUTH 31° 56' 30" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 61.15 FEET;

THENCE SOUTH 76° 41' 29" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 51.15 FEET;

THENCE SOUTH 89° 35' 15" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 141.51 FEET;

THENCE SOUTH 00° 21' 53" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 247.30 FEET TO AN EXISTING 1 1/4" CAPPED PIPE;

THENCE NORTH 89° 21' 44" WEST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 232.64 FEET;

THENCE SOUTH 04° 01' 39" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 401.33 FEET;

THENCE SOUTH 89° 21' 44" EAST, ALONG THE WESTERLY BOUNDARY LINE OF SAID LAKE CHARLES HARBOR AND TERMINAL DISTRICT (UNIFAB INTERNATIONAL WEST, L.L.C.) PROPERTY, FOR A DISTANCE OF 200.00 FEET TO AN EXISTING 1 1/4" CAPPED PIPE MARKING THE SOUTHWEST CORNER OF THE LAKE CHARLES HARBOR AND TERMINAL DISTRICT WATER FACILITY PLANT;

THENCE SOUTH 00° 15' 28" WEST, FOR A DISTANCE OF 63.54 FEET TO THE POINT OF BEGINNING.

HEREIN DESCRIBED TRACT IS SUBJECT TO ROAD RIGHTS-OF-WAY ON THE SOUTH AND WEST SIDE THEREOF.

HEREIN DESCRIBED TRACT IS SUBJECT TO THE CALCASIEU RIVER INDUSTRIAL CANAL RIGHT-OF-WAY ON THE NORTH SIDE THEREOF.

HEREIN DESCRIBED TRACT CONTAINING 107.59 ACRES, MORE OR LESS.

TRACT-1

THAT CERTAIN TRACT OR PARCEL OF LAND LYING IN THE NORTH HALF OF SECTION 16, TOWNSHIP 11 SOUTH, RANGE 9 WEST, CALCASIEU PARISH, LOUISIANA, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS TO-WIT:

COMMENCING AT THE SOUTHEAST CORNER OF THE NORTHEAST QUARTER (NE/4) OF SECTION 16, TOWNSHIP 11 SOUTH, RANGE 9 WEST, CALCASIEU PARISH, LOUISIANA;

THENCE NORTH 89° 21' 35" WEST, ALONG THE SOUTH LINE OF SAID NORTHEAST QUARTER (NE/4), FOR A DISTANCE OF 3331.06 FEET;

THENCE NORTH 00° 38' 25" EAST, PERPENDICULAR TO SAID SOUTH LINE, FOR A DISTANCE OF 309.52 FEET TO AN EXISTING 1 1/4" CAPPED PIPE ON THE SOUTHWEST CORNER OF AN EXISTING WATER FACILITY PLANT, THE POINT OF BEGINNING AND SOUTHEAST CORNER OF HEREIN DESCRIBED TRACT;

THENCE NORTH 89° 21' 44" WEST, ALONG A WESTERLY EXTENSION OF THE SOUTH LINE OF SAID WATER FACILITY PLANT, FOR A DISTANCE OF 200.00 FEET, THE SOUTHWEST CORNER OF THE HEREIN DESCRIBED TRACT;

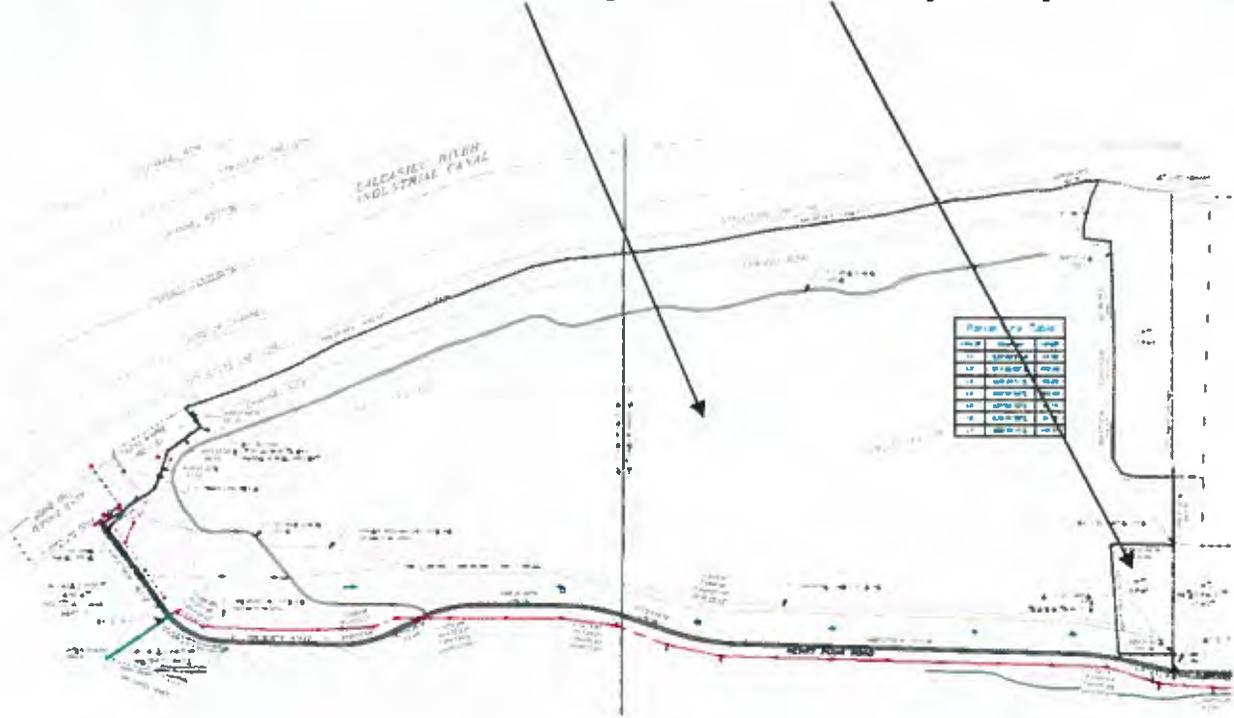
THENCE NORTH 04° 01' 39" WEST, FOR A DISTANCE OF 401.33 FEET TO THE INTERSECTION WITH A WESTERLY EXTENSION OF THE NORTH LINE OF SAID WATER FACILITY PLANT, THE NORTHWEST CORNER OF THE HEREIN DESCRIBED TRACT;

THENCE SOUTH 89° 21' 44" EAST, ALONG SAID EXTENSION, FOR A DISTANCE OF 232.64 FEET TO AN EXISTING 1 1/4" CAPPED PIPE ON THE NORTHWEST CORNER OF SAID WATER FACILITY PLANT, THE NORTHEAST CORNER OF THE HEREIN DESCRIBED TRACT;

THENCE SOUTH 00° 38' 16" WEST, ALONG THE WEST LINE OF THE AFORESAID WATER FACILITY PLANT, FOR A DISTANCE OF 400.00 FEET TO THE POINT OF BEGINNING.

HEREIN DESCRIBED TRACT CONTAINING 1.99 ACRES, MORE OR LESS.

The Project Site includes both the 107.59 acre parcel, and the 1.99 acre parcel depicted below:

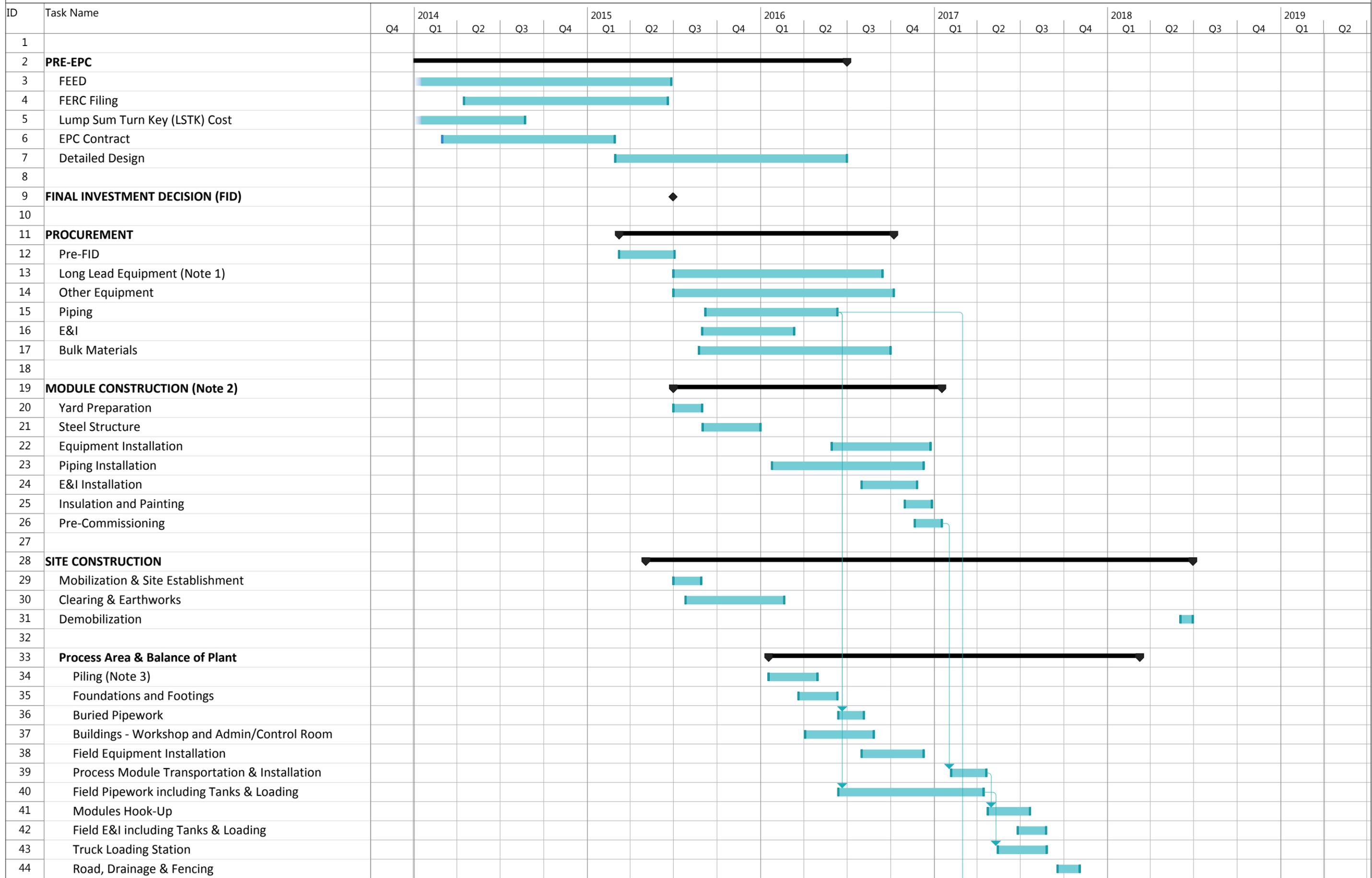


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Appendix 1.D
Project Schedule

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MAGNOLIA LNG PROJECT - CONSTRUCTION SCHEDULE



Appendix 1.E
Permits and Approvals for the Project

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Agency	Name of Plan/Permit/Authorization	Item No.	Correspondence Description or Status Summary
A. Federal			
A.1 Federal Energy Regulatory Commission (FERC)	Authorizations under Section 3(a) of the Natural Gas Act	A.1a	Magnolia was granted approval to utilize FERC's National Environmental Policy Act (NEPA) Pre-Filing review process <ul style="list-style-type: none"> ▪ Resource Reports (RRs) filed in November 2013. ▪ Filing of formal application anticipated in 2014.
A.2 U.S. Army Corps of Engineers (USACE) New Orleans District USACE and Louisiana Department of Environmental Quality (LDEQ), Water Permits Division	NEPA Pre-Filing consultation	A.2a	Initiated December 19, 2012.
	Clean Water Act (CWA) (Section 404) Rivers and Harbors Act (Section 10) Permit (Dredge and Fill Permit)	A.2b	Results of soil and sediment chemical sampling program per USACE approved plan submitted to USACE New Orleans, Operations Division on October 29, 2013. This Dredge Area Sampling Summary Report for the Magnolia LNG Berth Area also was provided as Appendix 2.A in RR2 in the November 2013 RR submittal.
		A.2c	Response received November 7, 2013.
	Wetland Mitigation Plan	NA	<ul style="list-style-type: none"> ▪ Section 10/404 permit application anticipated to be submitted March 31, 2014. ▪ In response to FERC comments on the November 2013 RR submittal, the wetland mitigation plan referenced in Section 2.3.2 of RR 2 will be provided in the final formal application to be filed in 2014.
		A.2d	Request for preliminary jurisdiction determination sent on January 30, 2014.
	Dredging Report	NA	<ul style="list-style-type: none"> ▪ Magnolia LNG Dredging Report (dated November 11, 2013), was provided as Appendix I.2 in RR 13 submitted in November 2013. The plan will be reviewed based on FERC comments, revised as necessary, and resubmitted in the final formal application to be filed 2014.
A.3 Advisory Council on Historic Preservation (ACHP)	Section 106, National Historic Preservation Act (NHPA) Consultation	see B.2a	Consultation initiated with the Louisiana State Historic Preservation Officer on August 28, 2013. See Item B.2.
see B.2b		Response received dated October 28, 2013. See Item B.2.	

Agency		Name of Plan/Permit/Authorization	Item No.	Correspondence Description or Status Summary
A.4	Native American Tribes	Section 106, NHPA Consultation	A.4a	Consultation initiated on January 17, 2014, with the Alabama Coushatta Tribe of Texas.
			A.4b	Consultation initiated on January 17, 2014, with the Caddo Nation.
			A.4c	Consultation initiated on January 17, 2014, with the Coushatta Tribe of Louisiana.
			A.4d	Enclosures that accompanied each of the letters above.
A.5	U.S. Coast Guard (USCG), Marine Safety Unit (MSU), Lake Charles, Louisiana	NEPA Pre-Filing consultation	A.5a	Initiated December 19, 2012.
		Letter of Intent (LOI) Submission (33 CFR 127.007)	NA	<ul style="list-style-type: none"> LOI process initiated January 2013.
		Waterway Suitability Assessment (WSA) consultation	NA	<ul style="list-style-type: none"> Preliminary WSA submitted to USCG Captain of the Port, Port Arthur, on March 12, 2013, along with LOI required by 33 CFR 127.007. Follow on WSA submitted in final form on November 22, 2013 (Confidential-Copy is not included)
		Letter of Recommendation from the USCG	NA	<ul style="list-style-type: none"> Pending
A.6	U.S. Department of the Interior, U.S. Fish and Wildlife Service (USFWS)	NEPA Pre-Filing consultation	A.6a	Initiated on December 19, 2012
		Endangered Species Act (ESA) Section 7 consultation	A.6b	Conference call on August 26, 2013, to discuss species of concern and evaluation of impacts.
		Fish and Wildlife Coordination Act	A.6c	Consultations initiated August 30, 2013.
		Migratory Bird Treaty Act	A.6d	Response received September 27, 2013, indicating that the Project will have 'no effect' on federally listed species and on migratory birds.
			A.6e	Conference call on February 3, 2014, to address FERC's concerns; the USFWS confirmed their previous response.
A.7	National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NOAA Fisheries Service), Habitat Conservation Division	NEPA Pre-Filing consultation	A.7a	Initiated December 19, 2012.
		ESA Section 7 consultation	A.7b	Consultations initiated August 30, 2013.
		Magnuson-Stevens Fishery Management Act Essential Fish Habitat (EFH) consultation	A.7c	Teleconferences on August 17 and October 17, 2013 (Contact Report) with October 17, 2013, meeting indicating that no further consultation would be needed, as no NOAA-managed species or EFH would be affected.
A.8	United States Environmental Protection Agency (USEPA)	Guidelines for Specification of Disposal Sites for Dredged or Fill Material (CFR 40 Part 230)	A.8a	Letter from USEPA to Louisiana Department of Natural Resources, dated January 18, 2013, in response to request for pre-application review.

