Deepwater Port License Application
Blue Marlin Offshore Port (BMOP) Project

Volume IIa – Offshore Project Components Environmental Evaluation (Public)
Topic Report 11: Meteorology, Air Quality, and Noise

Submitted to:

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Deepwater Port License Application
Blue Marlin Offshore Port (BMOP) Project

Volume I:	General (Public), including Deepwater Port License Application and Appendices (*under separate cover*)
Volume IIa:	**Offshore Project Components Environmental Evaluation (Public)** **(*herein*)**
Volume IIb:	Onshore Project Components, Environmental Evaluation (Public) (*under separate cover*)
Volume III:	Technical Information [***Confidential***] (*under separate cover*)
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ABBREVIATIONS AND ACRONYMS

Applicant	Blue Marlin Offshore Port LLC
ATWS	Additional Temporary Workspace
ARL	Air Resource Laboratory
BACT	Best Available Control Technology
BES	Benchmark Ecological Services, Inc.
BMOP	Blue Marlin Offshore Port
BMPs	Best Management Practices
bph	barrels per hour
CAA	Clean Air Act
CALM	Catenary Anchor Leg Mooring
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CI	Compression ignition
CO	Carbon monoxide
CO2e	carbon dioxide equivalent
CPMS	continuous parameter monitoring system
dB	Decibel
dBA	A-weighted decibel
dB RMS	Rootmean sound pressure level
DWP	Deepwater Port
DWPA	Deepwater Port Act
ECOS	Environmental Conservation Online System
EPA	United States Environmental Protection Agency
ESA	Endangered Species Act
FERC	Federal Energy Regulatory Commission
FR	Federal Register
GARFO	Greater Atlantic Regional Fisheries Office
GOM	Gulf of Mexico
GHG	Greenhouse gas
HAP	Hazardous Air Pollutant
HDD	Horizontal directional drill
HGB	Houston-Galveston-Brazoria
hp	Horsepower
HYSPLIT	Hybrid Single-Particle Lagrangian Integrated Trajectory
ICE	Internal combustion engine
Ldn	day-night average sound level
Leq	equivalent continuous sound level
Lmax	Maximum sound level during a measurement period or noise event
LwA	A-weighted sound power
LDEQ	Louisiana Department of Environmental Quality
LQ	living quarters

m3	cubic meters
MACT	Maximum Achievable Control Technology
MARAD	United States Maritime Administration
MLV	Mainline valve
MMBtu/hr	million British thermal units per hour
MP	Milepost
NAAQS	National Ambient Air Quality Standards
NPDES	National Pollutant Discharge Elimination System
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NMHC	Non-methane hydrocarbon
NNSR	Nonattainment New Source Review
NO_2	Nitro dioxide
NOAA	National Oceanic and Atmospheric Administration
NSA	Noise sensitive area
NSPS	New Source Performance Standard
NSR	New Source Review
NT	Nederland Terminal
NTS	not-to-exceed
O_3	Ozone
OCS	Outer Continental Shelf
OLD	organic liquids distribution
Pb	Lead
PLEM	Pipeline end manifold
PM	Particulate matter
ppb	parts per billion
ppm	parts per million
ppmvd	parts per million volumetric, dry
Project	Blue Marlin Offshore Port (BMOP)
PSD	Prevention of Significant Deterioration
psia	pounds per square inch absolute
RICE	Reciprocating Internal Combustion Engine
ROW	Right-of-way
SH	State Highway
SIP	State Implementation Plan
SO_2	Sulfur dioxide
SPAR	Spill Prevention and Response
TAP	Toxic Air Pollutant
TCEQ	Texas Commission of Environmental Quality
TOPAZ	Tunable Optical Profiler for Aerosol and oZone lidar
tpy	tons per year
$\mu g/m^3$	micrograms per cubic meter
TVP	true vapor pressure
U.S.	United States

USC	United States Code
USCG	United States Coast Guard
USDOT	United States Department of Transportation
VBT	Vent Boom Tripod
VHAP	Volatile hazardous air pollutant
VLCC	Very Large Crude Carriers
VOC	Volatile Organic Compound
WC 433	West Cameron Lease Block 433
WC 509	West Cameron Lease Block 509

PROJECT FAST FACTS

General Project Terminology	
Applicant	Blue Marlin Offshore Port LLC
Project Name	Blue Marlin Offshore Port (BMOP)

BMOP Location and General Information	
Nederland Terminal (NT)	The location where the oil for BMOP originates. This is the existing Sunoco Partners Marketing & Terminals L.P. facility located in Nederland, Jefferson County, Texas
New 42-inch Pipeline	37.02 miles of 42-inch pipeline from NT to Station 501
Existing Mainline from Cameron parish Louisiana to WC 509	Cameron Parish, Louisiana Louisiana State Blocks: WC 11, 20, 21 OCS Blocks: WC 21, 44, 43, 58, 79, 78, 95, 114, 113, 132, 133, 148, 169, 170, 183, 196, 205, 212, 213, 224, 230, 241, 245, 246, 255, 258, 259, 266, 269, 276, 275, 277, 282, 408, 431, 432, 433, 456, 459, 482, 483, 484, 508, 509
Deepwater Port Location (Platform – CALM Buoys)	West Cameron Block 509 (WC 509) West Cameron 508 (WC 508) East Cameron 263 (EC 263)
Deepwater Port Water Depth	156 to 162 feet water depth
Loading Capacity	80,000 barrels per hour (bph)

BMOP Deepwater Port Components	
Existing Stingray Pipeline (Mainline)	One existing 36-inch Outer Diameter (OD) pipeline, approximately 104 miles long from Station 501 in Cameron Parish, Louisiana to WC 509. This line consists of the existing 36-inch OD subsea line from WC 509 to Station 701 and the existing 36-inch OD onshore line from Station 501 to Station 701.
Deep Water Port (DWP)	The offshore loading facility site located in WC 509, WC 508, and EC 263. The facilities consist of the existing WC 509 Platform Complex; two new PLEMs and CALM Buoys in WC 508 and EC 263; two new Crude Oil Loading Pipelines from the WC 509 Platform Complex to the PLEMs and the flexible hoses attached to the CALM Buoys. The WC 509 Platform Complex will be converted from gas service to oil and gas service. The converted platforms will support oil export and natural gas transportation.
WC 509 Platform Complex (509 Complex)	The existing WC 509 Platform Complex consists of three platforms and two Vent Boom Tripods (VBT). The WC 509A Platform is the natural gas gathering platform. This will also house the 36-inch riser and pig barrel of the crude oil Mainline. The WC 509B Platform currently is the natural gas compression and control platform. It houses natural gas compressors, separators, the Control Room and Platform Complex's utilities. The WC 509B Platform will continue to house the natural gas separation facilities and the Platform Complex's utilities. It will also house the crude oil Control Room, metering facilities, and pig barrels for the two Crude Oil Loading Lines. The WC 509C Platform is the Living Quarters (LQ) platform and will continue in that role. The WC 509 VBTs are utilized to bridge the natural gas vent piping to a point approximately 660 feet from the 509B Platform and will continue in this role for any planned and emergency natural gas blowdowns.

BMOP Deepwater Port Components	
WC 148 Platform	The existing WC 148 Platform will be converted from natural gas transportation service to oil transportation service. All gas piping facilities on the deck will be removed and replaced with new pipe and a new Mainline Valve (MLV). This valve will be able to be remotely operated.
Catenary Anchor Leg Mooring (CALM) System	There will be two floating Calm Buoys installed approximately 4,710 feet and 6,085 feet from the WC 509B Platform. The CALM Buoys will be installed with a minimum of 5,000 feet separation. Each Buoy will be moored in place with 6 or more anchor chains connected to engineered anchors installed at locations around the Buoy. Flexible hoses will be connected from the PLEMs to the Calm Buoys. Floating flexible hoses will also be connected to the CALM Buoy and, during loading, the opposite end will be connected to the ship. CALM Buoy No. 1 will be installed in WC 508 and CALM Buoy No. 2 will be installed in EC 263.
Crude Oil Loading Pipelines	Two 36-inch diameter pipelines from the existing WC 509B Platform to the PLEMs.
Pipeline End Manifold (PLEM)	One PLEM will be installed on the seafloor at each CALM Buoy. Each PLEM will be connected to a 36-inch Crude Oil Loading Pipeline from the WC 509B Platform and a CALM Buoy floating above the PLEM. The two PLEMs will be in WC 508 and EC 263.
VLCC or other Crude Carrier	Very Large Crude Carriers (VLCCs), Suezmax, Aframax or other large capacity seafaring vessels.
Meter for Measuring Departing Crude Oil	The DWP will have two-meter stations with associated prover and lab facilities. One of the meter stations will be located at the new BMOP Pump Station adjacent to the NT and one will be located on the offshore crude export platform (WC 509B Platform).
Pre-fabrication Yards	Existing yards will be used along the northern Gulf of Mexico (GOM) coast.
Support Facility	An onshore support base will be established at an existing port facility to provide the necessary security to support the DWP operations.

BMOP Onshore Pipeline Components	
BMOP Pump Station	The onshore metering, pumping, and pig launcher station will be located in Nederland, Texas, adjacent to the existing NT.
Onshore Crude Oil Pipeline	A new, approximate 37.02-mile, 42-inch OD pipeline connecting the existing NT in Jefferson County, extending across Orange County, Texas to the existing 36-inch OD Mainline at Station 501 in Cameron Parish, Louisiana.
Station 501	The existing NGPL/Stingray interconnect facility (Station 501) will be abandoned and demolished. A new pig receiver and launcher will be installed to connect the new 42-inch OD onshore pipeline with the existing 36-inch OD onshore Stingray Mainline.
Station 701	The existing compressor Station 701 in Cameron Parish, Louisiana will be demolished. All existing natural gas equipment will be removed from the Station except for several large 10,000-barrel storage tanks. Approximately 1,000 feet of new 36-inch pipe, surge tanks, surge valves, and a new MLV will be installed. . The existing 10,000-barrel tanks located at Station 701 will be converted to surge relief tanks.
Stingray ANR Tap Removal Site	BMOP will remove the tap and install 36-inch pipe in its place.

BMOP Onshore Pipeline Components	
Mainline Valves (MLV)	Six new MLVs will be installed within the permanent pipeline right-of-way (ROW) of the new build pipeline. MLVs will also be installed at the BMOP Pump Station, Station 501, and Station 701. These valves will be used for isolation and spill control purposes.
Pipeline Pig Launchers and Receivers	Pig Launchers/Receivers will be located at the BMOP Pump Station, Station 501, and the DWP. These are utilized for cleaning the pipelines and running intelligent devices to assess pipeline integrity.
Access Roads and Canals	The Project will utilize existing access roads and canals. One new temporary access road and four new permanent access roads will be required.
Pipe and Contractor Yards	BMOP will utilize existing facilities along the northern GOM coast, U.S. or international locations for manufacturing pipe and for fabricating the PLEMs, CALM Buoys, and end connectors. Pipe coating activities will be performed at existing facilities along the northern GOM coast. Selection of the marine contractor will be completed after the MARAD filing; however, the successful contractor(s) will utilize existing fabrication and logistical facilities located along the northern GOM coast.

Environmental Evaluation Assessment Criteria		
Criteria	**Values**	**Definition**
Outcome	**Direct**	***Direct effects*** are "caused by the action and occur at the same time and place" of the Project (40 CFR § 1508.8).
	Indirect	***Indirect effects*** are "caused by an action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect impacts may include growth inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems, including ecosystems" (40 CFR § 1508.8). Indirect impacts are caused by the Project, but do not occur at the same time or place as the direct impacts.
	Cumulative	***Cumulative impact*** is "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR § 1508.7).
Type	**Adverse (Negative)**	***Adverse*** would cause unfavorable or undesirable outcomes for the natural or social environment. Negative impacts result in a net loss to the resource.
	Beneficial (Positive)	***Beneficial*** impact would cause positive or desirable outcomes for the natural or social environment. Beneficial impacts result in a net benefit to the resource.
Duration	**Short-term (Temporary)**	***Short-term (or temporary)*** impacts are those that would occur only during a specific phase of the proposed Project, such as noise during construction or certain installation activities. Short-term impacts would end at the time, or shortly after, construction activities ceased. The duration of most short-term impacts would be a few hours to a few days.
	Long-term	***Long-term*** impacts would occur either continually or periodically throughout the life of the Project (e.g., operational air emissions, stormwater discharge), or would last for years after an impact-producing activity occurred (e.g., removal of wildlife habitat).
Magnitude	**Negligible**	***Negligible*** impacts are generally those that might be perceptible, but in certain cases may be undetectable.
	Minor	***Minor*** effects are those that could be perceptible but are of very low intensity and may be too small to measure.
	Moderate	***Moderate*** impacts are more perceptible, can often be quantified, and may approach the thresholds for major impacts.
	Major	***Major*** impacts, based on their context and intensity (or severity), have the potential to meet the thresholds for significance set forth in CEQ regulations (40 CFR § 1508.27). Major impacts warrant additional attention in a NEPA analysis and a review of potential mitigation measures that would fulfill the policies set forth in NEPA, which include avoiding, minimizing, or mitigating major impacts.
Likelihood	**Unlikely**	Low probability.
	Potential	Potential or probable.
	Likely	Certain.

