

UNITED STATES GOVERNMENT
MEMORANDUM

August 26, 2026

To: Public Information (MS 5030)
From: Plan Coordinator, FO, Plans Section (MS 5231)
Subject: Public Information copy of plan
Control # - S-08235
Type - Supplemental Development Operations Coordinations Document
Lease(s) - OCS-G25098 Block - 546 Mississippi Canyon Area
Operator - LLOG Exploration Offshore, L.L.C.
Description - Subsea Wells
Rig Type - Not Found

Attached is a copy of the subject plan.

It has been deemed submitted as of this date and is under review for approval.

Tehirah Barkum
Plan Coordinator

Site Type/Name	Botm Lse/Area/Blk	Surface Location	Surf Lse/Area/Blk
WELL/SS007	G25098/MC/546	6314 FNL, 7440 FWL	G25098/MC/546
WELL/SS007ALT	G25098/MC/546	6221 FNL, 7490 FWL	G25098/MC/546

**LLOG Exploration Offshore, L.L.C.
1001 Ochsner Blvd. Suite 100
Covington, Louisiana 70433**

**SUPPLEMENTAL
DEVELOPMENT OPERATIONS COORDINATION DOCUMENT
LEASES OCS-G-25098 & OCS-G-27277
MISSISSIPPI CANYON BLOCKS 546 & 503**

“WHO DAT”

PUBLIC INFORMATION COPY

PREPARED BY:

**Sue Sachitana
Regulatory Specialist
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Dated: July, 2026

LLOG EXPLORATION OFFSHORE, L.L.C.
SUPPLEMENTAL
DEVELOPMENT OPERATIONS COORDINATION DOCUMENT
OCS-G-25098 & OCS-G-27277 LEASES
MISSISSIPPI CANYON BLOCKS 546 & 503

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APPENDIX A
PLAN CONTENTS
(30 CFR PART 550.211 AND 550.241)

A. Plan Contents

Lease OCS-G-25098 Lease, Mississippi Canyon Block 546 was acquired by Nexen Petroleum Offshore U.S.A., Inc. at the Central Gulf of Mexico OCS Sale No. 185 held on March 19, 2003. The lease was issued with an effective date of June 11, 2003, and a primary term ending date of May 31, 2013. Effective May 15, 2012 Nexen Petroleum Offshore U.S.A., Inc designated LLOG Exploration Offshore, L.L.C. as operator of the E ½ of Block 546, Mississippi Canyon from 13,000' SSTVD to 18,500' SSTVD.

LLOG filed a Supplemental Development Operations Coordination Document (S-7659) which was approved July 3, 2014 to drill, complete and produce the OCS-G-25098 Lease, Mississippi Canyon 546 subsea well No. 004 (G-1) and No. 005 (G-2). The Mississippi Canyon 546 SS004 (G-1) was spud on November 23, 2014 and placed on production April 10, 2015. The Mississippi Canyon 546 SS006 ST01 (G-2) was spud on November 8, 2018 and placed on production March 4, 2019.

LLOG filed a Supplemental Development Operations Coordination Document (S-7708) which was approved on February 2, 2015 to drill, complete and produce the OCS-G-25098 Lease, Mississippi Canyon 546 subsea well No. 006 (G-3). The Mississippi Canyon 546 SS005 ST01 (G-3) was spud April 9, 2015 and placed on production August 6, 2015.

This Supplemental Development Operations Coordination Document is requested to cover the drilling, completion, and to produce the OCS-G-25098 Lease, Mississippi Canyon 546 for the MC 546 007 (G-5) location. The surface location will be from the (G-5) manifold at Mississippi Canyon 546, OCS-G-25098 Lease. The MC 546 SS005 well jumper will be removed and replaced with the MC 546 SS007 well jumper. LLOG will remove the existing Mississippi Canyon (MC) 503 Well SS001 jumper (SN 18212) from the existing MC 503 A Manifold and re-install a new well jumper in the same slot for MC 503 Well SS001. MC 503 Well SS001 will continue to utilize the existing Location A Dual Lease Term pipelines and umbilical to flow back to the LLOG-operated MC 547 "A" (Who Dat) manned Platform for processing.