Agency	Name of Plan/Permit/Authorization	Item No.	Correspondence Description or Status Summary	
B. State				
B.1	Louisiana Department of Environmental Quality (LDEQ)	NEPA Pre-Filing consultation	B.1a	Initiated December 19, 2012.
	LDEQ, Water Permits Division	General Permit for Large Construction Site Construction Stormwater - Notice of Intent	NA	<ul style="list-style-type: none"> No draft permit to be submitted with FERC application. The Project may be exempt from the construction stormwater permit. Magnolia LNG to discuss with LDEQ.
		General Permit for Discharges of Hydrostatic Test Water	NA	<ul style="list-style-type: none"> No draft permit to be submitted with the FERC application, but will be filed with the FERC after the application is submitted. Magnolia LNG intends to operate under the provisions of the general permit and meet the requirements.
		Site-specific Stormwater Pollution Prevention Plan (SWPPP)	NA	<ul style="list-style-type: none"> E & E to prepare "Generic" Construction SWPPP for LDEQ General Permit for Large Construction Site Construction Stormwater –NOI. Plan should be marked "Draft" and should incorporate appropriate components of the FERC "Plans and Procedures" submitted as part of RR2. Magnolia to initiate coordination with the LDEQ relating to development of a site-specific SWPPP that would be implemented during construction and operation of the Project.
		CWA Section 401 Water Quality Certification	see A.2c	<ul style="list-style-type: none"> LDEQ review is concurrent with USACE Section 10/404 Permit. Jeff Corbino of USACE did a water quality review of Magnolia's soil/sediment sampling report results report and found that the dredging effluent would meet federal and state water quality standards. See Item A.2.
		CWA LPDES Permit Application for Surface Water Discharge (Industrial Operating Stormwater Permit Application)	NA	<ul style="list-style-type: none"> No draft permit to be submitted with the FERC application, but will be filed with the FERC after the application is submitted.
		CWA LPDES Permit Application for Industrial Wastewater	NA	<ul style="list-style-type: none"> No draft permit to be submitted with the FERC application, but will be filed with the FERC after the application is submitted.

Agency		Name of Plan/Permit/Authorization	Item No.	Correspondence Description or Status Summary
B.1	LDEQ, Water Permits Division	CWA LPDES Permit Application for Sanitary Wastewater	NA	<ul style="list-style-type: none"> No draft permit to be submitted with the FERC application, but will be filed with the FERC after the application is submitted.
		Spill Prevention Plan (SPP)	NA	<ul style="list-style-type: none"> Draft Construction SPP will be included with the LDEQ General Permit for Large Construction Site Construction Stormwater – NOI.
	LDEQ, Water Permits Division, and the USACE	Dredging Report	NA	<ul style="list-style-type: none"> Magnolia LNG Dredging Report (dated November 11, 2013), was provided as Appendix I.2 in RR 13 submitted in November 2013. The plan will be reviewed based on FERC comments, revised as necessary, and resubmitted in the formal application anticipated in 2014.
	LDEQ, Air Permits Division	Air Quality Permit, New Source Review, Prevention of Significant Deterioration Permit, Title V Operations Permit	NA	<ul style="list-style-type: none"> Consultation initiated January 2013.
			B.1b	Air emissions dispersion modeling protocol submitted to the LDEQ on January 16, 2014.
			B.1c	Response and approval of protocol received January 22, 2014.
	IT Questionnaire	NA	<ul style="list-style-type: none"> Initiated January 2014 	
B.2	Louisiana State Historic Preservation Officer (LA SHPO)	NHPA Section 106 consultation	B.2a	Consultation initiated August 28, 2013 requesting a) concurrence with definition of the APE, and b) comments on the need for and scope of any necessary investigations.
			B.2b	Response received October 28, 2013, indicating concurrence with the APE and no need for further investigation.
		Unanticipated Discovery Plan (UDP)	B.2c	Draft UDP provided on October 21, 2013 (see RR4, Appendix 4.C).
			B.2e	Telephone follow-up on LA SHPO review of UDP on January 22, 2014.
			B.2e	Additional copy of UDP provided electronically per LA SHPO request on February 10, 2014.
			B.2f	Response dated February 10, 2014, received, indicating no objection to UDP.

	Agency	Name of Plan/Permit/Authorization	Item No.	Correspondence Description or Status Summary	
B.3	Louisiana Department of Natural Resources (LDNR), Office of Coastal Management	NEPA Pre-Filing consultation	B.3a	Initiated on December 19, 2012.	
	LDNR, Office of Conservation	NEPA Pre-Filing consultation	B.3b	Initiated on December 19, 2012.	
			B.3c	Response dated January 14, 2013, received, offering assistance with information, but declining invitation to participate in the NEPA Pre-Filing process.	
		Surface water withdrawal permit	NA	<ul style="list-style-type: none"> ▪ Permit would be contingent on the Project's raw water source and surface water withdrawal demand. No draft permit to be submitted with FERC application. 	
	LDNR, Permits and Mitigation Division	Application for construction of natural gas facilities and approval to interconnect to existing pipelines	NA	<ul style="list-style-type: none"> ▪ Preliminary coordination determined that no permit application is required. 	
			Coastal Use Permit (CUP) application, including Coastal Zone Management Act	B.3d	Solicitation of Views letter submitted October 15, 2013, requesting concurrence of CZM jurisdiction.
			Coastal Zone Management (CZM) Consistency	B.3e	Completeness letter dated October 17, 2014, received.
B.3f	Response dated October 29, 2013, received. Pursuant to LA R.S. 49:214.25.E, a CUP will not be required.				
B.4	Louisiana Department of Wildlife and Fisheries (LDWF)	NEPA Pre-Filing consultation	B.4a	Initiated December 19, 2012.	
		State-Protected Species and Fisheries consultation	B.4b	Consultation initiated September 4, 2013.	
		Resource Reports	B.4c	Response received September 13, 2013, stating that the Project will not affect state-listed sensitive species or their critical habitat.	
			B.4d	LDWF provided details on proposed Fisheries Research Center via email, July 24, 2013.	
			B.4e	Comments from LDWF on RR11 received on January 9, 2014.	
			B.4f	Meeting regarding Fisheries Research Center and follow-up to January 9, 2014 letter, on February 6, 2014 (see meeting minutes)	
		B.4g	Responses to LDWF's comments on RR11 submitted on February 14, 2014.		

Agency		Name of Plan/Permit/Authorization	Item No.	Correspondence Description or Status Summary
C. Local				
C.1	Calcasieu Historical Preservation Society	Section 106 consultation	C.1a	Initiated October 17, 2013.
			C.1b	Follow-up November 2013 through January 2014 (Contact Report).
			C.1c	Follow-up email on February 3, 2014.
			C.1d	Response received February 3, 2014.
C.2	Calcasieu Parish Administrator and Calcasieu Parish Policy Jury	Section 106 consultation	C.2a	Initiated October 17, 2013.
			C.2b	Response dated October 25, 2013.
		Floodplain Development Authorization Permit	NA	<ul style="list-style-type: none"> ▪ No draft permit to be submitted with FERC application. Responsibility of EPC Contractor.
	Building Permits	NA	<ul style="list-style-type: none"> ▪ No draft permit to be submitted with FERC application. Responsibility of EPC Contractor 	
C.3	Frazer Memorial Library	Section 106 consultation	C.3a	Initiated October 17, 2013.
			C.3b	Response received November 1, 2013.

Appendix 1.F
List of Landowners for the Project
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Appendix 1.G
Federal, State, Local, Business, and Other Stakeholders

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Federal Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE
3rd Congressional District	U. S. Representative	Rep.	Charles W.	Boustany, Jr	P. O. Box 80126	Lafayette	LA	70598	337-261-0041
Federal Energy Regulatory Commission (FERC)	Director of Gas, Environment & Engineering Office		Lauren H.	O'Donnell	888 First Street, N.E.	Washington	DC	20426	(202) 502-8325
U.S. Army Corps of Engineers (USACE)	Chief, Regulatory Branch		Martin	Mayer	Post Office Box 60267	New Orleans	LA	70160-267	504-862-2276
U.S. Coast Guard		Lt.	Jennifer	Andrews	127 W. Broad Street, Suite 200	Lake Charles	LA	70601-5680	
U.S. Coast Guard		Lt.	Will	Fediw	127 W. Broad Street, Suite 200	Lake Charles	LA	70601-5680	
U.S. Coast Guard			Leon	McClain	127 W. Broad Street, Suite 200	Lake Charles	LA	70601-5680	(337) 721-5750
U.S. Coast Guard		Lt.	Tom	Moore'	127 W. Broad Street, Suite 200	Lake Charles	LA	70601-5680	(337) 491-7804
U.S. Coast Guard	Chief	Lt.	Anthony	Walter	127 W. Broad Street, Suite 200	Lake Charles	LA	70601-5680	(337) 721-5764
U.S. Coast Guard, Dept. of Homeland Security (USCG)	Captain of the Port, Port Arthur, TX	Capt.	George (Joe)	Paitl	2875 Jimmy Johnson Blvd	Port Arthur	TX	77640-2002	
U.S. Coast Guard, Marine Safety Unit Lake Charles	Commanding Officer	Cmdr.	Will E.	Watson	127 W. Broad Street, Suite 200	Lake Charles	LA	70601-5680	(337) 491-7800
U.S. Coast Guard, Prevention Dept.			Clint	Smith	127 W. Broad Street, Suite 200	Lake Charles	LA	70601-5680	337-491-7804
U.S. Department of Energy, Office of Fossil Energy (DOE)	Manager, Natural Gas Regulatory Activities		John A.	Anderson	P.O. Box 44375	Washington	DC	20026-4375	(202) 586-0521
U.S. Dept of Commerce	Team Leader		Richard	Hartman	% LSU S.Stadium Road, Rm #266	Baton Rouge	LA	70803	(225) 389-0508
U.S. Environmental Protection Agency (EPA) Region 6	Consultant		Raul	Gutierrez, Ph.D.	1445 Ross Ave., Suite 1200	Dallas, Texas 75202	TX	75202	214-665-6697
U.S. Fish & Wildlife Service (FWS)	Endangered Species Coordinator		Josh	Marceaux	646 Cajundome Blvd	Lafayette	LA	70506	(337) 291-3110
U.S. Senate	U. S. Senator	Sen.	Mary	Landrieu	500 Poydras St., Rm. 105	New Orleans	LA	70130	504-589-2427
U.S. Senate	U. S. Senator	Sen.	David	Vitter	238 Helios Ave.	Metairie	LA	70005	504-835-6993

State Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	EMAIL	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE
Coastal Protection and Restoration Authority			Garret	Graves		1051 N 3rd St., Ste 138	Baton Rouge	LA	70802	225-342-7308
Governor's Office of Homeland Security & Emergency Preparedness			Kevin	Davis		7667 Independence Blvd	Baton Rouge	LA	70806	
House Speaker	36th Representative District	Rep.	Chuck	Kleckley	larep036@legis.state.la.us	130 Jamestown Road	Lake Charles	LA	70605	337-474-5248
Louisiana Department of Environmental Quality			Peggy	Hatch		PO Box 4301	Baton Rouge	LA	70821-4301	225-765-2800
Louisiana Department of Environmental Quality	Air Permits	Mr.	Bryan	Johnston		P.O. Box 4313	Baton Rouge	LA	80821-4313	225-219-3417
Louisiana Department of Environmental Quality	Spec Assist to the Secretary	Mr.	Paul	Miller		P.O. Box 4301	Baton Rouge	LA	70821-4301	225-219-3953
Louisiana Department of Environmental Quality	Water Permitting		Jamie	Phillippe		P.O. Box 4313	Baton Rouge	LA	80821-4313	225-219-9371
Louisiana Department of Environmental Quality	Staff Attorney		Alex	Prochaska		P.O. Box 4302	Baton Rouge	LA	70821-4302	225-219-3985
Louisiana Department of Environmental Quality	Under Secretary	Mr.	Vince	Sagnibene		P.O. Box 4301	Baton Rouge	LA	70821-4301	225-219-3953
Louisiana Department of Environmental Quality	Water Permitting	Ms.	Jennifer	Sheppard		P.O. Box 4313	Baton Rouge	LA	80821-4313	225-219-9371
Louisiana Department of Environmental Quality	Air Quality Supervisor		Tegan	Treadaway	Tegan.Treadaway@LA.GO	P.O. Box 4313	Baton Rouge	LA	70821-4313	
Louisiana Department of Environmental Quality SW Region	Regional Manager		Billy	Eakin		1301 Gadwall	Lake Charles	LA	70615	33-7491-2667
Louisiana Department of Natural Resources	Secretary	Secy.	Stephen	Chustz		PO Box 94396	Baton Rouge	LA	70804-9396	
Louisiana Department of Natural Resources	Director, Pipeline Division	Mr.	James	Mergist		P.O. Box 94275	Baton Rouge	LA	70804-9275	225-342-5585
Louisiana Department of Natural Resources, Coastal Resources	Scientist Manager Mitigation		Kelley	Templet	kelley.templet@la.gov				225-342-3124	225-342-3124
Louisiana Department of Natural Resources, Coastal Resources	Scientist, Permits West	Ms.	Jessica	Williamson	jessica.williamson@la.gov					225-342-7942
Louisiana Department of Natural Resources, Office of Coastal Management	Coastal Resources Scientist Manager - Permits	Ms.	Christine	Charrier	christine.charrier@la.gov					225-342-7953
Louisiana Department of Natural Resources, Office of Coastal Management	Administrator, Permits and Mitigation Division	Mr.	Karl	Morgan		P.O. Box 44487	Baton Rouge	LA	70802	
Louisiana Department of Natural Resources, Office of Coastal Restoration and Management	Scientist, Permits East	Mr.	Ontario	James	ontario.james@la.gov	P.O. Box 44487	Baton Rouge	LA	70804-4487	225-342-7358
Louisiana Department of Natural Resources, Office of Conservation	Engineering Regulatory Division	Mr.	Brent	Campbell	brent.campbell@la.gov					225-342-4505
Louisiana Department of Natural Resources, Office of Conservation	Assistant Commissioner	Mr.	Gary	Ross		P.O. Box 94275	Baton Rouge	LA	70804-9275	
Louisiana Department of Transportation	Egineer Administrator		Steve	Jiles		PO Box 1430	Lake Charles	LA	70602	337-437-9101
Louisiana Department of Transportation	Chief, Project Development Division		Janice	Williams P.E.		PO Box 94245	Baton Rouge	LA	70804	225-379-1502
Louisiana Department of Wildlife & Fisheries	Secretary	Secy.	Robert	Barham		PO Box 98000	Baton Rouge	LA	70898	
Louisiana Department of Wildlife and Fisheries	Assistant Secretary	Mr.	Jimmy	Anthony		P.O. Box 98000	Baton Rouge	LA	70898	
Louisiana Department of Wildlife and Fisheries	Coordinator, Natural Heritage Program	Ms.	Amity	Bass		P.O. Box 98000	Baton Rouge	LA	70898	225-765-2800
Louisiana Department of Wildlife and Fisheries	Permit Coordinator	Mr.	Dave	Butler	dbutler@wf.la.gov					225-763-3595
Louisiana Department of Wildlife and Fisheries	Biologist		Chris	Davis	rcdavis@wf.la.gov					225-765-2642
Louisiana Department of Wildlife and Fisheries	Biologist Director - Fisheries Extension	Mr.	Jason	Duet	jdnet@wf.la.gov	P.O. Box 98000	Baton Rouge	LA	70898	
Louisiana Department of Wildlife and Fisheries	Biologist	Mr.	Craig	Gothreaux	cgothreaux@wf.la.gov					
Louisiana Department of Wildlife and Fisheries	Biologist	Mr.	Ian	MaeKinnan		1213 North Lakeshore Drive	Lake Charles	LA	70601	337-491-2575
Louisiana Department of Wildlife and Fisheries	Louisiana Natural Heritage Program	Ms.	Carolyn	Michon		P.O. Box 98000, 2000 Quail Drive	Baton Rouge	LA	70898	
Louisiana Department of Wildlife and Fisheries	Assistant Secretary	Mr.	Randall	Pausina	rpausina@wf.la.gov	PO Box 98000	Baton Rouge	LA	70898	225-765-2801
Louisiana Dept of Environmental Quality	Waste Permits Division	Asst. Secy.	Sanford	Phillips		P.O. Box 4313	Baton Rouge	LA	70821-4302	(225) 219-3972
Louisiana Dept of Natural Resources	Administrator		Karl	Morgan		P.O. Box 44487	Baton Rouge	LA	70804-4487	225-342-6740
Louisiana Dept of Wildlife & Fisheries	Biologist Program Manager		Kyle	Balkum		P.O. Box 98000	Baton Rouge	LA	70808	(225) 765-2819
Louisiana Dept. Of Conservation	Commissioner	Commissioner	Jim	Welsh		PO Box 94396	Baton Rouge	LA	70804	
Louisiana Dept. Of Culture, Recreation & Tourism	State Archaeologist and Director	Dr.	Charles	McGimsey		P.O. Box 44247	Baton Rouge	LA	70804	(225) 219-4598
Louisiana Dept. of Transportation & Development	Secretary	Secy.	Sherr	Lebas		PO Box 94245	Baton Rouge	LA	70804	225-379-1200
Louisiana Dept. of Transportation and Development	District 7 (Lake Charles) Engineer Administrator	Mr.	Steve	Jiles						
Louisiana Dept. of Transportation and Development	Secretary	Ms.	Sherr	LeBas		1201 Capitol Access Road	Baton Rouge	LA	70802	225-379-1232
Louisiana Dept. of Transportation and Development	Chief, Project Development Division	Ms.	Janice	Williams	janice.p.williams@la.gov	1201 Capitol Access Road	Baton Rouge	LA	70802	225-379-1502
Louisiana Dept. of Transportation and Development	Confidential Assistant to the Secretary		Shawn	Wilson	shawn.wilson@la.gov	1201 Capitol Access Road	Baton Rouge	LA	70802	225-379-2555
Louisiana Economic Development	Business Incentive Services	Mr.	Frank	Favaloro		1051 North Third Street	Baton Rouge	LA	70802-5239	225-342-3000
Louisiana Economic Development	Secretary	Secy.	Stephen	Moret		1051 North Third St	Baton Rouge	LA	70802	225-342-3000
Louisiana Economic Development	Senior Director of Business Development		Don	Pierson		1051 North Third St	Baton Rouge	LA	70802	
Louisiana Economic Development	Director, International Commerce	Mr.	John	Voorhorst		1051 North Third Street	Baton Rouge	LA	70802-5239	225-342-3000
Louisiana Economic Development	Senior Business Development Manager	Mr.	Rick	Ward		1051 North Third Street	Baton Rouge	LA	70802-5239	225-342-3000
Louisiana Office of Cultural Development	State Historic Preservation Officer	Ms.	Pam	Breaux		P.O. Box 44247	Baton Rouge	LA	70804-44247	
Louisiana State Police	Superintendent	Col.	Mike	Edmonson		7919 Independence Blvd	Baton Rouge	LA	70807	
National Marine Fisheries Service, Southeast Regional Office	SERO Section 6 Coordinator - ESA Biologist	Ms.	Karla	Reece		263 13th Avenue, S.	St. Petersburg	FL	33701	727-824-5348
State of Louisiana	Attorney General	Attn. Gen.	James D. 'Buddy'	Caldwell		96 Marianna	Tallulah	LA	71282	318-574-4771
State of Louisiana	Lieutenant Governor	LI. Gov.	'Jay'	Dardenne		8855 Brookwood Dr.	Baton Rouge	LA	70809	225-663-8933
State of Louisiana	Governor	Gov.	'Bobby'	Jindal		1001 Capitol Access Rd.	Baton Rouge	LA	70802	225-389-1180
State of Louisiana	Secretary of State	Secy. of State	'Tom'	Schedler		7211 Brookwood Dr.	Mandeville	LA	70471	985-626-9038
State of Louisiana	Department of Agriculture and Forestry	Commissioner	Michael G. 'Mike'	Strain		19607 Hwy. 36	Covington	LA	70433	225-922-1234
State Representative	33rd Representative District	Rep.	Mike	Danahay	danahaym@legis.state.la.us	1625 Beglis Parkway	Sulphur	LA	70663	
State Representative	34th Representative District	Rep.	A.B.	Franklin	franklina@legis.la.gov	2808 East Broad St	Lake Charles	LA	70615	337-439-2897
State Representative	35th Representative District	Rep.	Brett	Geymann	larep035@legis.state.la.us	P O Box 12703	Lake Charles	LA	70612	337-491-2315

State Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	EMAIL	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE
State Representative	37th Representative District	Rep.	John	Guinn	guinnj@legis.la.gov	P.O. Box 287	Jennings	LA	70546	
State Representative	47th Representative District	Rep.	Bob	Hensgens	hengensb@legis.la.gov	407 Charity Street	Abbeville	LA	70510	
State Representative	32nd Representative District	Rep.	Dorothy Sue	Hill	hild@legis.la.gov	529 Tramel Road	Dry Creek	LA	70637	
State Senator	27th Senatorial District	Sen.	Ronnie	Johns	johnsr@legis.la.gov	1011 Lakeshore Drive, Ste 515	Lake Charles	LA	70601	
State Senator	25th Senatorial District	Sen.	Dan "Blade"	Morrish	morrishd@legis.state.la.us	119 W. Nazpique St	Jennings	LA	70546	337-477-7754
State Senator	30th Senatorial District	Sen.	John	Smith	smithj@legis.la.gov	611-B South 5th Street	Leesville	LA	71446	
U.S. Army Corps of Engineers		Mr.	Jeffrey	Corbino	Jeffrey.M.Corbino@usace.army.mil					
U.S. Army Corps of Engineers		Mr.	James	Little, Jr.						
U.S. Army Corps of Engineers, New Orleans District	Chief, Western Evaluation Section (CEMVN-OD-S)	Mr.	Ronnie	Duke		P.O. Box 60267	New Orleans	LA	70160-0267	
U.S. Coast Guard	Attorney/Advisor	Mr.	Curtis	Borland						
U.S. Coast Guard Cargo and Facilities Division (CG-FAC-2)	Chief	Commander	Jeffrey	Morgan		2703 Martin Luther King Ave SE STOP 7501	Washington	DC	20593-7501	202-372-1171
U.S. Coast Guard Deepwater Standards Division (CG-OES-4)		Mr.	Mark	Prescott		2703 Martin Luther King Ave SE	Washington	DC	20593-7509	202-372-1401
U.S. Coast Guard Deepwater Standards Division (CG-OES-4)		Mr.	Kevin	Tone		2703 Martin Luther King Ave SE	Washington	DC	20593-7509	202-372-1401
U.S. Coast Guard Office of Port and Facility Compliance - Safety Branch	Master Mariner-Civilian	Captain	David	Condino		2703 Martin Luther King Ave SE STOP 7501	Washington	DC	20593-7501	202-372-1145
U.S. Coast Guard Office of Port and Facility Compliance (CG-FAC)	Chief	Captain	Andrew	Tucci		2703 Martin Luther King Ave SE STOP 7501	Washington	DC	20593-7501	202-372-1080
U.S. Department of Energy	Director, Oil and Gas Security	Mr.	Bob	Corbin	Robert.corbin@hq.doe.gov					202-586-9460
U.S. Environmental Protection Agency	Associate Director, Compliance Assurance and Enforcement Division	Ms.	Debra	Griffin		1445 Ross Avenue, Suite 1200	Dallas	TX	75202-2733	

Local Officials and Tribes - Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	EMAIL	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE
Adai Caddo	Chief		Rufus	Davis		4500 Highway 485	Robeline	LA	71469	
Alabama Coushatta Tribe of Texas	Chairman		Kyle	Williams		371 State Park Road 35	Livingston	TX	77351	
Associated Builders and Contractors	Director, Education and Training		Kirby	Bruchhaus		222 Walcott Road	Westlake	LA	70669	
Bayou Lafourche Band	Chairman		Randy	Verdun		PO Box 856	Zachary	LA	70791	
Caddo Nation	THPO		Robert	Cast		PO Box 487	Binger	OK	73009	
Caddo Nation	Chairman		Brenda	Shernayne Edwards		PO Box 487	Binger	OK	73009	
Calcasieu Parish	Assessor		Wendy Curphy	Aguillard		1030 Holly St.	Lake Charles	LA	70601	
Calcasieu Parish	Clerk of Court	Clerk of Court	Lynn	Jones		P.O. Box 1030	Lake Charles	LA	70602	
Calcasieu Parish	Coroner	Dr.	Terry	Welke		2715 Bocage St.	Lake Charles	LA	70605	
Calcasieu Parish District Attorney	District Attorney		John	DeRosier	hcarter@cpdao.com	P.O. Box 3206	Lake Charles	LA	70602	
Calcasieu Parish Homeland Security and Emergency Preparedness	Operations Mgr		Norman	Bourceau Jr		PO Drawer 3287	Lake Charles	LA	70602	
Calcasieu Parish Homeland Security and Emergency Preparedness	Director		Dick	Gremillion	dgregillion@cppj.net	901 Lakeshore Dr., Suite 200	Lake Charles	LA	70601	
Calcasieu Parish Police Jury	Police Juror District 13		Francis	Andrepont		1302 Fatima	Sulphur	LA	70663	
Calcasieu Parish Police Jury	Administator		Bryan	Beam	bbeam@cppj.net	P.O. Box 1583	Lake Charles	LA	70602	
Calcasieu Parish Police Jury	Assistant Administrator		Dane	Bolin	dbolin@cppj.net	P.O. Box 1583	Lake Charles	LA	70602	
Calcasieu Parish Police Jury	Police Juror District 8		'Guy'	Brame		1908 Linden Ln.	Lake Charles	LA	70605	
Calcasieu Parish Police Jury	Planning and Zoning Director		Wes	Crain	wrcrain@cppj.net	P.O. Box 1583	Lake Charles	LA	70602	
Calcasieu Parish Police Jury	Police Juror District 15		Les	Farnum		312 Oakley Dr.	Sulphur	LA	70663	
Calcasieu Parish Police Jury	Police Juror District 3		Elizabeth Conway	Griffin		903 N. Jake St.	Lake Charles	LA	70601	
Calcasieu Parish Police Jury	Police Juror District 9		Kevin	Guidry		4045 Briarfield St.	Lake Charles	LA	70607	
Calcasieu Parish Police Jury	Police Juror District 5		Nicholas 'Nic'	Hunter		810 Holly St.	Lake Charles	LA	70601	
Calcasieu Parish Police Jury	Police Juror District 2		James	Mayo		1800 N. Goos Blvd.	Lake Charles	LA	70601	
Calcasieu Parish Police Jury	President		Dennis Ray	Scott		5733 Bennie Ln.	Lake Charles	LA	70605	
Calcasieu Parish Police Jury	Police Juror District 1		Shannon	Spell		2296 Pinon Dr.	Lake Charles	LA	70611	
Calcasieu Parish Police Jury	Police Juror District 10		Tony	Stelly		P O Box 439	Iowa	LA	70647	
Calcasieu Parish Police Jury	Police Juror District 12		Ray	Taylor		2300 Currie Dr.	Sulphur	LA	70665	
Calcasieu Parish Police Jury	Police Juror District 11		Sandy	Treme		920 North Overton St.	DeQuincy	LA	70633	
Calcasieu Parish Police Jury	Police Juror District 4		Tony	Guillory		128 Kingsley	Lake Charles	LA	70601	
Calcasieu Parish Police Jury	Police Juror District 7		Chris	Landry		4336 Oaklawn Dr.	Lake Charles	LA	70605	
Calcasieu Parish Police Jury	Police Juror District 14		Hal	McMillin	hal.mcmillin@levingston.com	1423 Beech St.	Westlake	LA	70669	
Calcasieu Parish School Board	District 4		Annette	Ballard		2460 Talouse Ln.	Lake Charles	LA	70605	
Calcasieu Parish School Board	District 5		Dale	Bernard		1028 Iberville St.	Lake Charles	LA	70607	
Calcasieu Parish School Board	District 7		Mack	Dellafosse, Jr.		1917 19th St.	Lake Charles	LA	70601	
Calcasieu Parish School Board	District 3		Clara F.	Duhon		614 Oleo St.	Lake Charles	LA	70601	
Calcasieu Parish School Board	District 2		Fred	Hardy		2824 Dona Teil St.	Lake Charles	LA	70615	
Calcasieu Parish School Board	District 6		'Bill'	Jongbloed		2505 Karen Ln.	Lake Charles	LA	70605	
Calcasieu Parish School Board	District 15		Bryan	Larocque		1814 Hollow Cove Ln.	Lake Charles	LA	70611	
Calcasieu Parish School Board	Superintendent	Supt.	Wayne	Savoy		PO Box 800	Lake Charles	LA	70602	
Calcasieu Parish School Board	District 8		Jim'	Schooler		444 Ashland St.	Lake Charles	LA	70605	
Calcasieu Parish School Board	District 14		Roman L.	Thompson		4033 Briarfield Ln.	Lake Charles	LA	70607	
Calcasieu Parish Sheriff Dept	Chief Depputy		Gary 'Stitch'	Guillory		5400 East Broad St	Lake Charles	LA	70615	
Calcasieu Parish Sheriff Dept	Sheriff	Sheriff	Tony'	Mancuso		5400 East Broad St	Lake Charles	LA	70615	
Calcasieu Parish Sheriff Dept	Asst. Chief Deputy		G. Buba	Mayeaux		5400 East Broad St	Lake Charles	LA	70615	
Calcasieu Parish Sheriff Dept	Chief Deputy		Keith	Murray		4200 Kirkman St	Lake Charles	LA	70607	
Calcasieu Parish Sheriff Dept	Administator Asst.		Heather	Simon		5400 East Broad St	Lake Charles	LA	70615	
Calcasieu Parish Sheriff Dept	Special Services Commander		Matt	Vezirot		5400 East Broad St	Lake Charles	LA	70615	
Cameron Parish Office of Emergency Preparedness (OEP)	Secretary		Cassandra	Duhon		PO Box 374	Cameron	LA	70631	
Cameron Parish Office of Emergency Preparedness (OEP)			Danny	Lavergne		PO Box 374	Cameron	LA	70631	
Cameron Parish Police Jury	Administator		Ryan	Bourriaque	ryanb@camtel.net	PO Box 1280	Cameron	LA	70631	
Cameron Parish School Board	Superintendent	Supt.	Stephanie	Rodrique		PO Box 801	Lake Charles	LA	70603	
Chitimacha Tribe of Louisiana	Chairman		John	Darden		PO Box 661	Charenton	LA	70523-0661	
Choctaw-Apache Community of Ebarb	Chief		John	Porcell		PO Box 1428	Zwolle	LA	71486	
City of Lake Chalres	Councilwoman District A		Mary	Morris		2345 See St.	Lake Charles	LA	70601	
City of Lake Charles	Attorney	Mr.	Billy	Loftin		113 Dr. Michael DeBakey Dr.	Lake Charles	LA	70601	337-310-4300
City of Lake Charles	Councilman District B		Luvertha	August		2010 E. Mill St.	Lake Charles	LA	70601	
City of Lake Charles	City Council (collective)		City	Council	citycouncil@cityoflc.us	326 Pujc Street	Lake Charles	LA	70601	
City of Lake Charles	Councilman District G		Mark	Eckard	mark.eckard1@gmail.com	4502 Autumnwood Ln.	Lake Charles	LA	70605	
City of Lake Charles	Councilman District C		Rodney	Geyen		1531 Sixth Ave.	Lake Charles	LA	70601	
City of Lake Charles	Councilman District D		John	Ieyoub	jkieyoub@gmail.com	2018 Charvais Dr.	Lake Charles	LA	70601	
City of Lake Charles	Councilman District F		Dana Carl	Jackson		1705 Illinois St.	Lake Charles	LA	70607	
City of Lake Charles	Mayor	Mayor	Randy	Roach	rroach@cityoflc.us	161 E. Greenway St.	Lake Charles	LA	70605	
City of Lake Charles	Councilman District E		Stuart	Weatherford		1508 W. Sale St.	Lake Charles	LA	70605	
City of Lake Charles	Administrative Assistant		Richard	Broussard		4200 Kirkman St	Lake Charles	LA	70607	
City of Lake Charles Fire Department	Fire Chief	Chief	Keith	Murray		4200 Kirkman St	Lake Charles	LA	70607	
City of Lake Charles Fire Department	Planning and Research Officer		Robin	Rhorer		4200 Kirkman St	Lake Charles	LA	70607	
City of Lake Charles Police Department	Police Chief	Chief	Don	Dixon		830 Enterprise Blvd.	Lake Charles	LA	70601	
City of Sulphur	Mayor	Mayor	Chris	Duncan		101 N. Huntington Street	Sulphur	LA	70663	
Clifton Choctaw Tribe	Chairman		Tom	Neal		1312 Clifton Road	Clifton	LA	71447	