11.0 METEOROLOGY, AIR QUALITY, AND NOISE

11.1 PROJECT OVERVIEW

Blue Marlin Offshore Port LLC (the Applicant) is proposing to develop the Blue Marlin Offshore Port (BMOP) Project (Project) in the Gulf of Mexico (GOM) to provide crude oil transportation and loading services for crude oil produced in the continental United States (U.S.). A Project overview map is provided in **Figure 11-1**. The Deepwater Port (DWP) will be utilized to load the transported crude oil onto very large crude carriers (VLCCs) (and other crude oil carriers) for export to the global market. The Applicant is filing this application for a license to construct, own, and operate the DWP pursuant to the Deepwater Port Act (DWPA) of 1974, as amended, and in accordance with U.S. Coast Guard (USCG) and U.S. Maritime Administration (MARAD) implementing regulations.

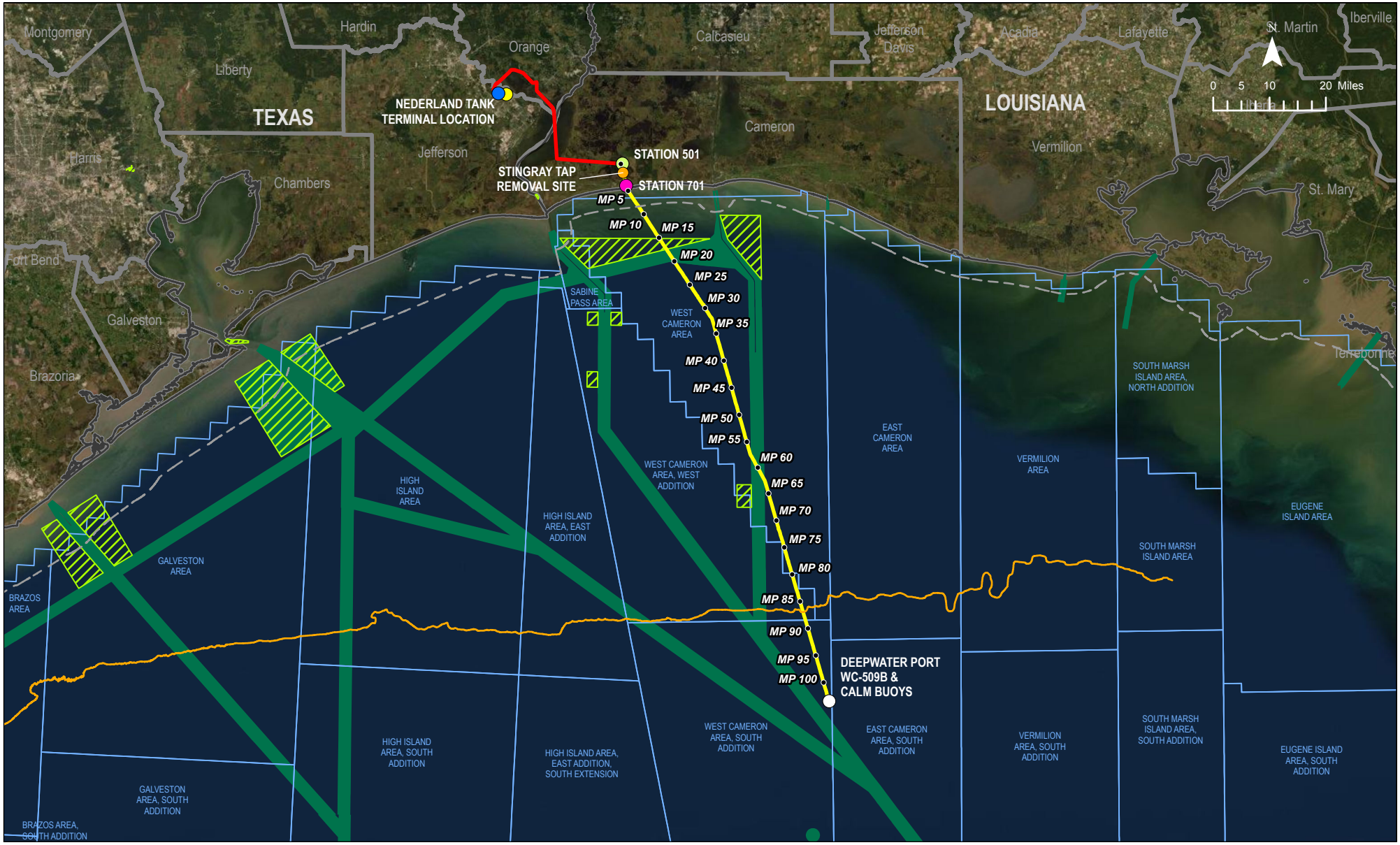
The primary purpose of the Project will be to provide for safe and reliable long-term supply of crude oil for export to the global market. Oil for export will be transported out of the existing Sunoco Partners Marketing and Terminals, L.P. terminal and storage facility in Jefferson County, Texas (Nederland Terminal or NT). This terminal is connected to multiple crude oil pipelines connecting to production from across the U.S. In addition, an affiliate of the Applicant owns the Stingray Pipeline System and has confirmed that its subsea pipeline and offshore platforms are suitable for converting to facilitate crude oil export from a DWP in the northern GOM. The Applicant has the exclusive right to lease or purchase the Stingray Pipeline System for use in the Project.

The DWP will be located in federal waters within and adjacent to the Outer Continental Shelf (OCS) in West Cameron Lease Blocks (WC) 509 and 508 and East Cameron (EC) Block 263. Following the existing Stingray pipeline, the DWP will be approximately 99 statute miles off the coast of Cameron Parish, Louisiana, with an approximate water depth of 162 feet. Crude oil will be routed from pumps at Nederland, through a new 42-inch outer diameter (OD) onshore pipeline to the existing Stingray Mainline at Station 501, and from there through the existing Stingray Mainline to the DWP. The crude oil will be metered at the BMOP Pump Station at the NT and on the existing WC 509B Platform and routed through two Crude Oil Loading Lines to Pipeline End Manifolds (PLEMs) located on the seafloor below two Catenary Anchor Leg Mooring (CALM) Buoys located in WC 508 and in EC 263. From each PLEM, the crude oil will be routed to its respective floating CALM Buoy through submerged flexible hoses. VLCCs (or other large seafaring crude oil vessels) will moor at a CALM Buoy, retrieve and connect the floating crude oil hoses connected to the CALM Buoy and the crude oil will then route from the Buoy to the VLCC for loading. Up to 365 VLCCs (or other crude oil carriers) will load per year.

In summary, the BMOP facilities consist of the pumps and meters at NT; a new approximate 37-mile, 42-inch OD pipeline; the existing 36-inch OD Mainline; an existing fixed, manned platform complex at WC 509; an existing platform at WC 148; two new Crude Oil Loading Pipelines; and two new PLEM and CALM Buoys located in WC 508 and EC 263. A schematic of the proposed DWP is provided in **Figure 11-2**. The crude oils that would be exported range from light to heavy grade crudes from the existing the NT facility.

This Topic Report identifies and discusses meteorology, air quality, and noise in the offshore Project area, the potential impacts of construction, operation, and decommissioning on ambient air and noise conditions, and measures that will be implemented to reduce and mitigate potential Project-related impacts. Offshore Project Mapping is provided in **Appendix A** (Volume IIa). Agency correspondence referenced within this report is provided in **Appendix B** (Volume IIa).

BMOP PROJECT - FIGURE 11-1 - PROJECT OVERVIEW MAP



LEGEND

- EXISTING OFFSHORE PIPELINE MILEPOSTS
- STINGRAY TAP REMOVAL SITE
- NEDERLAND TANK TERMINAL LOCATION
- NEDERLAND PUMP STATION
- STATION 701 (TO BE CONVERTED TO OIL SERVICE)
- STATION 501 (TO BE CONVERTED TO OIL SERVICE)
- DEEPWATER PORT WC-509B AND CALM BUOYS
- EXISTING PIPELINE TO BE CONVERTED TO OIL SERVICE
- PROPOSED ONSHORE PIPELINE (NEW BUILD)
- DEPTH CONTOUR -108'
- STATE WATERS BOUNDARY
- SAFETY ANCHORAGES
- PROTRACTION AREA
- SHIPPING FAIRWAY
- COUNTY / PARISH
- STATE BOUNDARY

BLUE MARLIN OFFSHORE PORT PROJECT

PROJECT OVERVIEW MAP

COUNTY/PARISH:	VARIOUS	DRAWN BY:	CA
STATE:	TX/LA	CHECKED BY:	CW

DATE:	2020/09/17	PROJECTION:	NAD 1983 UTM Zone 15N

PREPARED BY

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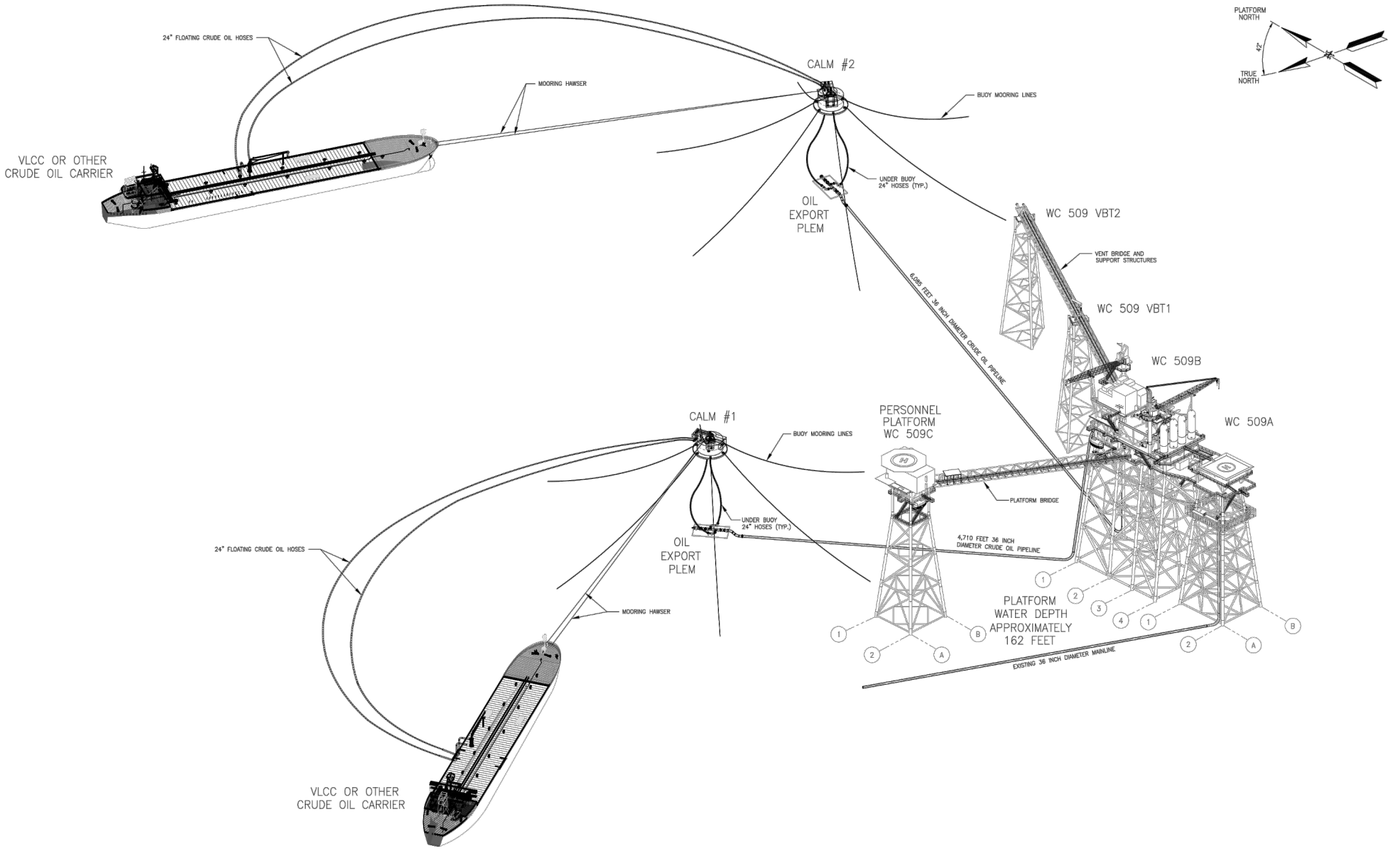
BLUE MARLIN OFFSHORE PORT PROJECT
FIGURE 11-1

DWG:	0802-01-005	SHEET:	1 OF 1

FIGURE 11-2 - BMOP DWP SCHEMATIC WITH VLCCs



11.1.1 Abandonment and Conversion of Existing Facilities

The Stingray Pipeline is currently comprised of a 36-inch pipeline (Mainline) that is fed natural gas and natural gas liquids by multiple lateral pipelines from various suppliers and producers. Stingray transports natural gas and liquids on the Mainline from the WC 509 Platform Complex to the onshore compressor station facility (Station 701) near Holly Beach in Cameron, Louisiana, and northward approximately four additional miles to the Natural Gas Pipeline Co. (NGPL)/Stingray interconnect (Station 501). The Stingray facilities from WC 509 to Station 501 will be abandoned through a FERC 7(b) Order and converted to use as DWP facilities (the filing has been made for abandonment). The Applicant intends to use all existing records and inspection data and perform additional engineering studies to obtain the appropriate agency approvals for converting all existing, reusable facilities. This includes updating the facilities to meet current regulations and guidelines, where appropriate. Abandonment under FERC 7(b) will be considered complete when the Mainline is completely isolated from all-natural gas sources and all-natural gas and produced liquids have been removed from the pipeline This work will be completed by Stingray. Stingray will assign the existing right-of-way (ROW) Grant (and associated facilities—platforms at WC 148 and WC 509) to BMOP or another affiliate of ET for use in the BMOP Project. The Applicant intends to operate the new facilities under 49 Code of Federal Regulations (CFR) Part 195.