The operations proposed will not utilize pile-driving, nor is Operator proposing any new pipelines expected to make landfall.

B. Location

Included are the following attachments:

Attachment A-1: Form BOEM 137 – OCS Plan Information Form

Attachment A-2: Well Location Plats

Attachment A-3: Bathymetry Map

Attachment A-4 – Pay.Gov Receipt of Payment

Attachment A-5 – Conceptual Field Development

C. Safety and Pollution Prevention Features

LLOG will utilize a DP semi-submersible drilling rig or a DP drillship for the proposed operations. A description of the drilling unit is included on the OCS Plans Information Form. Rig specifications will be made part of the Application for Permit to Drill.

Safety of personnel and protection of the environment during the proposed operations is of primary concern with LLOG, and mandates regulatory compliance with the contractors and vendors associated with the proposed operations as follows:

The rig will be equipped with safety and fire-fighting equipment required to comply with United States Coast Guard (USCG) regulations. Appropriate lifesaving equipment such as life rafts, life jackets, ring buoys, etc. as prescribed by the USCG, will be maintained on the rig at all times.

Safety features on the drilling unit will include well control, pollution prevention, and blowout prevention equipment as described in Bureau of Safety Environment and Enforcement (BSEE) regulations 30 CFR 250 C, D, E, O, Q and S; and as further clarified by BSEE Notices to Lessees, and current policy making invoked by the BSEE, Environmental Protection Agency (EPA) and the USCG.

Pollution prevention measures include installation of curbs, gutters, drip pans, and drains on drilling deck areas to collect all contaminants and debris. Compliance will be maintained with the EPA NPDES Permit. The rig will be monitored daily and any waste or fuel resulting in pollution of the Gulf waters will be reported to the representative in charge for immediate isolation and correction of the problem. All spills will be reported to the appropriate governmental agencies.

D. Storage Tanks and Vessels

The following table details the storage tanks and/or production vessels that will store oil (capacity greater than 25 bbls. or more) and be used to support the proposed activities (MODU, barges, platforms, etc.):

Type of Storage Tank	Type of Facility	Tank Capacity (bbls)	Number of tanks	Total Capacity (bbls)	Fluid Gravity (API)
Fuel Oil Storage Tank	Drillship	16,564	1	16,564	No. 2 Diesel - 43
Fuel Oil Storage Tank		16,685.5	1	16,685.5	No. 2 Diesel - 43
Fuel Oil Settling Tank		836.6	2	1,673.2	No. 2 Diesel - 43
Fuel Oil Day Tanks		836.6	2	1,673.2	No. 2 Diesel - 43

Type of Storage Tank	Type of Facility	Tank Capacity (bbls)	Number of tanks	Total Capacity (bbls)	Fluid Gravity (API)
Fuel Oil (Marine Diesel)	DP Semi-Submersible	164	1	164	30
Fuel Oil Day		367	2	734	30
Emergency Generator		31	1	31	30
Forward Hull Fuel Oil		4634	2	9268	30
Lower Aft Hull Fuel Oil		3462	2	6924	30
Lube Oil Services		117 10.5 4.6	1 1 1	132.1	45
Dirty Lube Oil		38 28	1 1	66	45
Dirty Bilge		190	4	760	10

E. Pollution Prevention Measures

Not applicable. The State of Florida is not an affected State by the proposed activities in this plan.

F. Additional Measures

LLOG does not propose any additional safety, pollution prevention, or early detection measures, beyond those required in 30 CFR 250.

G. Cost Recovery Payment

Included as Attachment A-4 is the Pay.gov receipt **ID 77455717820** in the amount of \$5,565.00 for cost recovery fee associated with the Supplemental Development Operations Coordination Document for the OCS-G 25098 & OCS-G-27277 Leases, Mississippi Canyon Blocks 546 & 503.