Local Officials and Tribes - Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	EMAIL	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE
Coushatta Tribe of Louisiana	Chairman		Kevin	Sickey		PO Box 818	Elton	LA	70532	
Coushatta Tribe of Louisiana	Chairman		Kevin	Sickey		PO Box 818	Elton	LA	70532	
Diocese of Lake Charles	Vicar General	Msgr.	Daniel	Torres		P.O. Box 3223	Lake Charles	LA	70602-3223	
Four Winds Trive LA Cherokee	Principal Chief		Jackie	Womack		306 W 1st St	DeRidder	LA	70634	
Grand Caillou/Dulac Band	Chief		Shirell	Parfait-Dardar		5057 Bayouside Dr	Chauvin	LA	70344	
Isle de Jean Charles Band	Chief		Albert	Naquin		100 Dennis St	Montegut	LA	70377	
Jena Band of Choctaws	Chief		Beverly Cheryl	Smith		PO Box 1428	Jena	LA	71432	
LA Workfore Commission	Executive Director		Curt	Eysink		PO Box 94094	Baton Rouge	LA	70804	
LA Workfore Commission	Director		David	Helveston		PO Box 94094	Baton Rouge	LA	70804	
LA Workfore Commission	WIB Director		Stephanie	Seemion		2424 3rd Street	Lake Charles	LA	70601	
Lake Area Industry Alliance	Executive Director		Larry	DeRoussel		PO Box 2225	Lake Charles	LA	70602	
Lake Charles Harbor & Terminal District	Commissioner		Daryl	Burckel	burckel@bellsouth.net	3287 Glen Eagle Drive	Lake Charles	LA	70605	
Lake Charles Harbor & Terminal District	Commissioner		Dudley	Dixon	ddixon1995@aol.com	1311 Dewey St	Westlake	LA	70669	
Lake Charles Harbor & Terminal District	Commissioner		Mike	Eason	mkeason2000@yahoo.com	3130 Saint Andrews Drive	Lake Charles	LA	70605	
Lake Charles Harbor & Terminal District	Commissioner		Elcie	Guillory	rubory@aol.com	509 St. Mary Street	Lake Charles	LA	70615	
Lake Charles Harbor & Terminal District	Commissioner		John	LeBlanc	jleblanc@portlc.com	948 N. Kade Street	Lake Charles	LA	70605	
Lake Charles Harbor & Terminal District	Commissioner		Barbara	McManus	bamcmanus10959@gmail.com	240 Shell Beach Drive	Lake Charles	LA	70601	
Lake Charles Harbor & Terminal District	Executive Director		Bill	Rase	brase@portlc.com	PO Box 3753	Lake Charles	LA	70602	
Lake Charles Harbor & Terminal District	Commissioner		Walter	Sanchez	wsanchez@walsanchez.com	4928 Opal Drive	Lake Charles	LA	70605	
Louisiana Wildlife Federation	District 7, Vice President		Fred	Borel		317 W Sallier St	Lake Charles	LA	70601	
Pointe-Au-Chien Tribe	Chairman		Charles	Verdin		PO Box 416	Montegut	LA	70377	
SWLA Economic Development Alliance	VP- Economic Development		David	Conner	dconner@allianceswla.org	PO Box 3110	Lake Charles	LA	70602	
SWLA Economic Development Alliance	Vice President of Workforce Development		Richard	Smith	rsmith@allianceswla.org	PO Box 3110	Lake Charles	LA	70802	
SWLA Economic Development Alliance	President/CEO		George	Swift	gswift@allianceswla.org	PO Box 3110	Lake Charles	LA	70602	
Tunica-Biloxi Tribe of Louisiana	Tribal Chairman		Earl	Barbry Sr		PO Box 1589	Marksville	LA	71351	
United Houma Nation	Principal Chief		Thomas	DarDar Jr		20986 Hwy 1	Golden Meadow	LA	70357	
United Way of Southwest Louisiana, Inc.	President/CEO		Denise	Durel		715 Ryan Street, Suite 102	Lake Charles	LA	70601-4242	
Westlake Chemical Corporation	Chairman of SW LA Safety Council		Joe	Adrepont		PO Box 2449	Sulphur	LA	70664	

Businesses, Organizations, Citizens - Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE	EMAIL
A+ Motel & RV Park			Deanette	Franks	4631 Hwy 27 S	Sulphur	LA	70665		
Alcoa Carbon Products			Mack	Whittaker	P. O. Box 3738	Lake Charles	LA	70602		
Allied Barton Security Services	Business Development Manager		Suzanne	Chisholm	3222 Burke, Suite 105B	Pasadena	TX	77504	(713) 477-4449	
American Red Cross Of Southwest Louisiana			Bobbi	Zaunbrecher	3512 Kirkman Street	Lake Charles	LA	70607-1836		
ASCO					307 Bunker Road	Lake Charles	LA	70605		
Associated Builders and Contractors	Executive Director	Mr.	Kirby	Bruchhaus	19251 Highland Rd.	Baton Rouge	LA	70809	225-752-1415	
Baker Engineering			Bill	Stein	600 Bavou Pines East, Ste B	Lake Charles	LA	70601		
BASDEN AGENCIES INC	President		Alan	Basden	1009 W. McNeese St.	Lake Charles	LA	70605	(337) 479-2424	
Beard Construction			Warren	King	3970 Rose Dale Rd	Port Allen	LA	70767		wking@beardconstructiongroup.com
BG LNG Services			Marc	Hopkins	5444 Westheimer Road # 1775	Houston	TX	77056-5397	(713) 599-3747	
BG LNG Services			Robert	Parker	5444 Westheimer Road, Suite 1775	Houston	TX	77056-5326		
BG LNG Services, LLC	Manager Marine Terminals		Scott	Ervin	5444 Westheimer, Suite 1200	Houston	TX	77056	(713) 599-3750	
Bollinger Calcasieu, L.L.C.					8086 Global Drive	Sulphur	LA	70665-8807		
Calcasieu Council on Aging			Rosalind	Berry	3950 Hwy. 14	Lake Charles	LA	70607		
Calcasieu Historical Preservation Society	President	Ms.	Nancy	Moss	P.O. Box 1214	Lake Charles	LA	70602		
Calcasieu Historical Preservation Society	Advocacy Chair		Adley	Cormier	P.O. Box 1214	Lake Charles	LA	70602		ajpcormier@aol.com
Calcasieu Historical Preservation Society	Treasurer	Mr.	Matt	Young	P.O. Box 1214	Lake Charles	LA	70602		
Calcasieu League for Environmental Action Now					329 Wilson Ave.	Lake Charles	LA	70601		
Calcasieu Parish Assessor's Office			Allyson	Bourriaque	1011 Lakeshore Dr	Lake Charles	LA	70601		
Calcasieu Parish Central Library	Library Director	Dr.	Gabriel	Morley	301 W. Claude St.	Lake Charles	LA	70605	337-721-7166	
Calcasieu Parish Central Library	Public Information Officer		Christy	Duhon	301 W. Claude St.	Lake Charles	LA	70605		
Calcasieu Parish Policy Jury	District 12 of Ward 3 Waterworks		Kelly	Goodman	P.O. Box 4767	Lake Charles	LA	70606		
Calcasieu Police Jury			Alberto	Galan						agalan@cpji.net
Calcasieu Police Jury			Jennifer	Wallace						jwallace@cpji.net
Cameron LNG	Health , Safety, Security & Environmental Manager		Steve	Trahan	P.O. Box 439	Hackberry	LA	70631	(337) 680-4526	
Cameron LNG, LLC	Terminal Manager		Randy	Oakley	301 N. Main Street	Hackberry	LA	70645	(337) 762-3256	
Cameron Parish Chamber of Commerce					P O Box 1248	Cameron	LA	70631		
Cameron Parish Library	Library Director		Patricia	Boatman	PO Box 1130	Cameron	La	70631		pboatman@cameron.lib.la.us
Cameron Parish Police Jury	Parish Administrator		Ryan	Bourriaque	Post Office Box 1280	Cameron	LA	70631	337-775.5718	ryanb@camtel.net
Career Goals			Greg	David						greg@careergoalsinc.com
Career Goals			Wendy	Harper						wendy_mann@suddenlink.net
CDI Engineering Solutions	Business Development Manager Mechanical Engineer		Mario	Espinosa	4041 Essen Lane, Suite 10	Baton Rouge	LA	70809	256634488	
CH2MHill	Director of Ports and Harbors		Allen	Dupont	2800 Veterans Memorial Blvd, Ste 252	Metairie	LA	70002	(504) 832-9509	
Chamber SWLA			Paula	Ramsey						pramsey@allianceswla.org
Cheniere LNG, Inc.	Community Relations Manager, Louisiana		James	Ducote	5582 Gulf Beach Highway	Cameron	LA	70631	(337) 569-2311	
Chevron			Russ	Manuel	PO Box 623	Westlake	LA	70669		
CINTAS			Deanne	Blanchard	311 E. Hale St, C	Lake Charles	LA	70601		
Cintas			Caprice	Bush	408 Pryce St	Lake Charles	LA	70601		
CITGO			Winston	Ebarb	1293 Eldridge Parkway	Houston	TX	77077		
CITGO	Sr. Corporate Counsel		Charles	Harper	PO Box 1562	Lake Charles	LA	70602	(337) 708-7422	
CITGO			Steve	Newman	1293 Eldridge Parkway	Houston	TX	77077		
CITGO	Marine Technical Services Manager	Capt.	Thomas	Fanning	1293 Eldridge Parkway	Houston	TX	77077	(832) 486-1558	
CITGO - Lake Charles			Ken	Rodericks	P.O. Box 1562	Lake Charles	LA	70602	(337) 708-8447	
CITGO Petroleum Corporation	Special Assignment Area Manager Oil Movement		Alirio	Zambrano	P.O. Box 1562	Lake Charles	LA	70602	(337) 708-6614	
Citizen	Citizen		Charlie	Atherton	122 Vine St	Sulphur	LA	70663		
City of Lake Charles			John	Cardone	809 Kirby St	Lake Charles	LA	70602		
City of Lake Charles			Eligha	Guillory	PO Box 900	Lake Charles	LA	70602		
City of Westlake			Lori	Manuel	908 Guillory St	Westlake	LA	70669		
CLM Equimet Co., Inc	Account Manager		Tony	Colletta	4851 E. Napoleon	Sulphur	LA	70663	(337) 625-5942	
Colt Group			Ernest	Broussard	724 Kirby St	Lake Charles	LA	70601		
Colt Group			Brandon	Broussard	724 Kirby St	Lake Charles	LA	70601		
Congressman Boustany			Joe	Hill	1 Lakeshore Dr, #1775	Lake Charles	LA	70629		
Congressman Boustany Office			Charles	Dalgleish						charles.dalgleish@mail.house.gov
Conoco Phillips	Plant Manager		Willie	Tempton	P.O. Box 37	Westlake	LA	70669	(337) 491-5222	
ConocoPhillips	Director, Marine Terminal Advisors-Commercial Marine Risk Management	Capt.	Kurt	Hallier	600 North Dairy Ashford	Houston	TX	77079-1175	(281) 293-1833	
Contract Land Staff			Greg	Spicer						greg.spicer@contractlandstaff.com
Contractor			Kay & Larry	Woodcock	PO Box 1446	Lake Charles	LA	70602		
Convention & Visitors Center			Donna	Richard	1301 Shellbeach St	Lake Charles	LA	70601		
Corps of Engineers	Project Manager - Calcasieu River		Tracy	Falk	P.O. Box 60267	New Orleans	LA	70160-0267	(504) 862-2971	
Corps of Engineers	Deputy District Commander	LTC	Nathan	Joseph	P.O. Box 60267	New Orleans	LA	70160-0267	(504) 862-2077	
Corps of Engineers			Calix	MVN	P.O. Box 60267	New Orleans	LA	70160-0267	(504) 862-1378	
CPRA			Natalie	Peyronnin	450 Laurel St., Suite 1208	Baton Rouge	LA	70801		
Crowley Marine Services			Rick	Bastian	8200 Big Lake Rd.	Lake Charles	LA	70605		