Conversion of the Stingray facilities involves converting service to crude oil and changing flow direction in the Mainline; converting the platform at WC 148, herein referred to as the WC 148 Platform, to crude oil service from natural gas service; and converting the platform complex at WC 509, herein referred to as the WC 509 Platform Complex, to crude oil and natural gas service.

11.1.2 Major Offshore Project Components

All facilities for the proposed BMOP Project will be designed, constructed, tested, operated, and maintained in accordance with the U.S. Department of Transportation (USDOT) regulations in 49 CFR Part 195 (Transportation of Hazardous Liquids by Pipeline) and other applicable federal and state regulations. The Project will consist of both onshore supply components and offshore/marine components. Offshore components are described below and depicted in **Figure 11-1**.

Conversion of Existing Facilities

- The existing Station 501 is located at approximate MP 37 of the new 42-inch pipeline in Cameron Parish, Louisiana. All existing natural gas-related equipment owned by BMOP will be removed from the Station and new pipeline facilities will be installed. The new 42-inch pipeline will tie into the existing 36-inch Mainline at the site. The conversion of Station 501 will be expanded to include:
    - New pig receiver for the new 42-inch pipeline termination;
    - New pig launcher for existing 36-inch Mainline; and
    - New MLV.
- The existing compressor Station 701 in Cameron Parish, Louisiana, will be demolished. All existing natural gas equipment will be removed from the Station except for two 10,000-barrel storage tanks. The new facility will maintain office space, a natural gas interconnect, and surge tanks. Approximately 1,500 feet of new pipe, surge tanks, surge valves, and a new MLV will be installed. The existing 10,000-barrel tanks located at Station 701 will be converted to surge relief tanks.
- The existing ANR Tap (Stingray Tap Removal Site) is located at approximately Stingray Mainline MP 1.61 on the Stingray Mainline in Cameron Parish, Louisiana (approximate MP 38.6 on the

BMOP pipeline system). BMOP will install a 36-inch OD pipe segment following removal of the tap.

- The existing Mainline from Station 501 to the WC 509 Platform Complex will be converted to crude oil service.
- The WC 148 Platform will be converted to crude oil service and a new mainline valve installed.
- The existing WC 509 Platform Complex will be converted from a gas transmission facility to a dual-purpose gas transmission and crude oil export facility. The existing equipment that will remain at the Platform Complex will include:
    - Existing natural gas piping and risers on WC 509A Platform;
    - Natural gas Vent Boom on WC 509 VBTs;
    - Natural gas separation facilities on WC 509B Platform;
    - and
    - Heliport and helicopter fuel tank on WC 509A Platform.

<u>New Offshore Facilities</u>

- Two new CALM Buoys installed, one in WC 508 (CALM Buoy No. 1) and the other in EC 263 (CALM Buoy No. 2). The CALM Buoys will be anchored to the seafloor via an engineered mooring system capable of accommodating mooring forces exerted by a VLCC or other large seafaring vessels during loading operations. Two 24-inch diameter floating hoses will be connected to each CALM Buoy. The hoses will be approximately 1,500 feet long and used for loading operations.
- Two new PLEMs installed and anchored on the seafloor under the CALM Buoys. Two 24-inch undersea flexible hoses will be connected to each PLEM and associated CALM Buoy.
- Two Crude Oil Loading Pipelines, approximately 4,710 feet long to PLEM / CALM Buoy No. 1 and 6,085 feet long to PLEM / CALM Buoy No. 2, installed from the WC 509 Platform Complex to the PLEM and CALM locations, one for each PLEM and CALM Buoy (see **Figure 11-2**). The pipelines will be installed with the top of pipe at least three feet below the natural seafloor.
- New MLV on WC 148 Platform;
- Two new 36-inch risers connected to the Crude Oil Loading Pipelines on WC 509B Platform;
- New control room on WC 509B Platform;
- Three new pig barrels, one on the WC 509A Platform and two on WC 509B Platform;
- Meter station for crude oil on the WC 509B Platform;
- New living quarters (LQ) and heliport on WC 509C Platform;
- Surge valves and tank on the WC 509B Platform; and
- New ancillary equipment for the 509 Platform Complex (e.g., power generators, instrument/utility air system, fuel tanks, ac units, freshwater makers, firewater system, seawater and freshwater system, sewage treatment unit, fuel gas system, diesel system, closed drain system, open drain system, hydraulic power unit, hypochlorite system, cranes, communications tower and system, radar) to support operation of the offshore facilities.

Offshore Support Facilities

Support facilities for the Project will include:

- Safety Zone - The Applicant is requesting that the USCG Captain of the Port establish a Safety Zone around the entire DWP operations area. The Safety Zone will only be open to entry for VLCCs or other crude oil carriers prepared for connection for loading of crude oil, and the necessary service vessels supporting that process.
- Anchorage area – Existing USCG-designated anchorage areas will be utilized for VLCCs (or other crude carriers) awaiting mooring at a CALM Buoy or if they must disconnect from the CALM Buoys for safety reasons.
- Support vessel mooring area – A designated Service Vessel Mooring Area will be established in proximity to the offshore WC 509 facilities.
- Temporary pre-fabrication yards – Component fabrication will occur at multiple existing fabrication facilities within the GOM coastal region.
- Support facilities – Facilities within the GOM coastal region providing support for offshore operations and maintenance activities (e.g., helicopters, supply vessels, work boats, equipment suppliers, and maintenance workers).

11.2 APPLICABLE LAWS AND REGULATIONS

The Project will be subject to certain federal and state air quality regulations. This section summarizes the air permitting requirements and key air quality and noise regulations that will apply to the operation of the offshore portions of the Project.

Specifically, the Project's applicability to air permitting programs such as New Source Review (NSR), federal emissions standards such as New Source Performance Standards (NSPS) and National Emissions Standards for Hazardous Air Pollutants (NESHAP), and applicable state air regulations are addressed.

11.2.1 Federal Permitting Programs

Federal permitting programs comprise requirements for construction of new sources or modification of existing sources (New Source Review) and for operation of major sources of air pollutants (Title V Air Operating Permit Program).

11.2.1.1 New Source Review

NSR requires that construction of new emission sources or modifications to existing emission sources be evaluated when significant net emission increases result. Two distinct NSR permitting programs apply depending on whether the facility is located in an attainment or nonattainment area for a particular pollutant: nonattainment NSR (NNSR) permitting is required for facilities located in nonattainment areas, while Prevention of Significant Deterioration (PSD) permitting is required for facilities located in attainment areas.

The DWP will be located approximately eighty-two (82) statute miles from the nearest point of the Louisiana coastline. The nearest parish onshore is Cameron Parish, Louisiana. Cameron Parish is designated by the U.S. Environmental Protection Agency (EPA) as "attainment" or "unclassifiable" with National Ambient Air Quality Standards (NAAQS) for all criteria pollutants (Title 40 – *Protection of Environment* of the Code of Federal Regulations [CFR] § 81.319).

Therefore, the Project is not subject to offshore NNSR permitting requirements for any criteria pollutants. Under PSD permitting rules, the major source threshold is 250 tons per year (tpy) unless the facility is listed specifically in 40 CFR § 52.21(b)(1)(i)(a) as having a lower 100 tpy threshold. The Project is not included on the list of operations subject to the more stringent 100 tpy threshold. As such, the Project will be subject to PSD permitting should emissions from the facility exceed the major source threshold of 250 tpy of any regulated pollutant.

Based on the potential operating emissions calculations for stationary sources described in **Appendix G-1** of Volume IIa, the Project will be subject to pre-construction review under the federal PSD regulations since potential emissions of volatile organic compounds (VOCs) will exceed 250 tpy. BMOP has submitted an application encompassing the requirements for a PSD air permit application in Appendix C-4 of Volume I.

The PSD air permit application includes a Best Available Control Technology (BACT) analysis, air quality impacts analysis, and consideration of impacts to Class I areas. As part of the PSD program, the Clean Air Act (CAA) established land classifications for those areas that are in attainment/unclassifiable in order to allow industrial growth while "preventing significant deterioration." The land classifications have defined "PSD increments" – or limited incremental growth over a baseline to maintain good air quality. Areas of high value (e.g., national monuments, national preserves, etc.) were identified as Class I areas, with restricted industrial growth and lower PSD increments to maintain these areas in relatively pristine

conditions (e.g., national wilderness areas, national memorial parks in excess of 5,000 acres, etc.). Class II areas, with slightly higher PSD increments, allow for controlled industrial growth, and Class III areas allow for expanded industrial growth. All areas not designated Class I were initially classified as Class II.

The nearest Class I area to the proposed DWP is the Breton National Wildlife Refuge in Louisiana. The nearest location of the Breton National Wildlife Refuge is greater than 380 km from the DWP. The Project does not have a significant emission increase for any pollutant with a Class I increment. As well, at this great distance, impacts are negligible.

Title V Air Operating Permit Program

Title V air operating permits are required for major stationary sources of air pollutants on the Outer Continental Shelf (OCS), beyond state's seaward boundaries, as defined in 40 CFR Part 71. Based on potential emission calculations provided in **Appendix G-1** of Volume IIa, the DWP platform will be a Title V major source since potential emissions exceed the Title V major source threshold for one or more pollutants. BMOP has submitted an application for a Title V Air Operating Permit in Appendix C-5 of Volume I.

11.2.2 Louisiana Permitting Program

The DWPA identifies that the law of the nearest adjacent coastal state will apply to a DWP, such as the proposed Project (33 USC § 1518(b)). The nearest adjacent coastal state is Louisiana. Louisiana's State Implementation Plan (SIP) provides the requirements for state permitting of construction or modification of emissions sources and operation of emission sources in Louisiana Administrative Code (LAC) 33.III.Chapter 5 – Permit Procedures, regulated by the Louisiana Department of Environmental Quality (LDEQ).

The LDEQ permitting provisions of this Chapter apply to the owner and operator of any source which emits or has the potential to emit any air contaminant.

Such sources include, but are not limited to:

- Any major source as defined LAC 33:III.502.A;
- Any nonmajor (area) source of hazardous air pollutants required to obtain an operating permit pursuant to regulations promulgated under Section 112 of the federal Clean Air Act; and
- Any nonmajor (minor) source that does not meet the exemptions specified in LAC 33:III.501.B and thus required to obtain an air quality permit.

The BMOP offshore Project facility at WC 509 will be subject to federal major source permitting under the PSD pre-construction program, as discussed previously. As such, the offshore portion of the project will be permitted by Region 6 of the EPA., and will be subject to regulations under Louisiana's SIP, as applicable.

11.2.3 Air Quality Regulations

The Project is potentially subject to federal and state regulations for air quality control. This section describes the applicability, criteria, and principal requirements of federal, state, and local regulations that result in permit conditions for the offshore components of the Project.

11.2.3.1 Federal Regulations

This section outlines the federal applicability analysis. Both NSPS and NESHAP are evaluated.

New Source Performance Standards (NSPS)

NSPS require new, modified, or reconstructed sources to control emissions to the level achievable by the best demonstrated technology as specified in the applicable provisions. Moreover, any source subject to an NSPS is also subject to the general provisions of Subpart A, except as noted. Below is a discussion of potentially applicable subparts for the Project.

NSPS Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels

NSPS Subpart Kb, Standards of Performance for Volatile Organic Liquid Storage Vessels, regulates storage vessels with a capacity greater than or equal to 75 cubic meters (m^3) (19,813 gallons) that are used to store volatile organic liquids for which construction, reconstruction, or modification commenced after July 23, 1984.

NSPS Subpart Kb has provisions in §60.110b(b) to exempt tanks based on size and the maximum true vapor pressure (TVP) of the material stored. Specifically, NSPS Subpart Kb "does not apply to storage vessels with a capacity greater than or equal to 151 m^3 (39,890 gallons) storing a liquid with a maximum TVP less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 m^3 (19,813 gallons) but less than 151 m^3 (39,890 gallons) storing a liquid with a maximum TVP less than 15.0 kPa." Vessels permanently attached to mobile vehicles such as trucks, railcars, barges, or ships are not subject to this subpart. In addition, process vessels do not meet the definition of a storage vessel per 40 CFR § 60.111b.

The offshore Project includes the following storage vessels with a capacity greater than 19,813 gallons:

- One (1) 42,000-gallon crude oil surge tank located at the DWP platform.

However, the surge tank is considered a process vessel and is therefore not subject to NSPS Subpart Kb. EPA provided additional guidance that process tanks are exempt from Subpart Kb and that vessels used for the pipeline surge control (not storage) are considered to be process tanks (Federal Register [FR] Volume 68, pages 59329-59330, October 15, 2003). As such, the Project is not subject to the requirements of NSPS Subpart Kb.

NSPS Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

NSPS Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, applies to owners or operators of compression ignition (CI) internal combustion engines (ICE) that commenced construction, reconstruction or modification after July 11, 2005 and were manufactured after April 1, 2006 if not fire pump engines, and after July 1, 2006 if certified fire pump engines.

BMOP proposes the following CI ICE, located on the DWP platform, that are subject to the requirements of NSPS Subpart IIII:

- One (1) 1,500 kW (~2,012 hp) emergency diesel generator (40 CFR § 60.4100(a)(2)(i));
- Two (2) 354 kW (~475 hp) non-emergency diesel crane engines (40 CFR § 60.4100(a)(2)(i)); and

- Two (2) 485 kW (~650 hp) emergency diesel firewater pump engines (40 CFR § 60.4100(a)(2)(ii)).