OCS PLAN INFORMATION FORM

Attachment A-1 (Proprietary Information)

OCS PLAN INFORMATION FORM

General Information									
Type of OCS Plan:		Exploration Plan (EP)		Development Operations Coordination Document (DOCD)					
				Supplemental					
Company Name: LLOG EXPLORATION OFFSHORE, L. L. C.				BOEM Operator Number: 02058					
Address:				Contact Person: SUE SACHITANA					
1001 OCHSNER BLVD, SUITE 100				Phone Number: (985) 801-4300					
COVINGTON, LA 70433				E-Mail Address: SUE.SACHITANA@LLOG.COM					
If a service fee is required under 30 CFR 550.125(a), provide the				Amount paid		\$5,565.00		Receipt No.	
								77455717820	
Project and Worst Case Discharge (WCD) Information									
Lease(s): OCS-G-25098		Area: MC		Block: 546		Project Name (If Applicable): WHO DAT			
Objective(s)		☒ Oil	☐ Gas	☐ Sulphur	☐ Salt	Onshore Support Base(s): FOURCHON, LA			
Platform/Well Name: MC 546 SS007		Total Volume of WCD: ~7.6 MMBO				API Gravity: 28°			
Distance to Closest Land (Miles): 38				Volume from uncontrolled blowout: 109,127 BOPD					
Have you previously provided information to verify the calculations and assumptions for your WCD?								☒ Yes	☐ No
If so, provide the Control Number of the EP or DOCD with which this information was provided								S-7659	
Do you propose to use new or unusual technology to conduct your activities?								☐ Yes	☒ No
Do you propose to use a vessel with anchors to install or modify a structure?								☐ Yes	☒ No
Do you propose any facility that will serve as a host facility for deepwater subsea development?								☐ Yes	☒ No
Description of Proposed Activities and Tentative Schedule (Mark all that apply)									
Proposed Activity				Start Date		End Date		No. of Days	
Exploration drilling				SEE ATTACHED SCHEDULE					
Development drilling									
Well completion									
Well test flaring (for more than 48 hours)									
Installation or modification of structure									
Installation of production facilities									
Installation of subsea wellheads and/or manifolds									
Installation of lease term pipelines									
Commence production									
Other (Specify and attach description)									
Description of Drilling Rig					Description of Structure				
☐	Jackup	☒	Drillship	☐	Caisson	☐	Tension leg platform		
☐	Gorilla Jackup	☐	Platform rig	☐	Fixed platform	☐	Compliant tower		
☐	Semisubmersible	☐	Submersible	☐	Spar	☐	Guyed tower		
☒	DP Semisubmersible	☐	Other (Attach Description)	☐	Floating production system	☐	Other (Attach Description)		
Drilling Rig Name (If Known):									
Description of Lease Term Pipelines									
From (Facility/Area/Block)			To (Facility/Area/Block)			Diameter (Inches)		Length (Feet)	

Supplemental Development Operations Coordination Document
OCS-G 25098 Lease
Mississippi Canyon Block 546

Proposed Activity Schedule

<i>Proposed Activity</i>	<i>Start Date</i>	<i>End Date</i>	<i>No. of Days</i>
Drill MC 546 007 (G5)	2/1/2027	4/2/27	60
Complete MC 546 007 (G5)	5/11/2027	7/10/27	60
MC 546 SS005 Well Jumper Removal	8/2/2027	8/7/2027	5
MC 546 SS007 well jumper installation	8/8/2027	8/18/2027	9
Hook-up and Commence Production	8/10/2027	8/10/2027	1
MC 503 Well SS 001 Jumper Removal	6/11/2027	6/13/2027	5
MC 503 Well SS 001 Jumper Re-Installation	6/13/2027	6/15/2027	9
Hook-up and Commence Production	6/15/2027	6/16/2027	1

*LLOG will probably drill and complete the MC 547 007 well in 2027. We are asking for several years in the event something unexpected happens and our schedule has to change. We would also like to have air emission days for unplanned workovers or sidetracks as well.