Businesses, Organizations, Citizens - Stakeholders

OFFICE	POSITION	TITLE	FIRST NAME	LAST NAME	DELIVERY ADDRESS	CITY	STATE	ZIP	PHONE	EMAIL
Crowley Marine Services	Port Captain	Capt.	Stephen	Porter	8200 Big Lake Rd.	Lake Charles	LA	70605	(337) 478-2403 ext 22	
CSRS			Travis	Woodard	6767 Perkins Road, Suite 200	Baton Rouge	LA	70808		
CSRS, INC			Lyles	Budden	6767 Perkins Road, B12	Baton Rouge	LA	70808		
D A Wolfe Workwear			Jim	Hoggins						jim@dawolfe.com
Devall Towing			Joe	Devall	2244 Swisco Road	Sulphur	LA	70663		
Dunham Price Group, LLC	Material Handling, LLC Manager		Dav	Godsey	P.O. Box 760	Westlake	LA	70669-0760	(337) 436-4051	
Dynamic Industries			Ralph	Clements						
Dynamic Industries, Inc	Operations		Robert	Ward	600 Jefferson St., Suite 1400	Lafayette	LA	70501	(337) 480-6009	
Dynamic Industries, Inc.	Facility Manager		Don	Darbonne	3744 Henry Pugh Blvd.	Lake Charles	LA	70605	(337) 480-6009	
Empire of the Seed			Rick	Richard	PO Box 2221	Lake Charles	LA	70602		
Environmental Response Services	Pres. /Gen Mngr.		Neil	Clark	P.O. Box 4288	Lake Charles	LA	70606		
ERA Moffett Real Estate			Mary Ann	Booth						maboath@eramoffett.com
Frazer Memorial Library	Archivist and Special Collections	Ms.	Patti	Threatt	Box 91445, McNeese State University	Lake Charles	LA	70609	337-475-5731	pthreatt@mcneese.edu
G2X Entegy	Vice President of Project Development		Steve	Hirsh	600 Travis, Suite 3680	Houston	TX	77002		
GICA (Gulf Intracoastal Canal Association)	Executive Director		Jim	Stark	P.O. Box 6846	New Orleans	LA	70174	(901) 490-3312	
GMA Architect			Jason	Mitchell	900 Ryan St, Suite 600	Lake Charles	LA	70601		
Grace Davison					P.O. Box 3247	Lake Charles	LA	70602-3247		
Greenfield Logistical Solutions of LA			Sam	Pate	PO Box 1567	Lake Charles	LA	70602		
Gulf Coast Environmental Labor Coalition					3515 N I 10 Service Rd. W	Metairie	LA	70002-5931		
H & E Equipment			Neil	Simoneaux	1918 Southwood Drive	Lake Charles	LA	70605		
H & E Equipment			Gray	Vanek	2200 Louis Allernon Pky	Sulphur	LA	70663		
Harbor Docking & Towing			Dwayne	Chatoney	P. O. Box 248	Westlake	LA	70663		
Harvis DeVille & Assoc			Payton	Kieth	825 Laurel St	Baton Rouge	LA			
Hixson Funeral Home			Judy	Barrilleaux						joanna.barrilleaux@dignitymemorial.com
Holiday Inn & Suites			Francesca	Borra	2940 Lake St	Lake Charles	LA	70601		
Holiday Inn Express Sulphur			Rhonda	Colletta	102 Mallard St	Sulphur	LA	70665		sales@hiesulphur.com
Hotels of Lake Charles			Nick	Zeaver	320 S. Cities Service	Sulphur	LA	70663		
HSE			James	Ambrose	1057 Walnut Hill Road	Leesville	LA	71446		
Hutco			Greg	Carlin	PO Box 27	Sulphur	LA	70665		
Iberia Bank			Barry	Brown	4440 Nelson Road	Lake Charles	LA	70601		
Iberia Bank			John	Mitchell	5723 W. Dietrich Loop	Lake Charles	LA	70605		
Iberia Bank			Steven	Peer	4440 Nelson Road	Lake Charles	LA	70605		
IFG Port Holdings, LLC	Chairman & Chief Executive		Kabir	Ahmad	1500 Broadway, Suite 2011	New York	NY	10036	(212) 302-9000	
IMCAL			Grant	Bush	326 Pupo St	Lake Charles	LA	70662		
Inchcape Shipping Services	Port Manager		Mark	Pippin	710 West Prien Lake Road	Lake Charles	LA	70601	(337) 474-3433	
ISC Constructors, LLC	Vice President Beaumont Office		Craig	Messer	6350 Walden Road	Beaumont	TX	77707	(409) 842-3500	
Isle of Capri			English	Josey	271 Hampton Court	Lake Charles	LA	70605		
J Walker & Co			Jonald	Walker	949 Ryan St, Suite 100	Lake Charles	LA	70601		
JHC			Jim	Henry	908 Guillory St	Westlake	LA	70669		
Knights of Columbus	Area Coordinator		Donald	Laurent	P.O. Box 3223	Lake Charles	LA	70602-3223		
La CPRA OCPR	Engineering Supervisor		Jerome	Zeringue	PO Box 44027	Baton Rouge	LA	70804		
Lake Area Industry Alliance	Executive Director		Larry	DeRoussel	P. O. Box 2225	Lake Charles	LA	70602	(337) 436-6800	
Lake Charles Harbor & Terminal District	Director of Navigation and Security		Channing	Hayden	Post Office Box 3753	Lake Charles	LA	70602	(337) 493-3620	
Lake Charles Harbor and Terminal District	Executive Director	Mr.	William	Rase, III	P.O. Box 3753	Lake Charles	LA	70602	337-439-3661	
Lake Charles Pilots		Capt.	Charles	Morrison	4902 Ihles Road	Lake Charles	LA	70605	(337) 436-0372	
Lake Charles Pilots			George	Mowbray	4902 Ihles Road	Lake Charles	LA	70605		
Lake Charles Pilots	President		Dave	Trent	4902 Ihles Road	Lake Charles	LA	70606		
Lake Charles Pilots	Business Manager	Mr.	Dan (Blade)	Morrish						officemr@lakecharlespilots.com
Lake Charles Pilots Association		Capt.	Brett	Palmer	4902 Ihles Rd	Lake Charles	LA	70605		
LaQuinta			Alicia	Boutte	1201 W. Prien Lake Rd	Lake Charles	LA	70601		
Lauberge Casino			Kimberly	Dixon	3202 Nelson Road	Lake Charles	LA	70601		
LC Convention & Visitors Bureau			Stephanie	Guilbeaux						squilbeaux@visitlakecharles.org
LEEVAAC	VP/General Manager		Richard	Ortego	8200 Big Lake Rd., Bldg. A	Lake Charles	LA	70605	(337) 214-0532	
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Leucadia National Corporation	Consultant		Cliff	Kerr	7318 Fountain Spray	Katy	TX	77494	(281) 394-2320	
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Louisiana State Police			Sean	LaFleur	805 Main St	Lake Charles	LA	70615		
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Louisiana State Police			John	Porter	805 Main St	Lake Charles	LA	70615		
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West Cameron Port	Port Director		Stephen	Broussard	P O 1271	Cameron	LA	70631	(337) 775-5206	
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Wholesale Electric			M	Bradford	2916 E Napoleon	Sulphur	LA	70663		

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			Kathleen Dorsey	Bellow	503 N Grace St	Lake Charles	LA	70615		
			Alan	Courmier	340 N Post Oak Rd	Sulphur	LA	70663		
			Bob	Emmerson	25165 Ramrock	Kingswood	TX	77365		
			Louis & Penny	Haxthausen	PO Box 1892	Lake Charles	LA	70605		
			Kecee	Lewis	1702 N Junior St	Lake Charles	LA	70601		
			David	Nunez	6713 E Calcasieu Drive	Lake Charles	LA	70605		
			Cal	Schexneider	828 4th Ave	Lake Charles	LA	70601		
			Tony	Theriot	10020 Broussard Road	Bell City	LA	70630		
			Donald	Vidrine	9 Poinsetta Rd	Sulphur	LA	70663		
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Newspaper/Daily	Informer column/editor		Andrew	Perzo	American Press	P.O. Box 2893	Lake Charles	LA	70602	337-494-4098,press 5	aperzo@americanpress.com	www.americanpress.com
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Magazine/Bi-Monthly	Executive Editor		Lauren	de Albuquerque	The Jambalaya News	715 Kirby St.	Lake Charles	LA	70601	337-436-7800	lauren@thejambalayanews.com	www.thejambalayanews.com
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TV/Lake Charles	Video Journalist		Rhonda	Kitchens	KVHP-TV FOX 29/CW 9	129 W. Prien Lake Rd.	Lake Charles	LA	70601	337-474-1316	rkitchens@watchfox.com	www.watchfox29.com



BREAKING NEWS: Senior U.S. defense official confirms active shooter incident at Fort Hood in Texas, has no further details

Japan's Kansai to buy U.S. Cameron LNG from Mitsui

TOKYO, April 1 Mon Mar 31, 2014 9:23pm EDT

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(Reuters) - Japan's second-biggest utility, Kansai Electric Power Co, said it had signed a 20-year contract to buy 400,000 tonnes per year of U.S. Cameron liquefied natural gas (LNG) from trader Mitsui & Co at U.S. Henry Hub-linked prices.

The Osaka-based firm said it would buy for 20 years from the project's planned launch, scheduled for late 2017.

LNG imports by Japan, the world's top buyer of the super-cooled fuel, have jumped since the Fukushima nuclear disaster, with utilities looking to boost supplies from North America to diversify supply sources and lower prices.

The deal marks Kansai's second purchase of U.S. shale gas. It has agreed to buy 800,000 tonnes per year from the U.S. Cove Point export plant in Maryland.

The U.S. Energy Department in February approved exports from Sempra Energy's Cameron LNG project as the Obama administration moves forward with its goal of expanding the global market for the fuel. (Reporting by Osamu Tsukimori; Editing by Joseph Radford)

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30-Year Fixed Refi	4.53%	4.33%
15-Year Fixed Refi	3.41%	3.35%
5/1 ARM Refi	3.36%	3.32%

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March 20, 2014

Ms. Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, N.E.
Washington, D.C. 20426

**Re: Sabine Pass LNG, L.P. and Sabine Pass Liquefaction, LLC
Monthly Construction Progress Report for Sabine Pass Liquefaction Project
Docket Nos. CP11-72-000 & CP13-2-000**

Dear Ms. Bose:

On April 16, 2012, the Federal Energy Regulatory Commission ("FERC") issued an Order Granting Authorization under Section 3(a) of the Natural Gas Act ("April 16 Order") in the above-captioned docket. The Order authorizes Sabine Pass LNG, L.P. and Sabine Pass Liquefaction, LLC ("Sabine Pass") to site, construct, and operate the Sabine Pass Liquefaction Project at the Sabine Pass LNG Terminal, located in Cameron Parish, Louisiana. On August 2, 2013, the FERC issued an Order Amending Section 3 Authorization ("August 2 Order") for the Sabine Pass Modification Project.

Pursuant to Condition 7 in Appendix D of the April 16 Order, and Condition 7 of the August 2 Order, Sabine Pass is herein submitting its monthly construction progress report for February 2014.

Should you have any questions about this filing, please feel free to contact the undersigned at (713) 375-5000.

Thank you,

/s/ Karri Mahmoud

Karri Mahmoud
Sabine Pass LNG, L.P.
Sabine Pass Liquefaction, LLC

cc: Ms. Senth White, Federal Energy Regulatory Commission
Ms. Karla Bathrick, Federal Energy Regulatory Commission
Ms. Magdalene Suter, Federal Energy Regulatory Commission
Mr. Stephen Kusy, Federal Energy Regulatory Commission

SABINE PASS LIQUEFACTION PROJECT

Cameron Parish, Louisiana

Monthly Progress Report

February 2014

Sabine Pass LNG, L.P. and Sabine Pass Liquefaction, LLC
February 2014 Monthly Progress Report

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Sabine Pass LNG, L.P. and Sabine Pass Liquefaction, LLC
February 2014 Monthly Progress Report

1.0 Executive Summary

This report covers activities of the SPL Stage 1 and SPL Stage 2 projects occurring during the month of February 2014. Stage 1 Engineering is 94.4% complete, Procurement is 91.4%, and Subcontract and direct hire Construction work are 37.1% and 18.6% complete, respectively, for the period. Stage 1 overall project completion is 60.8% against the plan of 63.6%.

Stage 2 Engineering is now 48.1% complete, Procurement is 38.1%, and Subcontract and direct hire Construction work are 12.0% and 0.4% complete, respectively. Overall project completion for Stage 2 is 23.3% against the plan of 22.3%.

Actual project progress and current recovery plans continues to support the achievement of the scheduled Substantial Completion Dates for Trains 1 and 2, which remain as February 2016 and June 2016, respectively. Trains 3 and 4 Substantial Completion Dates are April 2017 and August 2017.

2.0 Project Highlights

In February, Stage 1 engineering is complete and is in punch list mode. For Stage 2, engineering completed the IFC of all Train 3 ISOs.

The Train 1 heavy wall vessels and the propane substation building have arrived at Site. The 1st set of refrigeration compressors are in transit and will arrive in March, as will the BOG compressors and the first shipments of air coolers for the Train 1 cryo rack. First structural steel for Train 3 was delivered to site in February. Procurement continues to support construction activities at the jobsite through delivery of piping and structural items.