The one (1) 1,500 kW (~2,012 hp) emergency diesel generator will be subject to 40 CFR § 60.4205(b), which states that owners or operators of 2007 model year and later emergency stationary CI ICE with a displacement of less than 30 liters per cylinder that are not fire pump engines must comply with emission standards for new CI engines in 40 CFR § 60.4202. Per 40 CFR § 60.4202(a)(2), 2007 model year or later emergency CI ICE <3,000 hp and displacement <10 L/cylinder that are not fire pump engines, must meet standards in 40 CFR § 89.112. Table 1 of 40 CFR § 89.112 limits emissions standards to the following for engines >560 kW:

- Non-methane hydrocarbons (NMHC) + NO_X - 6.4 g/kW-hr
- Carbon Monoxide (CO) - 3.5 g/kW-hr
- Particulate matter (PM) - 0.2 g/kW-hr

The two (2) 354 kW (~475 hp) non-emergency diesel crane engines at WC 509 will be subject to 40 CFR § 60.4204(b), which states that owners or operators of 2007 model year or later non-emergency stationary CI ICE with a displacement of less than 30 liters/cylinder must comply with emission standards for new CI engines in 40 CFR § 60.4201. Per 40 CFR § 60.4201(a), 2007 model year or later non-emergency CI ICE <3,000 hp and displacement <10 liters/cylinder must meet standards in 40 CFR § 89.112 or 40 CFR § 1039.101 (as applicable). Per Table 1 of 40 CFR § 1039.101, for model year 2014 or later engines between 130 kW to 560 kW, emission standards are as follows. Per 40 CFR § 1039.101(e), exhaust emissions from the engines may not exceed the applicable not-to-exceed (NTE) standards, which for the applicable pollutants (NO_X, NMHC, and PM) is 1.5 times the standard. The following emissions standards have included the appropriate NTE multiplier for the engines.

- PM - 0.03 g/kW-hr
- Oxides of Nitrogen (NO_X) - 0.6 g/kW-hr
- NMHC (VOC) - 0.29 g/kW-hr
- CO - 3.5 g/kW-hr

The two (2) 485 kW (~650 hp) emergency diesel firewater pump will be subject to 40 CFR § 60.4205(c), which states that owners or operators of fire pump engines with a displacement of <30 liters/cylinder must comply with emission standards in Table 4 of NSPS Subpart IIII. Per Table 4, model year 2009 or later engines with a maximum engine power greater than or equal to 450 kW and less than or equal to 560 kW must meet the following emission standards:

- NMHC + NO_X - 4.0 g/kW-hr (3.0 g/bhp-hr)
- CO - 3.5 g/kW-hr (2.60 g/bhp-hr)
- PM - 0.2 g/kW-hr (0.15 g/bhp-hr)

Per 40 CFR §§ 60.4209(a) and 60.4214(b), owners of emergency stationary CI ICE that do not meet the standards applicable to non-emergency engines must install a non-resettable hour meter prior to startup of the engine and keep records of the operation of the engine in emergency and non-emergency service. For all the CI ICEs, the owner must purchase an engine certified to the emission standards and install and configure the engine according to manufacturer's specifications, per 40 CFR § 60.4211(c).

NSPS Subpart JJJJ – Standards of Performance for Stationary Spark Ignition Internal Combustion Engines

NSPS Subpart JJJJ, Standards of Performance for Stationary Spark Ignition Internal Combustion Engines, applies to owners or operators of spark ignition ICE that commenced construction or were modified or reconstructed after June 12, 2006.

The two (2) proposed 1,736 kW (~2,328 hp) natural gas fired generators at the proposed DWP are considered spark ignition ICE and are subject to NSPS Subpart JJJJ per 40 CFR § 60.4230(a)(4)(i). Per 40 CFR § 60.4233(e), engines greater than 100 hp must comply with the emission standards in Table 1 of Subpart JJJJ emission standards.

Non-emergency lean burn engines greater than 1,350 hp manufactured after July 1, 2010 must meet the following emission standards, according to Table 1 of NSPS Subpart JJJJ:

- NO_X - 1.0 g/hp-hr or 1.36 g/kW-hr (82 ppmvd at 15% O_2)
- CO - 2.0 g/hp-hr or 2.72 g/kW-hr (270 ppmvd at 15% O_2)
- VOC - 0.7 g/hp-hr or 0.95 g/kW-hr (60 ppmvd at 15% O_2)

Per 40 CFR § 60.4243(b), the owner must either purchase a certified engine or if purchasing a non-certified engine complete performance testing per 40 CFR § 60.4244 to demonstrate compliance with emission limits. Initial performance testing is required within 180 days of startup (per Subpart A) and subsequent testing every 8,760 hours or 3 years, whichever comes first. Per 40 CFR § 60.7(a)(3), initial notification is due within 15 days of startup.

NSPS Subpart OOOO – Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution

NSPS Subpart OOOO, Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution establishes emission standards and compliance schedules for the control of VOC and sulfur dioxide (SO_2) emissions from affected facilities that commence construction, modification or reconstruction after August 23, 2011. Only onshore affected facilities are subject, which exclude all facilities located in the territorial seas or on the OCS (definition of "onshore" at 40 CFR § 60.5430). Therefore, NSPS Subpart OOOO does not apply to the Project.

NSPS Subpart OOOOa – Standards of Performance for Crude Oil and Natural Gas Facilities

NSPS Subpart OOOOa, Standards of Performance for Crude Oil and Natural Gas Facilities, establishes emission standards and compliance schedules for the control of greenhouse gas (GHG), VOC and SO_2 emissions from affected facilities that commence construction, modification or reconstruction after September 18, 2015. Similar to Subpart OOOO, above, affected facilities include only onshore operations. Therefore, NSPS Subpart OOOOa does not apply to the Project.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

NESHAP are emission standards for HAP and are applicable to major and area sources of HAP. A HAP major source is defined as having potential total HAP emissions in excess of 25 tpy and/or potential individual HAP emissions in excess of 10 tpy. An area source is a stationary source that is not a major source. Part 61 NESHAPs are chemical-based NESHAPs, while Part 63 NESHAP allowable emission limits are established on the basis of a Maximum Achievable Control Technology (MACT) determination for a particular source category. NESHAP apply to sources in specifically regulated industrial source

categories (CAA Section 112(d)) or on a case-by-case basis (Section 112(g)) for facilities not regulated as a specific industrial source type). The Project is a major source of HAP, as potential individual and total HAP emissions are greater than 10 and 25 tpy, respectively.

Similar to NSPS, any source subject to a NESHAP is also subject to the general provision of the respective NESHAP Subpart A, unless specifically excluded.

40 CFR Part 61 Subpart V - Equipment Leaks (Fugitive Emission Sources)

40 CFR Part 61 Subpart V, NESHAP for Equipment Leaks (Fugitive Emission Sources), applies to the following sources that are intended to operate in volatile hazardous air pollutant (VHAP) service: pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, and control devices or systems required by the subpart.

A VHAP and in VHAP service are respectively defined in 40 CFR § 61.241 as follows:

> *"VHAP means a substance regulated under this part for which a standard for equipment leaks of the substance has been proposed and promulgated. Benzene is a VHAP. Vinyl chloride is a VHAP."*

> *"In VHAP service means that a piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 10 percent by weight a volatile hazardous air pollutant (VHAP) as determined according to the provisions of §61.245(d). The provisions of §61.245(d) also specify how to determine that a piece of equipment is not in VHAP service."*

The crude oil to be handled and loaded at the DWP will contain benzene at less than 10 percent by weight. As such, the pipeline components regulated by this subpart will not operate "in VHAP Service," as defined in 40 CFR § 61.241. Therefore, Subpart V does not apply to the Project.

40 CFR Part 63 Subpart B – Control Technology Determinations for Major Sources in Accordance with Clean Air Act Sections 112(g) and 112(j)

The proposed marine loading activity at the DWP is not regulated under another subpart of Part 63, as discussed below. Per 40 CFR § 63.40(b), the use of CALM Buoys in exposed waters to load crude oil into VLCCs (and other crude oil carriers) for export to the global market is subject to Subpart B of Part 63.

> *"The requirements of §§ 63.40 through 63.44 of this subpart apply to any owner or operator who constructs or reconstructs a major source of hazardous air pollutants after the effective date of section 112(g)(2)(B) (as defined in § 63.41) and the effective date of a title V permit program in the State or local jurisdiction in which the major source is (or would be) located unless the major source in question has been specifically regulated or exempted from regulation under a standard issued pursuant to section 112(d), section 112(h), or section 112(j) and incorporated in another subpart of part 63, or the owner or operator of such major source has received all necessary air quality permits for such construction or reconstruction project before the effective date of section 112(g)(2)(B)."*

BMOP is proposing to "construct a major source" per 40 CFR § 63.41. Accordingly, a case-by-case MACT application has been prepared and included in Appendix C-6 of Volume I.

40 CFR Part 63 Subpart H – Equipment Leaks

40 CFR Part 63 Subpart H, NESHAP for Equipment Leaks, applies to pumps, compressors, agitators, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge

control vessels, bottoms receivers, instrumentation systems, and control devices or closed vent systems required by this subpart that are intended to operate in organic hazardous air pollutant service 300 hours or more during the calendar year within a source subject to the provisions of a specific subpart in 40 CFR Part 63 that references this subpart. No Part 63 subpart that applies to the Project references this Subpart H. Furthermore, "in organic HAP service" is defined in 40 CFR § 63.161 as:

> *".. a piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 5 percent by weight of total organic HAP's as determined according to the provisions of §63.180(d) of this subpart. The provisions of §63.180(d) of this subpart also specify how to determine that a piece of equipment is not in organic HAP service."*

The facility will not operate pipeline components that are in organic HAP service; therefore, BMOP has determined that 40 CFR Part 63 Subpart H is not applicable to the Project.

40 CFR Part 63 Subpart Y – Marine Tank Loading Operations

40 CFR Part 63 Subpart Y, NESHAP for Marine Tank Loading Operations, applies to marine tank loading operations located at major or area sources of HAP emissions. BMOP has determined that NESHAP Subpart Y is not applicable to the Project.

A detailed NESHAP 40 CFR Part 63 Subpart Y non-applicability discussion is provided in the case-by-case MACT application provided in Appendix C-6 of Volume I.

40 CFR Part 63 Subpart HH – Oil and Natural Gas Production Facilities

40 CFR Part 63 Subpart HH, NESHAP from Oil and Natural Gas Production Facilities, applies to owners and operators of affected sources at oil and natural gas production facilities at major or area sources of HAP emissions. The Project is not considered an oil and natural gas production facility per 40 CFR § 63.760(a)(3), as it does not process, upgrade, or store natural gas prior to the point at which natural gas enters the natural gas transmission and storage source category or is delivered to a final end user. Further, the Project does not contain any affected sources, as detailed below. Therefore, the Project is not subject to Subpart HH.

40 CFR Part 63 Subpart VV – Oil-Water Separators and Organic-Water Separators

40 CFR Part 63 Subpart VV, NESHAP for Oil-Water Separators and Organic-Water Separators, applies to the control of air emissions from oil-water separators and organic-water separators for which another subpart of 40 CFR Parts 60, 61, or 63 references the use of this subpart for such air emission control. No Part 63 subpart that applies to the Project references Subpart VV. Therefore, BMOP has determined that NESHAP Subpart VV is not applicable to the Project.

40 CFR Part 63 Subpart HHH – Natural Gas Transmission and Storage Facilities

Per 40 CFR §§ 63.1270(a) and (b), Subpart HHH applies to glycol dehydration units at major sources of HAP. The Project does not involve any glycol dehydration units; therefore, Subpart HHH is not applicable.

40 CFR Part 63 Subpart EEEE – Organic Liquids Distribution (Non-Gasoline)

40 CFR Part 63 Subpart EEEE, NESHAP for Organic Liquids Distribution (Non-Gasoline), applies to organic liquids distribution (OLD) operations at or part of a major source of HAP emissions. Subpart EEEE includes standards for the following sources (40 CFR § 63.2338):

- Storage tanks storing organic liquids;
- Transfer racks at which organic liquids are loaded into or unloaded out of transport vehicles and/or containers; and
- All equipment leak components in organic liquid service that are associated with:
    - Storage tanks;
    - Transfer racks;
    - Pipelines between storage tanks and transfer racks; and
    - Transport vehicles and containers.

The proposed 1,000-barrel surge vessel is not a storage tank, as explicitly excluded in the definition of "storage tank" at 40 CFR § 63.2406. The other storage tanks proposed do not store an organic liquid (excludes diesel, and fuels used for refueling). As well, the project will not include a transfer rack, as the delivery of crude is to marine vessel, not to a cargo tank or tank car.

As such, the Project is not subject to requirements under Subpart EEEE.

40 CFR Part 63 Subpart ZZZZ – Stationary Reciprocating Internal Combustion Engines

40 CFR Part 63 Subpart ZZZZ, NESHAP for Stationary Reciprocating Internal Combustion Engines, applies to reciprocating internal combustion engines (RICE) located at major or area sources of HAP emissions. A stationary RICE is any internal combustion engine that uses reciprocating motion to convert heat energy into mechanical work and which is not mobile. For engines located at a major source of HAP emissions, a stationary RICE is 'new' if the unit commenced construction or reconstruction on or after December 19, 2002 and if the engine has a site rating of more than 500 hp or on or after June 12, 2006 and if the engine has a site rating of less than or equal to 500 hp (40 CFR §§ 63.6590(a)(2)(i) and (ii)). All the proposed engines associated with the WC 509 Platform Complex are considered 'new'.

Per 40 CFR § 63.6590(c)(7), new CI stationary RICE with a site rating of less than or equal to 500 brake hp located at a major source of HAP emissions must meet the requirements of Subpart ZZZZ by demonstrating compliance with NSPS Subpart JJJJ or IIII, respectively. This applies to the following RICE associated with the DWP project:

- Two (2) 354 kW (~475 hp) non-emergency diesel crane engines.

These engines have no further requirements under Subpart ZZZZ.

The two (2) proposed 1,736 kW (~2,328 hp) natural gas fired generators are four-stroke, lean burn spark engine ICE and must comply with the emissions limitations in Table 2a and the operating limitations in Table 2b, per 40 CFR § 63.6600(b), as provided below:

- Four-stroke lean burn engines must reduce CO emissions by 93 percent or more or limit the concentration of formaldehyde in the stationary RICE exhaust to 14 ppmvd or less at 15 percent O_2 [Table 2a];
- Maintain catalyst so that the pressure drop across the catalyst does not change by more than 2 inches of water at 100 percent load plus or minus 10 percent from the pressure drop across the catalyst that was measured during the initial performance test [Table 2b]; and
    - During the initial performance test, establish each operating limitation described above [§63.6630(b)].

  - Submit a notification of compliance status containing the results of the initial compliance demonstration according to the requirements of §63.6645 [§63.6630(c)].
  - Conduct semi-annual performance tests for CO to demonstrate that the required CO percent reduction is achieved [§63.6640(a) and Table 6].

- Maintain the temperature of your stationary RICE exhaust so that the catalyst inlet temperature is greater than or equal to 450°F and less than or equal to 1350°F [Table 2b].
  - Install, operate, and maintain a temperature continuous parameter monitoring system (CPMS) that meets the requirements of §63.6625(b) [§63.6625(b)].
  - Continuously collect and reduce data to 4-hour averages [§63.6635, §63.6640(a) and Table 6].

The one (1) 1,500 kW (~2,012 hp) emergency diesel generator and two (2) 485 kW (~650 hp) emergency diesel firewater pump engines do not need to comply with the emissions limitations or operating limitations of Tables 1a, 2a, 2c, and 2d, per 40 CFR § 63.6600(c); however, the engines must comply with the following:

- Maintenance checks and readiness testing is limited to 100 hours per year (40 CFR § 63.6640(f)(2));
- The engine may only be operated for 50 hours per year outside of emergency operation and maintenance and testing; however, these 50 hours are counted towards the 100 hours provided for maintenance and testing (40 CFR § 63.6640(f)(3));
- Submit all applicable notifications described in 40 CFR § 63.6645 by the appropriate dates specified (40 CFR § 63.6645);
- Submit semiannual compliance reports that meet the requirements of 40 CFR § 63.6650, if applicable (40 CFR §§ 63.6640 and 63.6650);
- Maintain all applicable records described in §63.6655, including, but not limited to, all notifications, performance tests, and maintenance conducted on the engine (40 CFR §§ 63.6655(a), (b), (d), and (e));
- Per 40 CFR § 63.6605(b), at all times you must operate and maintain the engine, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions; and
- Per 40 CFR § 63.6625(h), any new stationary engine must minimize engine idle time at startup and limit startup period to less than 30 minutes.

Risk Management Program

40 CFR Part 68, Chemical Accident Provisions, requires submittal of a Risk Management Plan if the facility stores a regulated material above the applicable concentration and threshold values. Since the BMOP project will not store a regulated material above the applicable threshold limits, the Project is only subject to the General Duty Clause requirements and must review materials as purchased to verify if additional requirements must be met.

Greenhouse Gas Mandatory Reporting Rule

Under the Consolidated Appropriations Act of 2008 (P.L. 110–161), the EPA authorized funding to develop a rule requiring mandatory reporting of GHG emissions above appropriate thresholds. the EPA has authority under sections 114 and 208 of the Clean Air Act (42 USC § 7414 and 7542) to collect information about sources of air pollution and has issued implementing regulations at 40 CFR Part 98.

The EPA has promulgated monitoring, reporting, and recordkeeping rules for GHGs. A facility is required to report its GHG emissions if its aggregate maximum rated heat input from all combustion sources is greater than 30 million British thermal units per hour (MMBtu/hr) and it emits more than 25,000 metric tpy of carbon dioxide equivalent (CO2e) (40 CFR § 98.2(a)). The Project will include stationary combustion sources located on the WC 509 Platform Complex, but the aggregate total of all combustion sources that could be used at one time is less than 30 MMBtu/hr. There are no other proposed sources that are included as categories under Part 98. Accordingly, the Project will not be subject to the requirements of the GHG Mandatory Reporting Rule.

General Conformity

General conformity regulations in 40 CFR Part 93, Subpart B, are designed to ensure that federal actions that occur in nonattainment and maintenance areas conform to the appropriate State Implementation Plan, and do not interfere with a state's ability to attain or maintain compliance with NAAQS. The Project is considered a federal action, as a federal agency (i.e. MARAD) will be licensing, permitting, or otherwise approving portions of the Project.

Emissions at a facility, such as mobile sources, not regulated by the facility's air permit must be included in the General Conformity applicability analysis. A conformity determination is required for each pollutant for which the total of direct and indirect emissions caused by a federal action in a nonattainment area would equal or exceed de-minimis levels as specified in 40 CFR § 93.153.

As discussed above, none of the Project activities will occur in federally designated nonattainment or maintenance areas. Consequently, neither a general conformity applicability analysis nor a conformity determination is required.

11.2.3.2 State Regulations

For DPLAs, the EPA administers CAA requirements and reviews air permit applications, using adjacent state's regulation. While the onshore portion of the Project will be located in both Louisiana and Texas, the nearest adjacent state to the DWP project's offshore location is Louisiana. Therefore, the LDEQ rules and regulations will apply to the offshore portion of the Project. Below is a discussion of potentially applicable LAC 33:III chapters for the Project.

Louisiana Air Quality Regulations

LAC 33:III Chapter 11 - Control of Emissions of Smoke

This regulation prohibits impairment of visibility due to emissions of smoke and provides an opacity limit of 20 percent from combustion smoke except during periods of maintenance. Also provided are restrictions for outdoor burning. The opacity standards set forth in LAC 33:III.1101 do not apply to combustion units when combusting only natural gas and combustion units subject to a federal standard promulgated pursuant to section 111 or 112 of the Clean Air Act that limits average opacity to less than or equal to 20 percent, except for one six-minute period or less per hour.

The diesel combustion sources located at the DWP platform will be subject to this Chapter. However all the combustion sources combusting only natural gas will be exempt from this rule as they meet the criteria of LAC 33:III.1107.B.1.

LAC 33:III Chapter 13 – Emission Standards for Particulate Matter

This regulation prohibits impairment of visibility due to emissions of PM. According to LAC 33:III.1311.C, this regulation provides an opacity limit of 20 percent from emissions of PM. This regulation applies to all combustion sources of the offshore project.

LAC 33:III Chapter 15 – Emission Standards for Sulfur Dioxide

This regulation applies to new or existing sulfuric acid production units, sulfur recovery plants, and all other single point sources that emit or have the potential to emit 5 tpy or more of SO_2 into the atmosphere. Since no single point source for the Project emits or has the potential to emit 5 tpy or more of SO_2, this regulation does not apply.

LAC 33:III Chapter 21, Section 2103 – Storage of Volatile Organic Compounds

This regulation applies to storage tanks greater than 40,000 gallons which store VOC products with a maximum TVP of 1.5 pounds per square inch absolute (psia) or greater at storage conditions. The diesel storage tanks proposed as part of the Project are not subject to this regulation since the vapor pressure of diesel is less than 1.5 psia. The 42,000-gallon crude oil surge vessel located at the WC 509B platform is exempt from this regulation as per LAC 33:III 2103.G.1 since the tank has a nominal storage capacity of less than 420,000 gallons and is NOT subject to New Source Performance Standards.

LAC 33:III Chapter 21, Section 2108 – Marine Vapor Recovery

This regulation applies to any marine loading operation serving ships and/or barges loading crude oil, gasoline, or VOCs with uncontrolled emission of 25 tpy or more of VOC in the parishes of Ascension, East Baton Rouge, Iberville, Livingston, and West Baton Rouge, or 100 tpy or greater of VOC in any other parish of the State of Louisiana.

Since this is an offshore project and is not located onshore in any of the Louisiana parishes, BMOP has determined that this regulation is not applicable to the Project.

LAC 33:III Chapter 21, Section 2111 – Pumps and Compressors

Rotary pumps and compressors that handle VOCs having a TVP greater than or equal to 1.5 psia at handling conditions must be equipped with mechanical seals or other equivalent equipment or means as approved by the administrative authority. The WC 509 Platform Complex does not include crude oil pumps, nor natural gas compressors. The diesel equipment does not handle VOCs having a TVP greater than or equal to 1.5 psia. Only the condensate system for the existing natural gas lines, the surge vessel, and the sump system will have pumps and may be subject to this requirement.

LAC 33:III Chapter 21, Section 2113 – Housekeeping

This regulation defines the practices required to maintain the "best practical housekeeping and maintenance" for area VOC control. These practices include activities such as cleaning up spills, keeping containers closed, and properly storing waste. The Project is subject to this regulation.

LAC 33:III Chapter 21, Section 2121 – Fugitive Emission Control

This Section is applicable to each process unit at petroleum refineries, natural gas processing plants, synthetic organic chemical manufacturing industry facilities, methyl tertiary butyl ether manufacturing

facilities, and polymer manufacturing facilities. The Project is not one of the listed facility types and is not subject to this regulation.

LAC 33:III Chapter 51 - Comprehensive Toxic Air Pollutant Emission Control Program

The provisions of the Comprehensive Toxic Air Pollutant (TAP) Program (LAC 33:III.Chapter 51) apply to the owners and operators of any major source that emits, or has the potential to emit 10 tpy or more of any individual TAP, or 25 tpy or more of any combination of TAPs, listed in Table 51.1 of LAC 33:III.5112. The Project will be subject to this chapter. An evaluation of the TAP program is included in the PSD application submitted in Appendix C-4 of Volume I.

LAC 33:III Chapter 56 - Prevention of Air Pollution Emergency Episodes

This regulation is designed to prevent the buildup of excess concentrations of air contaminants during periods of high air pollution potential. The Project is subject to this regulation.

LAC 33:III Chapter 59 - Chemical Accident Prevention and Minimization of Consequences

This regulation does not apply to the Project since it does not produce, process, handle, or store any substance listed in LAC 33:III.5907 greater than the threshold amounts.

11.3 EXISTING ENVIRONMENT

11.3.1 General Climatology and Meteorology

Louisiana has a mainly humid subtropical climate. The state has vast areas of coastal marshes and swamps, wet savannas, and elevated regions of longleaf pine forests and bald cypress. The Mississippi River forms a large part of the eastern boundary. The geography has two divisions, the uplands in the north, and alluvial swamplands, marshlands, beaches, barrier islands on the coast. The Gulf of Mexico, Red and Ouachita rivers and other minor streams called bayous constitute the main water bodies. The low latitudes and proximity to the Gulf chiefly influence the climate. Summers are hot and humid in Louisiana, with frequent afternoon thunderstorms that bring intense tropical downpours. The June to September period consistently has high temperatures of approximately 90 degrees Fahrenheit or higher, while nights remain mild. Winters are mild in southern Louisiana and only occasionally register temperatures below freezing. Spring and autumn are milder than the summer. The average annual rainfall in southern Louisiana is 75" (1905 mm). Rainfall occurs throughout the year, with a predominant wet season from April to September. Snowfall and sleet are rare near the Gulf of Mexico (NOAA, 2020a; NOAA 2020b).

The climatological conditions in the surrounding area of the offshore project were assessed based on the local climatological data obtained from NCDC (https://gis.ncdc.noaa.gov/maps/ncei/lcd). Based on data completeness, availability, and proximity, Vermilion 331 Oil Platform (WBAN: 00322) station's data is utilized to assess the climatological conditions for the DWP, which is approximately 40 nautical miles from the Project location. Due to the proximity to the Project and the even nature of the regional climate of the Gulf of Mexico, Vermilion 331 Oil Platform (WBAN: 00322) station's data is representative of the climate near the offshore project.

The annual average air temperature (dry bulb temperature) is 75.1° F (2014 - 2019). The monthly average air temperature ranges from 61.9°F in January to 85.5°F in August. The temperature data surrounding the Project area is shown in **Figure 11-3**. Based on data collected at the Vermillion 331 Oil Platform, the annual average relative humidity is 74.8% (2014 - 2019) and visibility i.e., the horizontal distance an object can be seen and identified is 8.5 miles.

The windspeed ranges from 6.2 miles per hour (mph) to 15.3 mph, with an annual average windspeed of 12.0 mph (2014 - 2019). As shown in **Figure 11-4**, the prevailing wind directions are south/southeast and southeast.