During the month of February, Subcontracts managed the following major subcontracts for Trains 1 and 2: soil improvement, field erected tanks, onsite concrete batch plant, offsite equipment insulation, permanent telecommunications, and fire/gas detection. The electric heat tracing subcontract was awarded. For Trains 3 and 4, Subcontracts managed efforts for pile fabrication and installation, field erected tanks, and busing.

Construction in Train 1 continued in structural and paving concrete, structural steel erection, and installation of underground and aboveground piping, electrical grounding, cable tray and mechanical equipment. Train 2 work continued in structural and paving concrete, structural steel erection, electrical grounding, and installation of underground and aboveground pipe. Construction in the OSBL area continued with structural and paving concrete, structural steel erection, electrical grounding, installation of underground and aboveground pipe, and mechanical equipment installation. The Revamp area continued in structural concrete, structural steel erection, underground and aboveground piping, and electrical cable.

Construction in Train 3 continues with concrete works in area 233N01 and Train 3 underground piping. Seal slabs have been poured in area 233A01 and 233D01 and excavation was done for the hot oil sump.

3.0 Environmental, Safety & Health Progress

During the month of February, the project had 34 first aid, 18 near misses, and 1 OSHA recordable.

Sabine Pass LNG, L.P. and Sabine Pass Liquefaction, LLC
February 2014 Monthly Progress Report

	Near Miss Cases		First Aid		OSHA Cases		LWDC Cases	
	Month	ITD ¹	Month	ITD ¹	Month	ITD ¹	Month	ITD ¹
Bechtel	18	106	34	267	1	8	0	0
Subcontractors	0	26	0	20	0	5	0	0
Total	18	132	34	287	1	13	0	0

¹ ITD = Project totals reflect inception to date and are combined for Stage 1 & 2.

4.0 Schedule

Overall, Train 1 & 2 project progress is 60.8% complete against a plan of 63.6%. Overall Train 3 & 4 project progress is 23.3% complete against a plan of 22.3% complete.

5.0 Construction

Area	Comments	Planned Work for Next Reporting Period
Liquefaction Stage 1 Area – Train 1	<ul style="list-style-type: none"> Continued constructing foundations, erecting structural steel and installing above ground and underground piping. Continued installing mechanical equipment. Continued installing electrical cable tray in the propane condenser rack. 	<ul style="list-style-type: none"> Continue activities to support Train 1 construction.
Liquefaction Stage 1 Area – Train 2	<ul style="list-style-type: none"> Continued constructing foundations, erecting structural steel and installing above ground and underground piping. Installing mechanical equipment 	<ul style="list-style-type: none"> Continue activities to support Train 2 construction.
Liquefaction Stage 2 Area – Train 3	<ul style="list-style-type: none"> Placement of the seal slab in the Train 3 propane Area. Train 3 piles reached substantial completion. Started placement of structural concrete. Started excavation for the hot oil sump. Started underground piping installation in the Train 3 area. 	<ul style="list-style-type: none"> Continue soil stabilization. Continue pile driving. Continue activities to support Train 3 construction.
Liquefaction Stage 2 Area – Trains 4	<ul style="list-style-type: none"> Soil Stabilization Continue pile driving activities within Train 4 and OSBL. 	<ul style="list-style-type: none"> Continue soil stabilization. Continue pile driving.

Sabine Pass LNG, L.P. and Sabine Pass Liquefaction, LLC
February 2014 Monthly Progress Report

Area	Comments	Planned Work for Next Reporting Period
OSBL	<ul style="list-style-type: none"> • Constructing pipe racks in the LNG Tank 3 and 5 areas. • Constructing the marine flare. • Continued constructing foundations and erecting structural steel. 	<ul style="list-style-type: none"> • Continue activities to support OSBL construction.
Support Buildings Area	<ul style="list-style-type: none"> • Continued construction of the warehouse and control room. • Continued constructing pipe racks in the Tank 3 and 5 areas. • Continued constructing the marine flare. 	<ul style="list-style-type: none"> • Continue warehouse and control room work.
Access Roads, Waterline	<ul style="list-style-type: none"> • Water trucks were operated for dust control, as necessary. 	<ul style="list-style-type: none"> • Dust control will continue.
Laydown, Staging Areas	<ul style="list-style-type: none"> • Continued mixing for soil stabilization and began laying rock in the area north of Trains 3 and 4. 	<ul style="list-style-type: none"> • Contractors will continue to mobilize personnel and equipment.
Construction Dock (Ro-Ro)	<ul style="list-style-type: none"> • Received and offload pile barges at the construction dock. • Receiving and offloading heavy equipment at the Ro-Ro. • Dredging occurred this period. 	<ul style="list-style-type: none"> • Continue to receive pile barges.

6.0 Permitting and Environmental

None.

Summary of Problems, Non-Compliances, and Corrective Actions.

Date	Description
None.	

Agency Contacts/Inspections

Agency	Name	Date	Location/Activity

Proposed Changes to Schedule or Scope:

None.

Sabine Pass LNG, L.P. and Sabine Pass Liquefaction, LLC
February 2014 Monthly Progress Report

7.0 Progress Pictures



Train 1 131G02 (inlet gas-seal slab for paving) (24-Feb-2014)



Train 1 131K01 (dehydration mercury removal) (24-Feb-2014)

Sabine Pass LNG, L.P. and Sabine Pass Liquefaction, LLC
February 2014 Monthly Progress Report



Train 1 131N01 (propane rack accumulator set) (20-Feb-2014)



Train 1 131N02 (propane substation) (24-Feb-2014)

Sabine Pass LNG, L.P. and Sabine Pass Liquefaction, LLC
February 2014 Monthly Progress Report



Train 1 131N01 (set accumulator) (24-Feb-2014)



Train 2 132A01 (compressor methane tabletop) (27-Feb-2014)

Sabine Pass LNG, L.P. and Sabine Pass Liquefaction, LLC
February 2014 Monthly Progress Report



Train 2 132A02 (compressor substation) (27-Feb-2014)



Train 2 132B01 (amine storage area and thermal oxidizer) (24-Feb-2014)

Sabine Pass LNG, L.P. and Sabine Pass Liquefaction, LLC
February 2014 Monthly Progress Report



Train 2 131M01 (heavies removal unit paving) (13-Feb-2014)



OSBL 135F01 (water treatment area) (24-Feb-2014)

Certificate of Service

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary in this proceeding.

Dated at Houston, Texas this 20th day of March 2014.

/s/ Karri Mahmoud

Karri Mahmoud

Sabine Pass LNG, L.P.

Sabine Pass Liquefaction, LLC

Document Content(s)

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DOE approves Dominion Cove Point LNG exports to non-FTA countries

WASHINGTON, DC, Sept. 11

09/11/2013

By [Nick Snow](#)

OGJ Washington Editor

The US Department of Energy approved Dominion Cove Point LP's application to export LNG from its terminal in Calvert County, Md., to countries that do not have a free-trade agreement with the US.

Subject to environmental review and final regulatory approval, the facility on Chesapeake Bay received **conditional authorization** to export as much as 0.77 bcf/d for of 20 years, DOE said on Sept. 11. The installation previously received clearance to export **LNG** to non-FTA countries on Oct. 7, 2011, it noted.

"We agree with DOE's decision that exports are expected to bring economic benefits to the country," said Thomas F. Farrell II, chief executive of parent Dominion Resources Inc. "It is good news on many fronts, including the thousands of jobs that will be created, the boost in government revenues that will result, and the support it provides to allied nations."

Dominion Cove Point's proposed liquefaction and export operations are expected to cost \$3.4-3.8 billion. The company sought approval for them in March from the US Federal Energy Regulatory Commission. Pending receipt of regulatory approval and permits, construction is scheduled to begin in 2014, with a 2017 in-service date.

The installation already has robust infrastructure, including connections to the pipeline grid, LNG storage capacity, and an updated pier. Construction will chiefly entail adding liquefaction capability, Dominion said.

It said the facility's capacity is fully subscribed, with signed 20-year terminal service agreements. Pacific Summit Energy LLC, a US affiliate of Japanese trading company Sumitomo Corp., and GAIL Global (USA) LNG LLC, a US affiliate of GAIL (India) Ltd., each have contracted for half of the marketed capacity.

Under amendments to the 1920 Natural Gas Act, DOE is required to determine if an applicant's request to export LNG to a non-FTA country is in the national interest. In Dominion Cove Point's case, it said it considered the economic, energy security, and environmental impacts, as well as public comments for and against the application and nearly 200,000 public comments related to the associated analysis of the cumulative impacts of increased LNG exports.

Dominion Cove Point is the fourth US LNG terminal to gain DOE approval of exports to non-FTA nations. Sabine Pass Liquefaction LLC, Freeport LNG Expansion LLC, and Lake Charles Exports LLC's applications were approved earlier. DOE has another 19 non-FTA LNG export applications under review.

Contact [Nick Snow](#) at nicks@pennwell.com.

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FACTBOX-North America natural gas export plans

Fri, Mar 14 2014

March 14 (Reuters) - Freeport LNG's proposed liquefied natural gas export terminal in Texas inched closer to approval by the Federal Energy Regulatory Commission with the release of a draft report on Friday finding the project would not cause significant environmental harm.

Companies need approval from both the U.S. Department of Energy, which determines whether the proposed exports would be in the public interest, and FERC, which assesses safety and environmental effects of the projects' construction and operation.

Freeport is one of four companies waiting for a decision from FERC after receiving permission from the DOE for exports to countries without free trade agreements with the United States.

Cheniere Energy Inc's Sabine Pass project in Louisiana is the only terminal that has received permission from both agencies so far.

FERC typically sets a schedule for carrying out its environmental review of each project, with decisions on licenses usually issued 30 to 90 days after the assessments are completed.

Below is a table showing the proposed and potential LNG export plants in North America according to FERC and the release dates set for the commission's environmental reviews so far. Capacity is in billion cubic feet per day (*indicates project has received DOE, non-free trade agreement approval).

Approved by FERC

Project	State	Company	Start Up	Capacity
*Sabine Pass	Louisiana	Cheniere Energy	2015	2.6

Proposed to FERC

*Freeport LNG	Texas	Freeport LNG/FLNG Liquefaction	2015	1.8
*Lake Charles	Louisiana	Southern Union-Trunkline LNG	TBD	2
*Cove Point	Maryland	Dominion	2016	0.77
*Hackberry	Louisiana	Sempra-Cameron LNG	2018	1.7
Coos Bay	Oregon	Jordan Cove Energy Project	2017	0.9
Elba Island	Georgia	Southern LNG Company	TBD	0.35
Lavaca LNG	Texas	Excelerate Liquefaction	2017	1.38
Magnolia LNG	Louisiana	LNG Limited	2017	1.07
Sabine Pass, TX	Texas	ExxonMobil-Golden Pass	2018	2.1
Corpus Christi	Texas	Cheniere Energy	2017	2.1
Plaquemines Parish	Louisiana	CE FLNG	2018	1.07
Astoria	Oregon	Oregon LNG	2017	1.3
Sabine Pass, LA	Louisiana	Sabine Pass Liquefaction (expansion)	2017	1.3

Final environmental reviews scheduled by FERC

Freeport LNG	June	16, 2014
Cove Point	May	15, 2014
Hackberry (Cameron LNG)	April	30, 2014
Corpus Christi	Oct.	8, 2014

Potential U.S. Project Sites

Project	State	Company	Start-up	Capacity
Cameron Parish	Louisiana	Gasfin Development	TBD	0.2
Brownsville	Texas	Gulf Coast LNG Export	TBD	2.8
Pascagoula	Mississippi	Gulf LNG Liquefaction	TBD	1.5

Cameron Parish	Louisiana	Venture Global	TBD	0.7
Cameron Parish	Louisiana	Waller LNG Services	TBD	0.16
Ingleside	Texas	Pangea LNG	2018	1.09

Proposed Canadian Sites

Kitimat	British Columbia	Apache Canada	2015	0.7
Douglas Island	British Columbia	BC LNG Export Cooperative	2014	0.25
Kitimat	British Columbia	LNG Canada	2020	3.2

Potential Canadian Project Sites

Prince Rupert Island	British Columbia	BG Group	2021	4.2
Goldboro LNG	Nova Scotia	Pieridae Energy Canada	2020	0.7
Melford	Nova Scotia	H-Energy	2020	1.8
Prince Rupert Island	British Columbia	Pacific Northwest LNG	TBD	2.5
Prince Rupert Island	British Columbia	ExxonMobil-Imperial	TBD	3.8
Squamish	British Columbia	Woodfibre LNG Export	TBD	0.3

(Reporting by [Ayesha Rascoe](#); Editing by Marguerita Choy)

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MAGNOLIA LNG fact sheet

PROJECT

Magnolia LNG, LLC, proposes to construct, own and operate a mid-scale liquefied natural gas (LNG) export facility that will use a thermally efficient LNG process technology.

LOCATION

108 acres of industrial land on Industrial Canal South Shore (PLC Tract 475), through a long-term lease with the Lake Charles Harbor and Terminal District (Port of Lake Charles).

The Project site is located on an existing LNG shipping channel and the facility will be accessible by road, near the intersection of Henry Pugh Boulevard and Big Lake Road (Conceptual Layout and Site Map on reverse side).

PROCESS

It is proposed that the Project will receive natural gas via an existing pipeline. The natural gas will be treated, liquefied, and stored onsite. The LNG will be loaded onto LNG vessels for delivery to domestic and export markets and into trucks for domestic distribution in Louisiana and surrounding states.

CAPACITY

At full plant capacity, the Project will consist of four LNG trains (gas liquefaction units), each with a nominal LNG production capacity of 2 million tonnes per annum (mtpa).

TECHNOLOGY

Optimized Single Mixed Refrigerant (OSMR[®]) liquefaction process has the following main features, which contribute to its high efficiency and 30% less emissions:

- Aeroderivative gas turbines and efficient compressors.
- Combined heat and power plant, which minimizes plant fuel gas use.
- Steam-driven ammonia refrigeration system.

OSMR[®] is 100% developed and owned by Magnolia LNG, LLC's parent company, Liquefied Natural Gas Limited.

OWNER

Magnolia LNG, LLC, a wholly owned subsidiary of Liquefied Natural Gas Limited (www.lnglimited.com.au), GPO Box 920, West Perth WA 6872 Australia

INITIAL INVESTMENT

\$2.2 billion, for Phase 1 of the Project comprising two LNG Trains, each of 2 mtpa LNG production capacity.

JOBS

Based on estimates by Magnolia LNG, LLC and the Louisiana Department of Economic Development Phase 1 of the Project will generate approximately 1,000 construction jobs, 45 permanent direct jobs and an additional 175 indirect jobs, and provide significant economic benefits for the State of Louisiana and the United States of America.

SCHEDULE

Magnolia LNG, LLC, is targeting commencement of construction in 2015 and initial start-up of operations in late 2017.