FIGURE 11-3 Vermilion 331 Oil Platform (WBAN: 00322) Station Temperature Data (2014 – 2019)

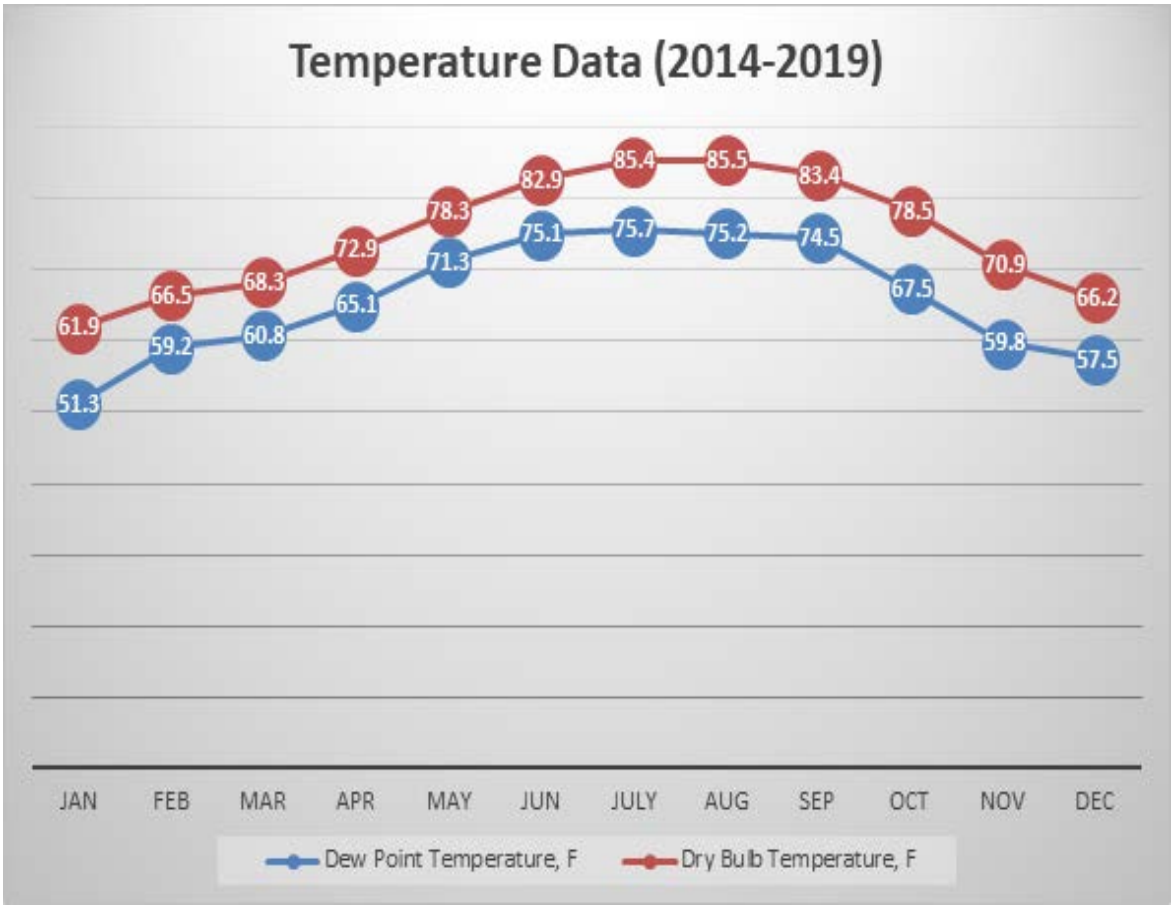
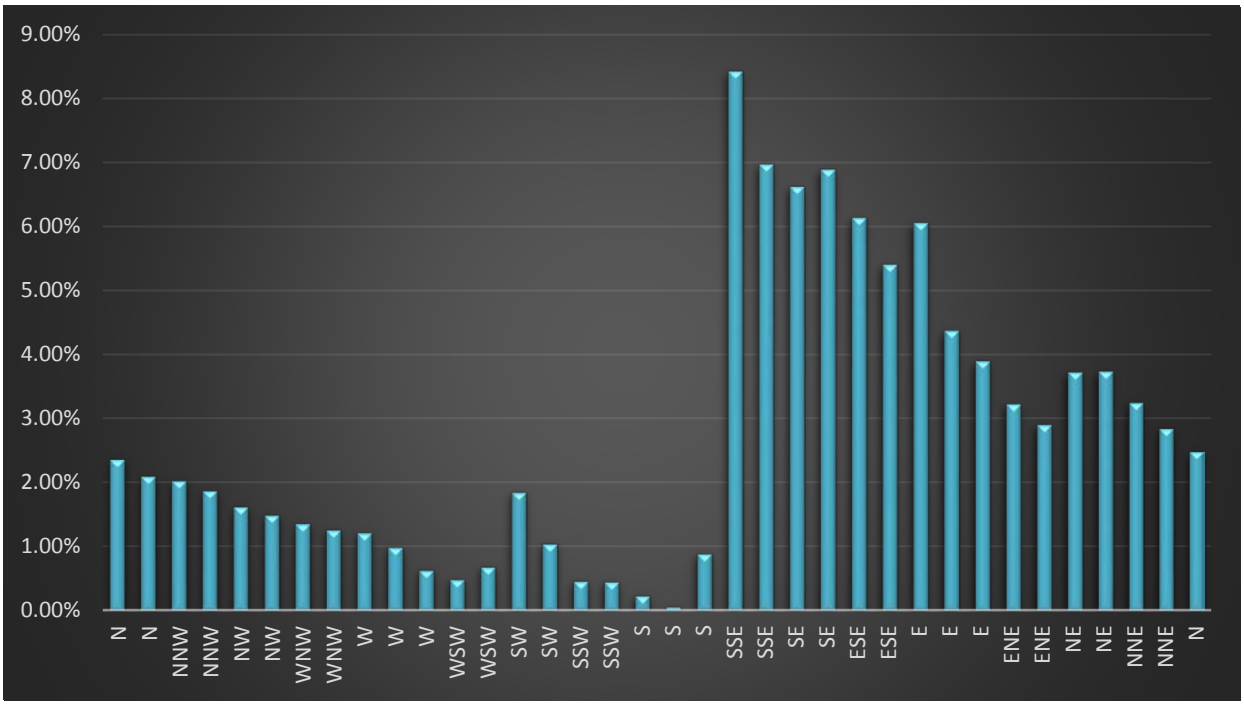


FIGURE 11-4 Vermilion 331 Oil Platform (WBAN: 00322) Station Prevailing Wind Direction (2014 – 2019)



11.3.2 Air Quality

The state of Louisiana does not have state-specific ambient air standards. As such, the air quality review is based on the National standards.

The EPA has promulgated NAAQS to protect human health and welfare. The NAAQS include primary standards, which are designed to protect human health, including the health of sensitive subpopulations such as children and those with chronic respiratory problems, and secondary standards, which are designed to protect public welfare, including economic interests, visibility, vegetation, animal species, and other concerns. The NAAQS currently apply to the following criteria pollutants:

- PM with a nominal aerodynamic diameter of 10 microns or less (PM_{10});
- PM with a nominal aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$);
- nitrogen dioxide (NO_2);
- SO_2;
- CO;
- ozone (O_3); and
- lead (Pb).

Each NAAQS is expressed in terms of a concentration level and an associated averaging period. The current NAAQS for these criteria pollutants are summarized in **Table 11-1**.

TABLE 11-1
National Ambient Air Quality Standards

Pollutant	Primary/Secondary	Averaging Period	Level	Form
CO	Primary	8-hour	9 ppm	Not to be exceeded more than once per year
		1-hr	35 ppm	
Pb	Primary and Secondary	Rolling 3-month average	0.15 µg/m^3 [(a)]	Not to be exceeded
NO_2	Primary	1-hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Primary and Secondary	Annual	53 ppb[(b)]	Annual mean
O_3	Primary and Secondary	8-hour	0.070 ppm[(c)]	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
$PM_{2.5}$	Primary	Annual	12.0 µg/m^3	Annual mean, averaged over 3 years
	Secondary	Annual	15.0 µg/m^3	Annual mean, averaged over 3 years
	Primary and Secondary	24-hour	35 µg/m^3	98th percentile, averaged over 3 years

TABLE 11-1
National Ambient Air Quality Standards

Pollutant	Primary/Secondary	Averaging Period	Level	Form
PM_{10}	Primary and Secondary	24-hour	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
SO_2	Primary	1-hour	75 ppb[(d)]	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
	Secondary	3-hour	0.5 ppm	Not to be exceeded more than once per year

Units:
ppm = parts per million by volume
ppb = parts per billion by volume
µg/m^3 = micrograms per cubic meter

Notes:
[a] In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m^3) as a calendar quarter average also remain in effect.
[b] The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
[c] Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards additionally remain in effect in some areas. Revocation of the previous (2008) O_3 standards and transitioning to the current (2015) standards will be addressed in the implementation rule for the current standards.
[d] The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2) any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a State Implementation Plan call under the previous SO_2 standards (40 CFR § 50.4(3)). A SIP call is an EPA action requiring a state to resubmit all or part of its State Implementation Plan to demonstrate attainment of the required NAAQS.

Due to the absence of offshore ambient concentration monitors, BMOP utilized the onshore monitors to assess the existing ambient air quality surrounding the offshore project. The selected monitors were chosen based on their proximity to the offshore project and their representativeness of pollutants in the Project area. The EPA Monitor Values Reports were obtained for all criteria pollutants and their respective averaging periods to assess the existing ambient air quality for the DWP. BMOP utilized a design concentration averaged over the latest three years (2017 - 2019) period. **Table 11-2** shows all criteria pollutants in the vicinity of the Project area are below their applicable NAAQS.

TABLE 11-2
Existing Ambient Air Quality Estimated for the Offshore Project

Pollutant	Averaging Period	Rank	Monitor	2017	2018	2019	Ambient Concentration for Comparison to NAAQS	NAAQS	Units
CO	8-hour	2nd High	A	1	1.7	0.9	1.7 *Highest 2nd High (2018)*	9	ppm
	1-hour	2nd High	A	3.2	2.2	1.4	3.2 *Highest 2nd High (2017)*	35	ppm
Pb	Rolling 3-month average	1st High	A, F	0	0	0.09	0.09 *Maximum rolling 3-month lead average over a 3-year period*	0.15	µg/m^3
NO_2	1-hour	98th Percentile	B	20	18	23	20 *3-year Average of 98th Percentile*	100	ppb
	Annual	Mean	B	4.49	3.78	2.75	4.49 *Highest Annual Mean (2017)*	53	ppb
$PM_{2.5}$	Annual	Mean	C	7.8	7.9	6.8	7.5 *3-year Average of Annual Mean*	12.0	µg/m^3
	24-Hour	98th Percentile	C	21	25	14	20 *3-year Average of 98th Percentile*	35	µg/m^3
PM_{10}	24-Hour	2nd High	D	69[a]	108[b]	52[c]	108 *Highest 2nd High (2018)*	150	µg/m^3
SO_2	1-hour	99th Percentile	E	21	31	26	26 *3-year Average of 99th Percentile*	75	ppb
	3-Hour	2nd High	E	0.03[d]	0.04[d]	0.03[d]	0.04 *Highest 2nd High (2018)*	0.5	ppm
	24-Hour	2nd High	E	0.005	0.008	0.007	0.008 *Highest 2nd High (2018)*	0.14	ppm
	Annual	Mean	E	0.001	0.0005	0.001	0.001 *Highest Annual Mean (2017, 2019)*	0.03	ppm

Notes:
[a] 365 valid days of data of the 365 required days.
[b] 348 valid days of data of the 365 required days.
[c] 331 valid days of data of the 365 required days.
[d] Because 3-hour data is not available, the 2nd highest maximum 1-hour value is utilized.

Monitor Station Key:
A: 22-033-0009: 1061-A Leesville Ave, Baton Rouge, LA, ~285 km from DWP.
B. 22-047-0009: 65180 Belleview Road, Iberville, LA, ~ 256 km from DWP.

TABLE 11-2
Existing Ambient Air Quality Estimated for the Offshore Project

Pollutant	Averaging Period	Rank	Monitor	2017	2018	2019	Ambient Concentration for Comparison to NAAQS	NAAQS	Units
C: 22-019-0009: 2284 Paul Bellow Road, Vinton, LA, ~207 km from DWP. D: 22-055-0007: 700 Cajundome, Lafayette, LA, ~219 km from DWP. E: 22-019-0011: 8220 Big Lake Rd, Lake Charles, LA, ~186 km from DWP. F: 22-095-0003: 115 Garden Grove, LaPlace LA, ~ 303 km from DWP.									

BMOP utilized a representative offshore ozone value as no ambient ozone monitors exist in the Gulf of Mexico for design value NAAQS purposes. Based on the following references, BMOP determined 40 ppb is a representative yet conservative offshore ozone value to represent the existing ambient air quality for the offshore portion of the Project:

- Remote marine typical summertime daily maximum ozone concentrations range from 20-40 ppb (National Research Council, 1991).
- Ozone measurements taken at a Texas Commission on Environmental Quality (TCEQ) monitoring station in Galveston, Texas, show that levels below 20 ppb are common when air masses originate from the Gulf of Mexico (Tuite et al., 2018).
- During the Gulf of Mexico and East Coast Carbon Cruise (GOMECC) study aboard the National Oceanic and Atmospheric Administration (NOAA) research vessel Ronald Brown, ozone remained in the 20–30 ppb range in the Gulf of Mexico when southerly winds were encountered (Helmig et al., 2012).
- Gulf of Mexico background ozone is ~39 ppb based on data from 21 Tunable Optical Profiler for Aerosol and oZone lidar (TOPAZ) flights according to the TCEQ (Estes, 2010).
- Back-trajectories originating in central Houston, Texas were run for all days with available data from May through October 2000-2007 using the NOAA Air Resource Laboratory (ARL) Hybrid Single-Particle Lagrangian Integrated Trajectory (HYSPLIT) model. Next, a clustering algorithm built into HYPSLIT was used to sequester individual back-trajectories into a relatively small set of classes based on shape and direction (i.e., clusters). The mean background Houston-Galveston-Brazoria (HGB) ozone was 21 and 25 ppb for the two trajectory clusters originating over the Gulf of Mexico (Estes, 2009) (Sullivan, 2009).
- Back-trajectories originating in Galveston, Texas were run for all days with available data from May through September 2007-2011 using the NOAA ARL HYSPLIT model. The SAS FASTCLUS procedure was used to define clusters of back trajectories. Clusters 1 and 5 from the Gulf of Mexico were associated with 20-30 ppb ozone (Estes et al, 2014).

An air quality control region, as defined in Section 107 of the CAA, is a federally-designated area in which NAAQS must be met. An implementation plan is developed for each air quality control region describing how ambient air quality standards will be achieved and maintained.

EPA designates the attainment status of an area on a pollutant-specific basis based on whether an area meets the NAAQS. Areas that meet the NAAQS are termed “attainment areas.” Areas that do not meet the NAAQS are termed “nonattainment areas.” Areas for which insufficient data are available to determine attainment status are termed “unclassifiable areas.” Areas formerly designated as nonattainment areas that subsequently reached attainment status are termed “maintenance areas.”

The attainment status designations are codified in 40 CFR Part 81. The attainment status of the area in which a source is located, and the source's potential air emissions or air emissions increases, determine the permitting process for that source. As discussed above, the DWP will be located 82 statute miles off of the Louisiana coastline. Attainment/non-attainment information is not determined for locations this far offshore. Accordingly, BMOP has referenced the attainment status of the nearest parish onshore, which is Cameron Parish, Louisiana. Cameron Parish is designated by the EPA as "attainment" or "unclassifiable" with NAAQS for all criteria pollutants (40 CFR § 81.319).

11.3.3 Noise

There are no Federal regulatory limits for noise; however, the National Marine Fisheries Service has provided minimum sound energy thresholds that could result in injury or disturbance harassment of exposed marine mammals. In addition, the NOAA Greater Atlantic Regional Fisheries Office (GARFO) has implemented interim acoustic thresholds. The guidance and thresholds, along with GARFO's pile driving acoustics tool were used to evaluate potential effects of underwater noise on the marine environment. The results of this evaluation are presented in Topic Report 6, "Wildlife and Protected Species," in Volume IIa – Offshore Project Components (Public).

11.4 ENVIRONMENTAL CONSEQUENCES

This section includes a discussion of the potential impacts that could result from the construction and operation of the offshore components of the Project. The study area within which potential impacts were assessed includes the area that would be affected physically by Project activities during construction and operation. As described above, the Project's potential effects on meteorology, air quality, and noise have been evaluated based on their potential to:

Air Quality

- Cause or contribute to a violation of NAAQS;
- Cause or contribute to a violation of a Class I or Class II increment (the maximum allowable increase in concentration that is allowed to occur above a baseline concentration for a pollutant);
- Cause an adverse impact on air quality-related values in a Class I area;
- Expose sensitive receptors to substantially increased pollutant concentrations;
- Increase emissions of criteria pollutants beyond limits allowed under Clean Air Act regulations;
- Substantially increase the emissions of greenhouse gases; and/or
- Create objectionable odors, resulting in adverse effects to a substantial number of people.

Noise Quality

- Cause a substantial change in existing ambient noise levels on land (which would affect humans and wildlife) or underwater (which would affect marine wildlife);
- Exceed EPA recommended thresholds for noise levels at noise sensitive receptors; and/or
- Violate state or local noise ordinances, limits, or standards, or applicable land use compatibility guidelines.

Activities associated with the construction, operation, and decommissioning of the DWP and associated pipeline could have environmental consequences on meteorology, air quality, and noise are included in **Table 11-3**. The following table provides further information and discussion of potential environmental consequences.

TABLE 11-3
Potential Impacts on Meteorology, Air Quality, and Noise

Activity	Details	Duration of Impact	Mitigation Measures	Anticipated Level of Impact
Construction				
Pipeline Construction	• Conversion activities will have negligible air emissions. • Emissions and noise created during construction	Short-term	Limited to the platform area	Negligible to minor and localized
Platform Conversion	• Air emissions from diesel engines powering air compressors, generators, etc. • Pollution due to potential spills of fuels or other hazardous materials. • Noise created supply vessel, cranes, and installation.	Short-term	Compliance with federal regulations for off-road and/or marine diesel engines	Negligible to minor and localized

TABLE 11-3
Potential Impacts on Meteorology, Air Quality, and Noise

Activity	Details	Duration of Impact	Mitigation Measures	Anticipated Level of Impact
CALM Buoy Installation	• Noise created during pile driving and associated air emissions.	Short-term	Limited to the platform area	Negligible to minor and localized
Construction Vessel Operations	• Localized air emissions from diesel engines. • Engine noise.	Short-term	Compliance with federal regulations for vessel operations	Negligible to minor and localized
Operations				
Crude Oil Transfer	• Air emissions of VOC from displaced air in the VLCCs and other oil carriers. • Noise from anchoring vessels, if required.	Lifetime of Project	Compliance with BACT, MACT, Air Permits; Pipeline will be buried and covering soil will limit noise transmission	Modeled and confirmed to have acceptable impacts below NAAQS and state standards
Platform Operations	• Air emissions of byproducts of combustion from RICE. • Air emissions of VOC from piping components and tanks. • Noise from operation of equipment	Lifetime of Project	Compliance with BACT, MACT, Air Permits	Modeled and confirmed to have acceptable impacts below NAAQS and state standards
Crude Oil Carrier Operations	• Air emissions from diesel engines. • Noise from operation of equipment • Engine noise.	Lifetime of Project	Compliance with federal regulations for vessel operations	Modeled and confirmed to have acceptable impacts below NAAQS and state standards
Support Vessel Operations	• Air emissions from diesel engines. • Engine noise.	Lifetime of Project	Compliance with federal regulations for vessel operations	Modeled and confirmed to have acceptable impacts below NAAQS and state standards
Upsets and Accidents				
Pipeline and Platform Operations	• Equipment leaks may result in air emissions of VOC. • Control malfunctions of natural gas-fired generators and oxidation catalysts may result in temporary excess air emissions. • Noise from equipment used during cleanup operations	Lifetime of Project	Compliance with BACT, MACT, and air permit; Compliance with Vessel Response Plan	Negligible to minor and localized

TABLE 11-3
Potential Impacts on Meteorology, Air Quality, and Noise

Activity	Details	Duration of Impact	Mitigation Measures	Anticipated Level of Impact
Vessel Operations	• Use of surge vessel on platform will have minor VOC emissions from displaced air in the surge tank. • Noise from equipment used during cleanup operations • Engine noise	Lifetime of Project	Compliance with air permit; Compliance with Vessel Response Plan	Negligible to minor and localized
Decommissioning				
Platform and Facility Removal	• Negligible air emissions from underwater infrastructure. • Noise from construction equipment.	Short-term	Compliance with USACE Permit conditions	Negligible to minor and localized
Facility Abandonment in Place	• Negligible air emissions. • Noise from construction equipment • Engine noise	Short-term	Compliance with USACE and NPDES Permit conditions	Negligible to minor and localized
Support Vessel Operations	• Air emissions from diesel engines. • Noise from operation of equipment • Engine noise.	Short-term	Compliance with federal regulations for vessel operations	Negligible to minor and localized

11.4.1 Air Quality

In this section, air quality is defined as a measurement of pollutants in ambient air. Air quality as described here may be affected by proposed construction, operation, and decommissioning of the Project. A combination of short- and long-term minor impacts on air quality may be expected during construction, operation, and decommissioning of the Project. Short-term, negligible impacts on air quality may result from the construction of the DWP. This distinction and organization of the document allows for more focused agency review at the state and federal level.

The remainder of this section is presented in the following sub-sections:

- Construction
- Operation
- Decommissioning

11.4.1.1 Construction and Installation

BMOP estimated construction-related emissions of criteria pollutants, HAPs, and GHGs for the Project. The project schedule currently considers a start of construction in 2022 and continuing into 2023. To ensure a conservative analysis for this report, BMOP has estimated emissions assuming that all construction associated with the project will occur in 2022. Potential air quality impacts associated with construction of the Project will include emissions from the use of equipment powered by gasoline or diesel engines as well as engine emissions from marine vessels. Construction activities will also result in engine emissions from workers commuting. Fugitive dust may also be generated by vehicular traffic on paved roads. The construction emissions will be temporary in nature and will not significantly affect regional air quality. A

detailed summary of the construction emissions calculation methodology, including emission factors and associated references are provided in **Appendix G-1** of Volume IIa. **Table 11-4** provides the summary of construction emissions for the Project.

TABLE 11-4
Summary of Total Offshore Pipeline Construction Emissions

	CO (tpy)	NO_X (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	VOC (tpy)	Total HAPs (tpy)	CO_2e (tpy)
2022 Emissions								
Diesel non-road equipment	398.00	2,107.87	69.80	69.33	1.57	46.41	4.83	186,564
Diesel and gasoline road equipment	0.13	0.01	<0.01	<0.01	<0.01	<0.01	0.18	21.22
Fugitive dust from paved roads	--	--	0.02	0.01	--	--	--	--
Total	**398.13**	**2,107.88**	**69.83**	**69.34**	**1.58**	**46.42**	**5.01**	**186,585**

11.4.1.2 Startup and Commissioning

Startup of the DWP will consist of commissioning the engine-driven equipment at the WC 509 Platform Complex. This combustion equipment commissioning will be over a short-time period. The emissions will be byproducts of combustion from diesel and natural gas. Following the commissioning period, emissions will be in compliance with the air permit and applicable engine regulations. As such, this short-term activity will be negligible or minor in the very short duration prior to transitioning into operations.

11.4.1.3 Operations

BMOP estimated operation-related emissions of criteria pollutants, HAPs, and GHGs for the Project. Potential air quality impacts associated with the operation of the Project will include emissions from the loading of crude oil, the use of equipment powered by natural gas or diesel stationary engines, emissions from storage vessels, fugitive equipment leaks, and emissions from diesel-engine powered marine vessels. A detailed summary of the operation emissions calculation methodology, including emission factors and associated references are provided in **Appendix G-1** (Volume IIa) for stationary sources and mobile sources. **Tables 11-5**, **6**, and **7** provide the summary of operation emissions for the Project for both stationary and mobile sources.

TABLE 11-5
WC 509 Stationary Sources Potential Emissions Summary

	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	H_2S (tpy)	H_2SO_4 (tpy)	Total HAPs (tpy)	CO_2e (tpy)
Marine Loading										
Uncontrolled Loading	--	--	21,840	--	--	--	9.49	--	1,224	--
Platform A Sources										
Aviation Fuel Tank	--	--	5.12E-4	--	--	--	--	--	7.65E-5	--
Platform B Sources										
Natural Gas Generators (x2)	22.48	44.96	15.74	0.05	0.80	0.80	--	2.34E-3	4.22	12,871
Emergency Diesel Generator	1.06	0.58	1.06	0.07	0.04	0.04	--	2.23E-3	1.11E-3	115.2
Platform B Cranes (x2)	2.05	11.97	0.97	1.48	0.21	0.21	--	0.05	0.06	2,383
Platform B Cranes Diesel Tank #1	--	--	1.93E-3	--	--	--	--	--	2.65E-4	--
Platform B Cranes Diesel Tank #2	--	--	1.93E-3	--	--	--	--	--	2.65E-4	--
Firewater Pump Engine	0.21	0.19	0.21	0.02	0.01	0.01	--	7.22E-4	3.58E-4	37.22
Primary Diesel Tank	--	--	0.01	--	--	--	--	--	1.17E-3	--
Surge Tank #1	--	--	3.73	--	--	--	--	--	0.07	--
Platform C Sources										
Firewater Pump Engine	0.21	0.19	0.21	0.02	0.01	0.01	--	7.22E-4	3.58E-4	37.22
Fugitive Sources										
Total Fugitive Emissions	--	--	18.65	--	--	--	0.005	--	1.91	1,060
Total	**26.02**	**57.88**	**21,881**	**1.64**	**1.07**	**1.07**	**9.50**	**0.05**	**1,230**	**16,503**

TABLE 11-6
WC 148 Stationary Sources Potential Emissions Summary

	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	H_2S (tpy)	H_2SO_4 (tpy)	Total HAPs (tpy)	CO_2e (tpy)
WC 148 Platform Sources										
WC 148 Fugitive Emissions	--	--	0.71	--	--	--	3.11E-4	--	0.04	--
Total	**--**	**--**	**0.71**	**--**	**--**	**--**	**3.11E-4**	**--**	**0.04**	**--**

TABLE 11-7
Offshore Mobile Sources Potential Emissions Summary

	NO_X (tpy)	CO (tpy)	VOC (tpy)	SO_2 (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	H_2SO_4 (tpy)	HAPs (tpy)	CO_2e (tpy)
Tugboats/Support									
Main Engines	105.3	24.14	2.82	3.12	1.76	1.71	0.10	0.05	5,026
Generator Set	20.89	4.50	1.66	0.48	1.52	1.52	0.01	0.02	771.8
AHT Winch Engines	1.61	0.35	0.13	0.04	0.12	0.12	1.15E-3	1.41E-3	59.37
4-Point Dive Support									
Main Engines	31.10	7.13	0.83	0.92	0.52	0.50	0.03	0.01	1,484
Generators	1.79	0.38	0.14	0.04	0.13	0.13	1.28E-3	1.56E-3	65.97
Air Compressors	0.59	0.13	0.05	0.01	0.04	0.04	4.20E-4	5.12E-4	21.65
Dive Compressors	0.62	0.13	0.05	0.01	0.05	0.05	4.48E-4	5.47E-4	23.09
Crane Engines	0.75	0.16	0.06	0.02	0.05	0.05	5.36E-4	6.45E-4	27.62
Supply Vessels									
Main Engines	13.82	3.17	0.37	0.41	0.23	0.22	0.01	6.35E-3	659.7
Diesel Generators	1.79	0.38	0.14	0.04	0.13	0.13	1.28E-3	1.56E-3	65.97
Helicopter									
Platform A Helicopter	0.25	0.69	0.52	0.04	0.02	0.26	1.89E-3	0.35	55.15
VLCC									
Main Engines	358.6	82.18	9.59	10.62	5.99	5.82	0.33	0.16	17,112
Diesel Generators	201.2	46.11	5.38	5.96	3.36	3.26	0.19	0.09	9,601
Total	**738.3**	**169.5**	**21.73**	**21.71**	**13.92**	**13.81**	**0.68**	**0.70**	**34,974**

11.4.1.4 Decommissioning

To ensure a conservative analysis for this report, BMOP has estimated emissions assuming that decommissioning of the DWP will occur in 2024. Potential air quality impacts associated with the decommissioning of the DWP will primarily include emissions from the use of non-road equipment powered by diesel engines, however, emissions from on-road vehicular commuting is conservatively included based on the estimates used for construction and installation. As such, emissions from criteria pollutants, HAPs, GHG, and fugitive dust are expected as part of the decommissioning of the DWP.