CONTACT

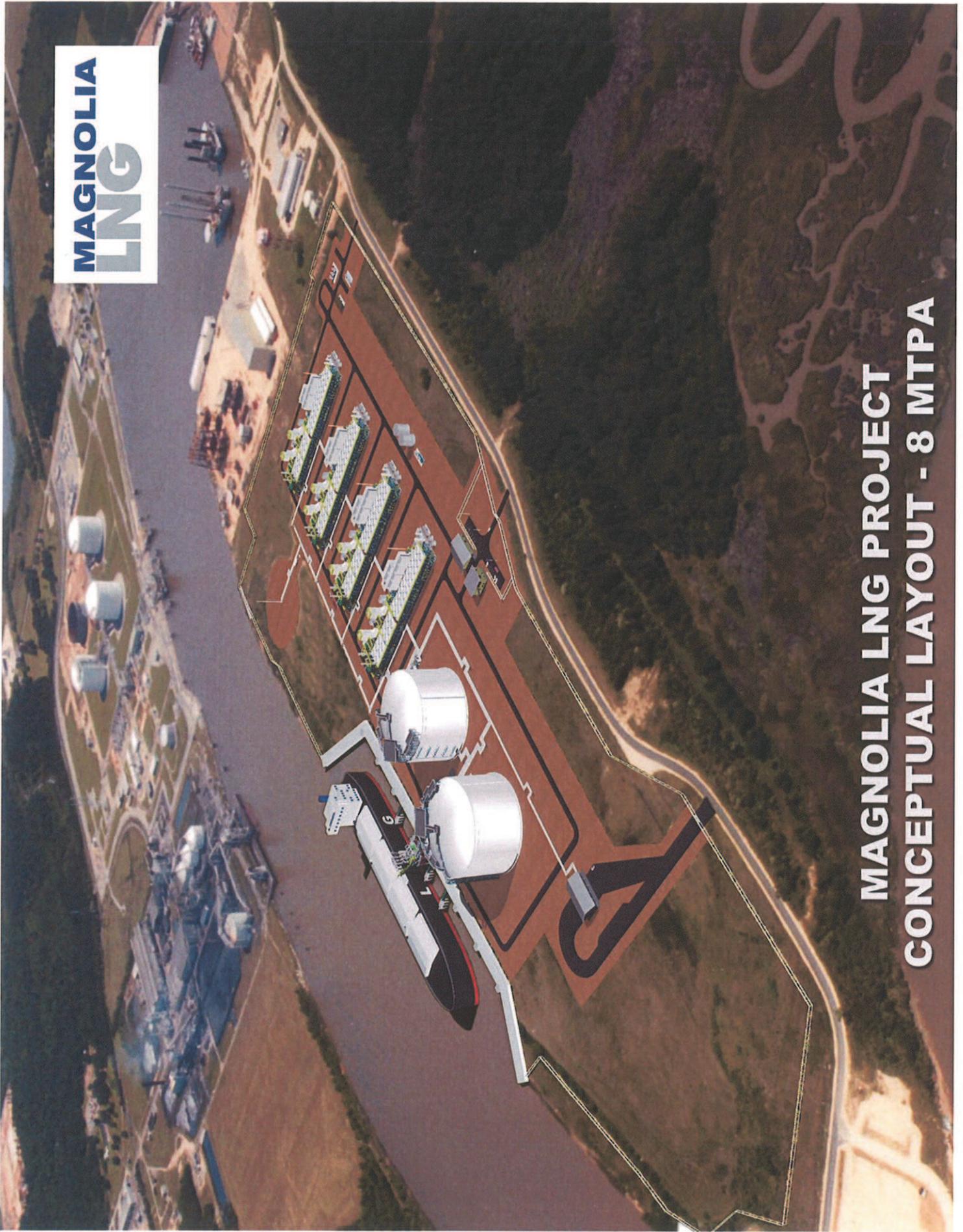
Ernie Megginson

VP-Project Management
Magnolia LNG, LLC

Email: emegginson@lnglimited.com.au

616 Broad Street | Lake Charles, LA 70601

**MAGNOLIA
LNG**



**MAGNOLIA LNG PROJECT
CONCEPTUAL LAYOUT - 8 MTPA**

MAGNOLIA LNG

PROJECT OVERVIEW

Total Capital Cost (Phase 1)
US\$ 2.2 Billion

Estimated Construction Jobs **1,000**

Estimated Direct Employment **45**

Estimated Indirect Employment **175**

**Phase 1 (4 mtpa) focused on
Domestic and FTA Markets**

Construction Start
Mid-2015

Operations Start
Late 2017



MAGNOLIALNG.COM

MAGNOLIA LNG

FREQUENTLY ASKED QUESTIONS

What is LNG?

- Liquefied natural gas (LNG) is natural gas in its liquid form.
- Cooled to -260°F , LNG is a clear, colorless, odorless, non-corrosive, non-toxic liquid.
- Primarily methane, with low concentrations of other hydrocarbons, water, carbon dioxide, nitrogen and some sulphur compounds.
- Sometimes confused with LPG (liquefied petroleum gas), which is used for domestic and commercial applications. LPG is kept liquid by confining under high pressure; LNG is kept liquid at normal atmospheric pressure by maintaining a very low temperature.

How is LNG used?

- Before LNG can be used, it must be converted back into a gas (regasification).
- After regasification, supplied to households, power stations and other industrial consumers through pipelines.
- LNG in liquid form used as cleaner alternative transportation fuel.



Why use LNG?

- Natural gas is the cleanest-burning fossil fuel, producing less emissions and pollutants than coal or oil.
- Occupies only 1/600th of the volume of natural gas; more economical to transport; can be stored in larger quantities.

How is LNG stored?

- Stored in large insulated tanks consisting of an inner tank and outer tank, with a special insulating layer between.

How is LNG transported?

- Transported in double-hulled ships designed specifically to handle the low temperature of LNG.
- LNG weighs less than half the weight of water so it will float if spilled on water, quickly boiling off and dissipating into the atmosphere, leaving no residue. No environmental clean-up is needed for an LNG spill on water.

Is LNG flammable?

- As a liquid, LNG is not flammable. Vaporized LNG is only flammable if its concentration is within 5%–15% natural gas with air.



Is LNG explosive?

- As a liquid, LNG is not explosive. LNG vapors (methane) mixed with air are not explosive in an unconfined environment. LNG vapor will explode only if in a confined space, and only if within the flammable range of 5% to 15% natural gas with air.

How safe are LNG ships and LNG terminals?

- The LNG industry has an excellent safety record thanks to the safe properties of LNG and the stringent enforcement of standards, codes and guidelines applying to LNG.
- To date there have been more than 50,000 transported shipments by LNG tankers, covering more than 70 million nautical miles, without a single significant accident or safety problem, neither in a port nor at sea.

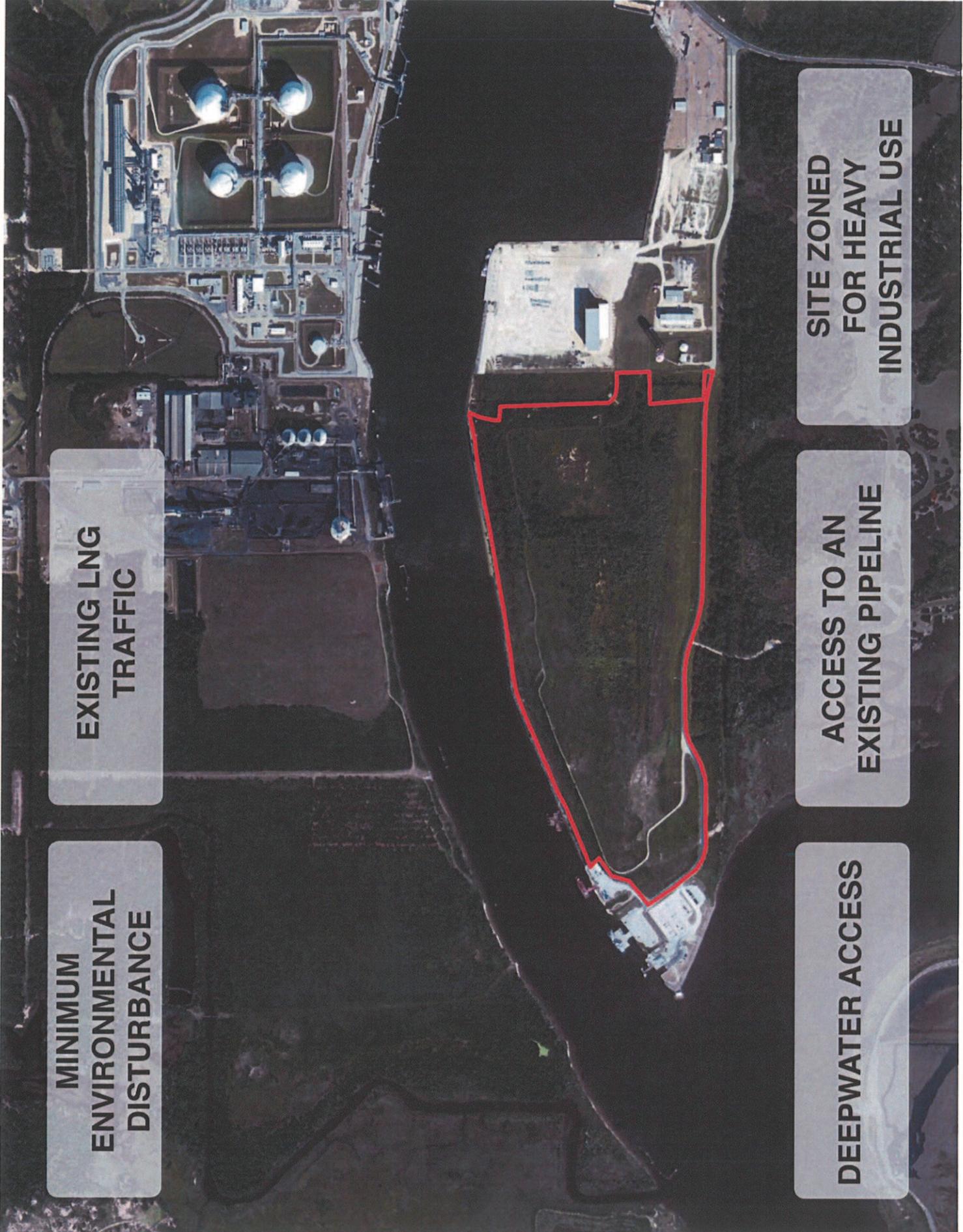
How secure are LNG ships and LNG facilities?

- The LNG industry adheres to stringent security procedures for its ships and facilities. The industry carefully follows requirements set forth by the International Maritime Organization, Federal Energy Regulatory Commission, Department of Transportation, and the U.S. Coast Guard and works closely with the Department of Homeland Security to ensure that its operations are safe and secure.

Source: www.LNGFacts.org

The LNG Industry in General

- This industry has an excellent safety record spanning many decades.
- LNG terminals (export and import) are located all over the world.
- There are over 80 LNG reception terminals and approximately 30 LNG liquefaction plants in operation worldwide, with over 40 planned new and expanded LNG terminals, and more than 30 planned liquefaction plants and expansions.



MINIMUM ENVIRONMENTAL DISTURBANCE

EXISTING LNG TRAFFIC

DEEPWATER ACCESS

ACCESS TO AN EXISTING PIPELINE

SITE ZONED FOR HEAVY INDUSTRIAL USE

LIQUEFACTION TECHNOLOGIES

Large Scale Liquefaction Technology (>3 mtpa)

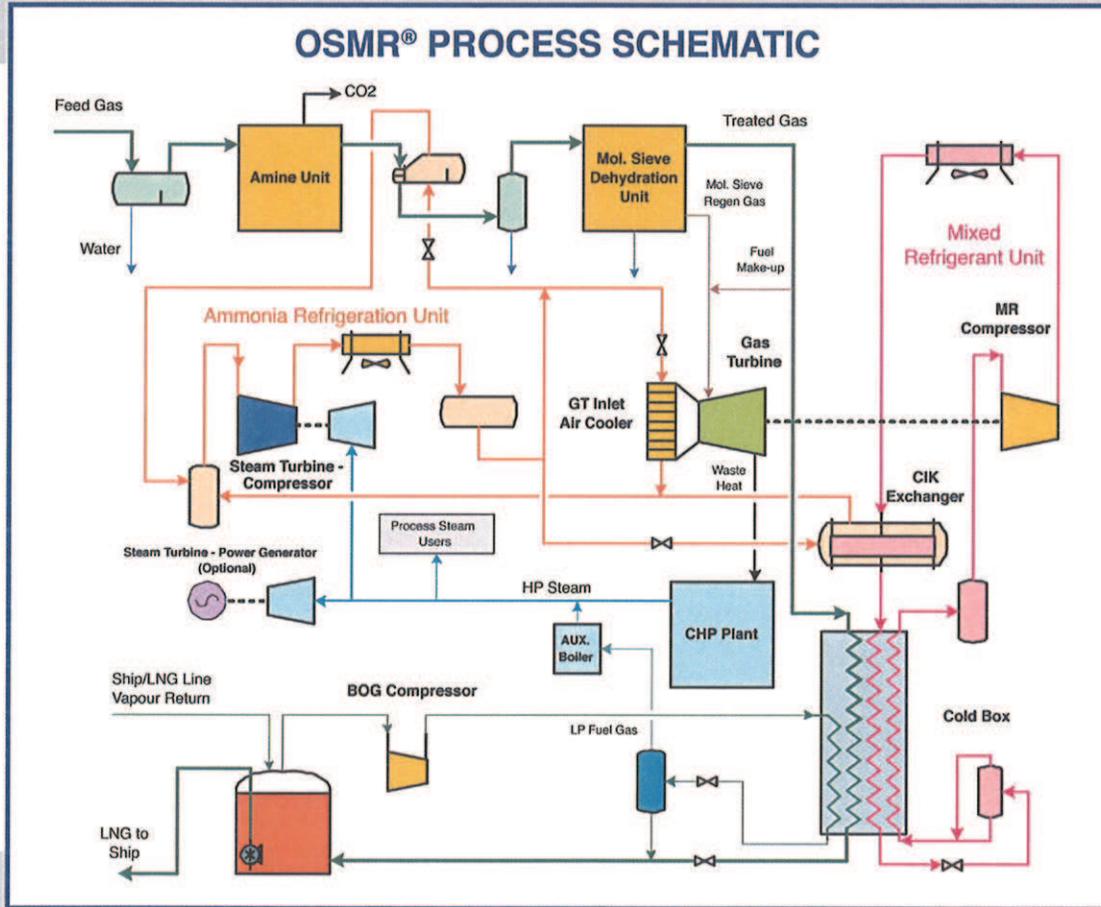
ConocoPhillips – Cascade Process
API – C3MR Process
Shell – Dual MR

Medium Scale Liquefaction Technology (1-3 mtpa)