The decommissioning emissions will be temporary in nature and will not significantly affect regional air quality. A detailed summary of the decommissioning emissions calculation methodology, including emission factors and associated references are provided in **Appendix G-1** of Volume IIa. **Table 11-8** provides the summary of decommissioning emissions for the Project.

TABLE 11-8
Summary of Total Offshore Pipeline Decommissioning Emissions

	CO (tpy)	NO_X (tpy)	PM_{10} (tpy)	$PM_{2.5}$ (tpy)	SO_2 (tpy)	VOC (tpy)	Total HAPs (tpy)	CO_2e (tpy)
2024 Emissions								
Diesel non-road equipment[1]	11.00	50.18	1.53	1.51	0.05	0.87	0.32	6,227
Diesel and gasoline road equipment	0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.18	4.95
Fugitive dust from paved roads	--	--	0.01	<0.01	--	--	--	--
Total	**11.03**	**50.19**	**1.54**	**1.52**	**0.06**	**0.88**	**0.50**	**6,232**

11.4.2 Noise

11.4.2.1 Construction and Installation

Operation of internal combustion engines used to power barges and service vessels will be among the most prevalent noise sources during construction and installation of the CALM Buoys, PLEMs, pipelines, and support components. Operation of the diesel engines aboard installation equipment is anticipated to produce noise levels similar to those produced by diesel engine-powered construction equipment used on land, for which typical noise levels are available. The intermittent, short-term nature of construction noise and the distance between potential sound-sensitive sites in Jefferson County, Texas, and the proposed construction area indicate that potential impacts from construction noise will be minimal. **Table 11-9** lists the primary noise sources that could result from construction activities and provides estimated noise levels in air at various distances from construction activities. Due to the decrease of sound level with distance (sound decreases by 6 decibels each time the distance doubles), at a distance of 1,000 feet (304.8 meters), noise levels are approximately 50 percent of the source sound pressure levels.

Offshore recreational boaters and fishermen that travel near the DWP during construction could be exposed to construction noise. Given the temporary nature of construction events and the implementation of a Safety Zone to keep non-Project-related vessels away from offshore construction activities, potential noise impacts will be short term and minor. As shown in **Table 11-9**, noise levels at 500 feet are generally below 60 decibels, and below 55 decibels at 1,000 feet. Given the distance to the nearest noise-sensitive areas onshore and the separation distance from offshore recreational boaters and fishermen, there will be no significant

noise impact during construction of the CALM Buoys, PLEMs, pipelines, and additional offshore components.

TABLE 11-9
Noise Sources During Construction

Construction Equipment Source	Sound Pressure Level[a]	Sound Pressure Level Distance(dBA) on surface			
		500 feet	1,000 feet	2,500 feet	1 mile
Derrick barge main engine	90	46.4	40.4	32.4	25.9
Material barge main engine	90	46.4	40.4	32.4	25.9
Quarters barge main engine	90	46.4	40.4	32.4	25.9
Work boat main engine	90	46.4	40.4	32.4	25.9
Crew boat main engine	90	46.4	40.4	32.4	25.9
Derrick barge crane engine	85	41.4	35.4	27.4	20.9
Derrick barge bow thrusters	85	41.4	35.4	27.4	20.9
Vessel generator engines[b]	82	38.4	32.4	24.4	17.9
Pile hammer	100	56.4	50.4	42.4	35.9
Worst case/all equipment	102	58.4	52.4	44.4	37.9

[a] Sound pressure level at 3.048 feet
[b] Based on 250-horsepower engine

Underwater noise will be generated by pile driving, offshore pipeline construction, and vessel traffic. Pipeline construction activities will be performed by jetting and/or trenching. During pipeline construction most of the underwater noise generated will be from the vessels that position the laybarge / jet barge anchors and winching of the anchor cables. Noise emissions from offshore construction activities are presented in Topic Report 6, "Wildlife and Protected Species," in Volume IIa – Offshore Project Components (Public).

11.4.2.2 Operations

Helicopter and Service Vessels

Other sources of noise associated with DWP operations will consist of noise from arriving and departing helicopters, service vessel traffic, and VLCC traffic. Noise from these sources will be greater than those transmitted from normal DWP operations. Helicopter and service vessels will be periodic and conducted as necessary to transport personnel and material to and from the mainland.

Service vessels and helicopters will be the primary modes for transporting personnel and supplies between service bases and the DWP. Sound generated from service vessel traffic will be transient. The intensity and frequency of the noise emissions will be highly variable, both between and among these sources. Offloading operations typically will require two tugboats to assist the vessels with mooring to their assigned CALM Buoy. Noise associated with supply vessels and tugboats offshore will be diminished over distance to any onshore noise-sensitive receptors. In addition, ports are typically located in port/industrial areas where vessel and mechanical noises do not normally affect the community. Most high-speed vessel operations will occur well offshore and will have little impact on noise levels at onshore locations.

DWP Platform Operation

Operations at the DWP platforms will use power-generating equipment (engines), pumps, and other rotating equipment that create noise. Sound power levels and sound pressure levels at various distances are listed in **Table 11-10** for the major continuously or near-continuously operating noise producing equipment during operation of the platform. Intermittent sources such as the emergency generator engines and fire water pump engines will not contribute significantly to operational noise due to the intermittent nature of their operation. The sound levels at 1,000 feet, 0.9 nautical miles (1 mile), and 8.9 nautical miles (10 miles) reflect attenuation of sound over distance due to hemispherical spreading. As indicated in the table, noise generated at the platform will not affect noise-sensitive areas onshore due to the long distance from the DWP to shore.

TABLE 11-10
DWP Platform Noise during Operations

Equipment	Sound Power (LwA)	Sound Pressure Level Distance(dBA) on the surface		
		1,000 feet	1 mile	10 miles
Generators	125	51.7	34.0	9.7
Crane Diesel Engine	115	47.6	31.3	8.9
Pumps (typical)	102.4	42.4	27.9	7.9

11.4.2.3 Decommissioning

Section 1.6, "Decommissioning," in Topic Report 1, "Project Description, and Purpose and Need," (Volume IIa) presents information regarding the decommissioning of offshore components. Noise produced during decommissioning activities involving abandonment of offshore components will be at levels equal to or less than noise produced during construction. Noise from decommissioning will cease upon completion of activities.

11.5 CUMULATIVE IMPACTS

A complete discussion of cumulative impacts is included in **Appendix C,** "Framework for Cumulative Impacts Analysis" (Volume IIa).

11.6 MITIGATION MEASURES

11.6.1 Air Quality

The emissions from the Project will need to meet rigorous technology and operational requirements to obtain and comply with the required air emissions permits. The air permits require a top-down evaluation of mitigation measures and requires selection and use of the most-effective air pollution control that is both technically and economically feasible. A detailed review of the Best Available Control Technology (BACT) applicable for the Project is provided in Appendix C-4 of Volume I, and the MACT proposal is included in Appendix C-6 of Volume I.

As part of these air pollution mitigation measures, BMOP will use submerged fill loading of VLCC and other large crude-carrying vessels, as well as a VOC Best Management Plan to minimize emissions from loading, consistent with BACT and MACT. BMOP will also utilize natural gas-fired generators that meet the best demonstrated technology of NSPS, and oxidation catalysts for further reduction of CO and VOCs. All diesel engines will also be certified by the manufacturer to meet the latest applicable tier requirements, corresponding to their size, use, and date of manufacture. As discussed below, with these mitigation

measures, the ambient impacts have been quantified and assessed to confirm they are protective of the NAAQS.

11.6.2 Ambient Noise

Due to the distance from the pipeline and terminal construction locations to onshore receptors and with the Safety Zone in place, additional noise mitigation measures will not be necessary for the Project.

11.7 SUMMARY OF POTENTIAL IMPACTS

11.7.1 Air Quality

As provided in **Appendix G** of Volume IIa, total potential impacts from the Project will not result in direct, indirect, or cumulative impacts in violation of the NAAQS.

All modeled pollutants resulted in concentrations below their applicable Class II SIL except for the NO_2 1-hr standard (see **Table 11-11**). As such, a cumulative impacts analysis was performed for NO_2 1-hour emissions.

TABLE 11-11
Significance Analysis Results

Pollutant	Averaging Period	Concentration Basis	Date/Time	Modeled Concentration (µg/m³)	Class II SIL (µg/m³)	Exceed SIL? (Yes/No)
NO_2	1-Hour	5-year avg. H1H	2012-2017	19.60	7.5	Yes
	Annual	H1H in any year	2012	0.30	1	No
SO_2	1-Hour	5-year avg. H1H	2012-2017	1.16	7.8	No
	3-Hour	H1H in any year	12112303	1.14	25	No
	24-Hour	H1H in any year	13102424	0.22	5	No
	Annual	H1H in any year	2012	0.01	1	No
$PM_{2.5}$	24-Hour	H1H in any year	2013	0.26	1.2	No
	Annual	H1H in any year	2012	0.01	0.2	No
PM_{10}	24-Hour	H1H in any year	13102424	0.22	5	No
	Annual	H1H in any year	2012	0.01	1	No
CO	1-Hour	H1H in any year	17021213	16.50	2,000	No
	8-Hour	H1H in any year	12080808	5.03	500	No

As described in air quality dispersion modeling report, should modeled design concentrations of the significance analysis be less than the applicable SIL, a cumulative impacts analysis is not required. If modeled impacts are greater than the SIL, a cumulative impacts analysis, including regional inventory sources and ambient background concentrations is performed to demonstrate that the Project neither causes nor contributes to any NAAQS exceedances at the nearest shoreline.

The modeled results from the NO_2 1-hour averaging period exceeded the SIL; therefore, NO_2 1-hour emissions from the Project and all applicable regional sources were modeled as described in the air quality dispersion modeling report. The NO_2 ambient background concentration was added to the modeled design concentration and compared to the NO_2 1-hr primary NAAQS. **Table 11-12** summarizes the results from the NO_2 1-hour cumulative impacts analysis.

TABLE 11-12
Significance Analysis Results

Pollutant	Averaging Period	Project + Inventory Modeled Concentration[a] ($\mu g/m^3$)	Background Monitor Concentration ($\mu g/m^3$)	Cumulative Impacts ($\mu g/m^3$)	Primary NAAQS ($\mu g/m^3$)	Exceed NAAQS? (Yes/No)
NO_2	1-Hour	48.09	38.25	86.34	188	No

[a] Results based on the 8th highest high of the 5-year average modeled results, for 2012-2017.

As shown above, model results from the cumulative impacts analysis are below the primary NAAQS for the NO_2 1-hour NAAQS and demonstrates that the Project will not result in direct, indirect, or cumulative impacts that will result in a violation of the NAAQS.

11.7.2 Ambient Noise

Short-term, minor impacts on the airborne noise environment may occur during construction of the CALM Buoys, PLEMs, pipelines and additional offshore components. Activities that will produce the greatest amount of noise near shore will be from helicopters and support vessels. Construction activities associated with the DWP are not expected to affect onshore noise levels due to the distance between shore and DWP location. Offshore recreational boaters and fishermen that travel near the construction site could be exposed to construction noise. However, given the temporary nature of construction events, potential noise impacts will be short term and minor.

Long-term, minor impacts on the above-water noise environment in the immediate vicinity of the DWP platforms may occur during routine operations. Noise will be created by the operation of various equipment and power systems on the DWP platform and vessels at the DWP. Due to the distance between the onshore noise receptors and the DWP, there will be no discernible noise effects on onshore receptors. Although operational noise could result in annoyance to recreational boaters and fishers near the DWP, the Safety Zone to be established around the DWP will minimize the potential for recreational boaters and fishing vessels to operate in the immediate vicinity of the DWP. Each SPM buoy with a moored crude oil carrier will be encircled by a Safety Zone that limits access to only Project-related vessel traffic and strictly prohibits anchoring or access by other vessels including fishing boats. Overall, potential operational noise impacts will be short-term and minor.

11.8 REFERENCES

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