LNG Limited – OSMR® Process

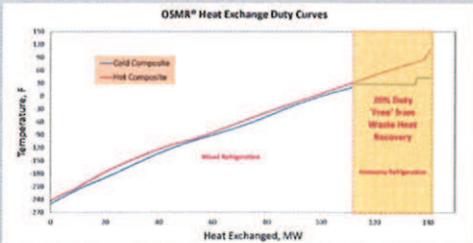
Small Scale Liquefaction Technology (< 1 mtpa)

Black & Veatch – PRICO – SMR Process
Hamworthy – N2 Expansion



MAGNOLIA
LNG

OSMR® COOLING CURVE



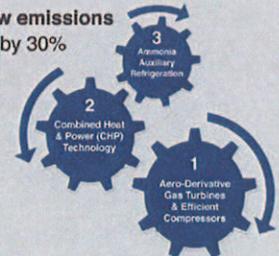
OSMR® BENEFITS

Simplicity in design, construction and operation

- Faster construction
- Proven technology
- Reduced capital requirement
- Location flexibility
- Less footprint required
- Simple start-up & operation
- Low turndown

High efficiency and low emissions

- Improved efficiency by 30%
- Better economics
- Reduced emissions



MAGNOLIA LNG

PARTIAL LIST OF SUBJECTS IN ENVIRONMENTAL STUDY

AIR EMISSIONS

WATER DISCHARGES

WATER USE

WATER QUALITY

STORM WATER RUN OFF

WETLANDS IMPACTS

DREDGING AND SPOIL PLACEMENT

WILDLIFE AND PROTECTED SPECIES

FISHERIES

LAND USE, RECREATION, AND AESTHETICS

CULTURAL RESOURCES AND HISTORIC PRESERVATION

SOCIAL AND SOCIOECONOMIC IMPACTS

SOILS AND GEOLOGY

SEISMIC ACTIVITY

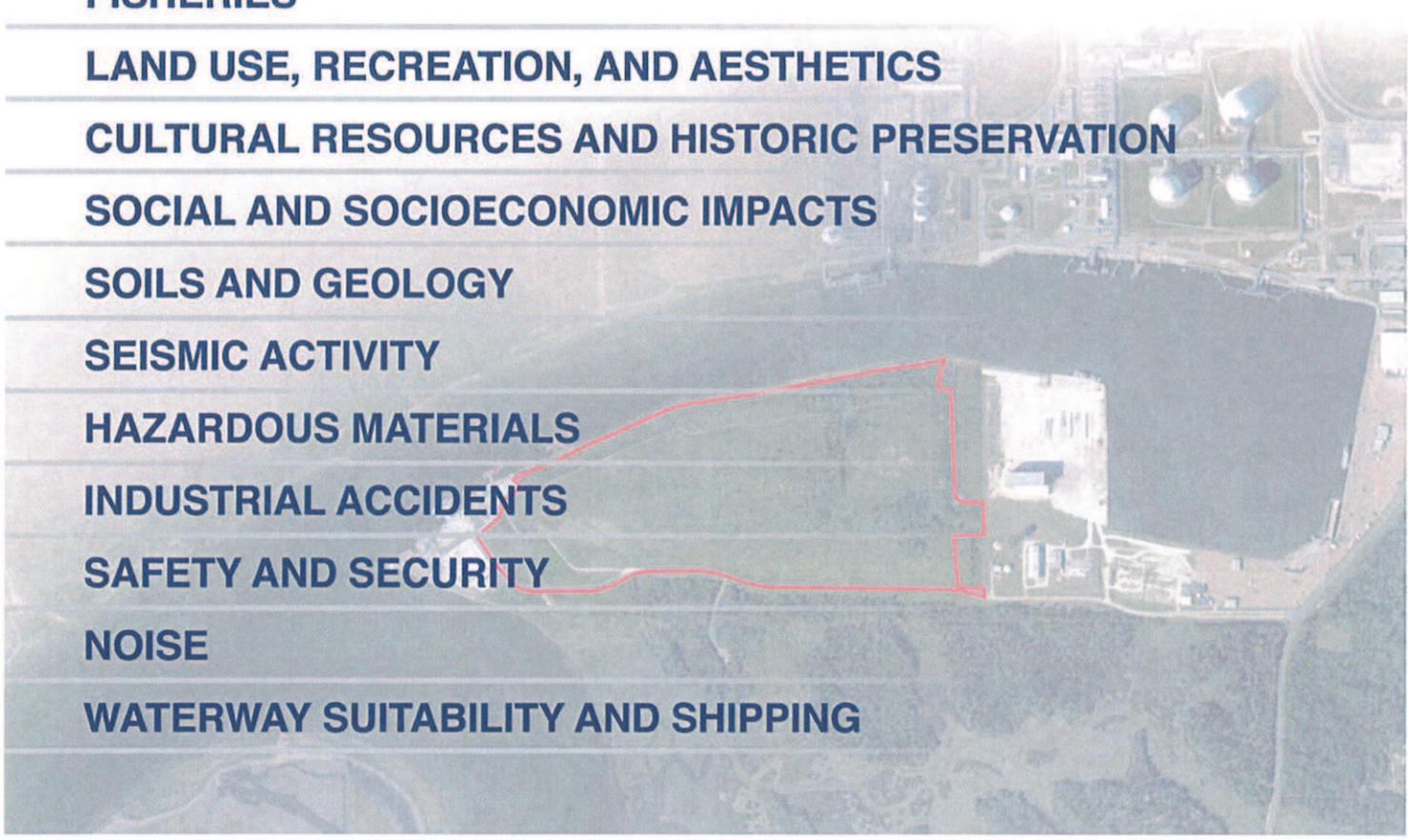
HAZARDOUS MATERIALS

INDUSTRIAL ACCIDENTS

SAFETY AND SECURITY

NOISE

WATERWAY SUITABILITY AND SHIPPING



MAGNOLIA LNG

MAJOR AGENCY ROLES IN ENVIRONMENTAL AND SAFETY REVIEW

FEDERAL AGENCIES

Federal Energy Regulatory Commission

Order Granting Section 3 Authorization

National Oceanic & Atmospheric Administration: National Marine Fisheries Service

Consultation on essential fish habitat, sea turtles in the water, marine mammals, marine fisheries and other protected marine species under agency jurisdiction

U.S. Army Corps of Engineers

Section 10/404 Dredge and Fill Permit

U.S. Coast Guard

Letter of Recommendation for suitability of waterway for LNG marine traffic

U.S. Department of Interior, Fish and Wildlife Service

Consultation on migratory birds, bald and golden eagles, sea turtles on the beach, and other protected species under agency jurisdiction

U.S. Department of Transportation: Pipeline and Hazardous Materials Safety Administration

Applies and enforces federal safety regulations related to LNG facilities

STATE AGENCIES

Louisiana Department of Environmental Quality

Process air emissions permits, water discharge permits, storm water control permits

Louisiana Department of Natural Resources

Consider state Coastal Zone Management policies; evaluate project location inside/outside coastal zone; process Coastal Use Permit-when applicable

Louisiana Department of Wildlife and Fisheries

Consultation on fisheries and state protected wildlife

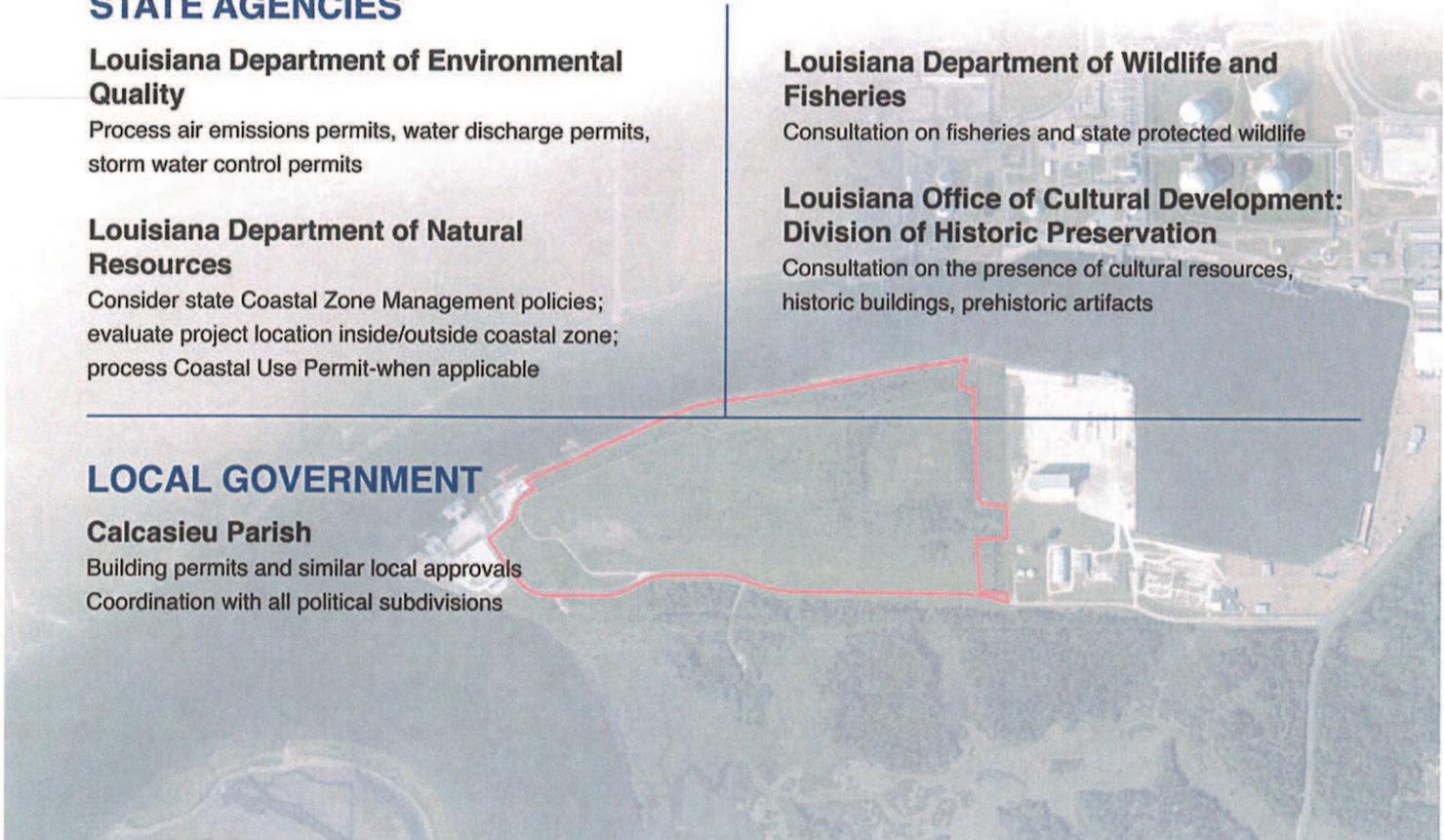
Louisiana Office of Cultural Development: Division of Historic Preservation

Consultation on the presence of cultural resources, historic buildings, prehistoric artifacts

LOCAL GOVERNMENT

Calcasieu Parish

Building permits and similar local approvals
Coordination with all political subdivisions



Endesa Buys More LNG from Cheniere

Posted on Apr 8th, 2014 with tags [Buys](#), [Cheniere](#), [Endesa](#), [LNG](#), [News](#) .



Cheniere Energy’s unit Corpus Christi Liquefaction has entered into an LNG sale and purchase agreement with Endesa under which the Spanish company has agreed to purchase approximately 0.75 million tonnes per annum of LNG. The SPA is in addition to the previously signed SPA under which Endesa will purchase approximately 1.5 mtpa of LNG, bringing the total quantity of LNG sold to Endesa under the two agreements to approximately 2.25 mtpa.

The Corpus Christi Liquefaction project is being designed and permitted for up to three trains, with aggregate design production capacity of 13.5 mtpa of LNG.

Under the SPA, Endesa will purchase LNG on an FOB basis for a purchase price indexed to the monthly Henry Hub price plus a fixed component. LNG will be loaded onto Endesa’s vessels. The SPA has a term of twenty years commencing upon the date of first commercial delivery and an extension option of up to ten years. Deliveries are expected to occur as early as 2018.

*“Endesa has agreed to purchase an additional 0.75 mtpa from the Corpus Christi Liquefaction Project for use by their Italian parent company Enel,” said **Charif Souki, Chairman and CEO.** “We have now entered into a total of approximately 3 mtpa of SPAs at the project, completing the SPAs for Train 1. We continue to work towards finalizing additional agreements and expect*

to complete all necessary steps to reach a final investment decision and begin construction by early 2015.”

Press Release, April 08, 2014; Image: Cheniere

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March 24, 2014

U.S. approves Veresen's LNG project in Oregon

By BRENT JANG

Terminal in Oregon will be supplied with Canadian natural gas to ship to Asia

The U.S. Department of Energy has approved an application to export liquefied natural gas from a proposed Oregon terminal that would tap into resources that originate in Canada.

The Jordan Cove LNG project, owned by an arm of Calgary-based Veresen Inc., will rely heavily on natural gas supplies to be transported through an existing pipeline network from Western Canada to Oregon.

Plans also call for building the 370-kilometre Pacific Connector feeder pipeline, co-owned by Veresen and Williams Companies Inc. of Tulsa, Okla., in an effort to bring in natural gas from suppliers in Wyoming and Colorado.

Veresen wants to export LNG to Asian customers in a fierce energy race on North America's West Coast. Rivals include one other U.S. Pacific Northwest project, Oregon LNG Marketing Co. LLC, and at least 14 B.C. LNG proposals. There is also global competition to export LNG to Asia, including from Qatar, Australia and Nigeria.

So far, Cheniere Energy Inc.'s Sabine Pass LNG project in Louisiana is the only LNG export project under construction in North America. Jordan Cove and five other U.S. proposals are awaiting approval from the U.S. Federal Energy Regulatory Commission.

Several B.C. LNG projects have been spending millions of dollars on site preparation and other costly preliminary planning, but none of the proponents have made final investment decisions.

Environmentalists and local residents oppose the Jordan Cove project in southern Oregon, but its backers point to economic benefits. Veresen chief executive officer Don Althoff said Monday that Jordan Cove will generate much-needed jobs and provide tax revenue to the Oregon government.

Last month, Canada's National Energy Board approved Jordan Cove's 25-year licence application to export up to 1.55 billion cubic feet a day of natural gas from Western Canada to the U.S.

Veresen said the Canadian natural gas will help supply the Oregon terminal to be constructed at Coos Bay. The LNG production launch is slated for early 2019.

The U.S. Department of Energy's 20-year authorization allows Jordan Cove to export nearly six million tonnes annually of LNG, subject to final regulatory approval. The department said it "considered the economic, energy security and environmental impacts" before giving its blessing Monday for Jordan Cove to export LNG to countries that do not have free-trade agreements with the United States. Jordan Cove needs to secure Asian customers to take delivery of LNG.

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