Year	Number of Days
2027	154
2028	154
2029	154
2030	120
2031	120
2032	120
2033	120
2034	120
2035	120
2036	120

OCS PLAN INFORMATION FORM (CONTINUED)
Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location									
Well or Structure Name/Number (If renaming well or structure, reference previous name): MC 546 SS007				Previously reviewed under an approved EP or DOCD?			Yes	☒	No
Is this an existing well or structure?			Yes		No	If this is an existing well or structure, list the Complex ID or API No.			
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?						☒	Yes		No
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 109,127 BOPD			For structures, volume of all storage and pipelines (Bbls):			API Gravity of fluid		28°
	Surface Location			Bottom-Hole Location (For Wells)			Completion (For multiple completions, enter separate lines)		
Lease No.	OCS 25098			OCS			OCS OCS		
Area Name	MISSISSIPPI CANYON								
Block No.	546								
Blockline Departures (in feet)	N/S Departure: F <u>N</u> L 6,314			N/S Departure: F <u> </u> L			N/S Departure: F <u> </u> L N/S Departure: F <u> </u> L N/S Departure: F <u> </u> L		
	E/W Departure: F <u>W</u> L 7,440			E/W Departure: F <u> </u> L			E/W Departure: F <u> </u> L E/W Departure: F <u> </u> L E/W Departure: F <u> </u> L		
Lambert X-Y coordinates	X: 973,680.00			X:			X: X: X:		
	Y: 10,321,366.00			Y:			Y: Y: Y:		
Latitude/Longitude	Latitude 28° 25' 33.148" N			Latitude			Latitude Latitude Latitude		
	Longitude 89° 4' 29.333" W			Longitude			Longitude Longitude Longitude		
Water Depth (Feet): 2,566				MD (Feet):		TVD (Feet):		MD (Feet): MD (Feet):	
Anchor Radius (if applicable) in feet:								TVD (Feet): TVD (Feet):	
Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)									
Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate			Length of Anchor Chain on Seafloor		
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					

OCS PLAN INFORMATION FORM (CONTINUED)
Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location									
Well or Structure Name/Number (If renaming well or structure, reference previous name): MC 546 SS007 ALT				Previously reviewed under an approved EP or DOCD?			Yes	☒	No
Is this an existing well or structure?			Yes		No	If this is an existing well or structure, list the Complex ID or API No.			
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?						☒	Yes		No
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): 109,127 BOPD			For structures, volume of all storage and pipelines (Bbls):			API Gravity of fluid		28°
	Surface Location			Bottom-Hole Location (For Wells)			Completion (For multiple completions, enter separate lines)		
Lease No.	OCS 25098			OCS			OCS OCS		
Area Name	MISSISSIPPI CANYON								
Block No.	546								
Blockline Departures (in feet)	N/S Departure: F <u>N</u> L 6,220.74			N/S Departure: F <u> </u> L			N/S Departure: F <u> </u> L N/S Departure: F <u> </u> L N/S Departure: F <u> </u> L		
	E/W Departure: F <u>W</u> L 7,490.14			E/W Departure: F <u> </u> L			E/W Departure: F <u> </u> L E/W Departure: F <u> </u> L E/W Departure: F <u> </u> L		
Lambert X-Y coordinates	X: 973,730.14			X:			X: X: X:		
	Y: 10,321,459.26			Y:			Y: Y: Y:		
Latitude/ Longitude	Latitude 28° 25' 34.079" N			Latitude			Latitude Latitude Latitude		
	Longitude 89° 4' 28.789" W			Longitude			Longitude Longitude Longitude		
Water Depth (Feet): 2,566				MD (Feet):		TVD (Feet):		MD (Feet): MD (Feet):	
Anchor Radius (if applicable) in feet:								TVD (Feet): TVD (Feet):	
Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)									
Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate		Length of Anchor Chain on Seafloor			
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					
			X =	Y =					

WELL LOCATION PLATS

Attachment A-2 (Proprietary Information)

Y = 10,327,680.00



SS001 (G 25098)

1' (G 06965)

2 (G 25098)

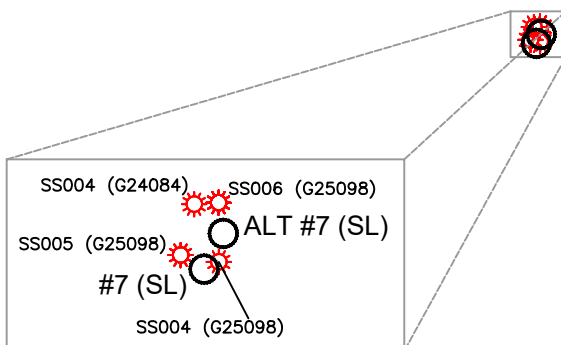
MC546

OCS-G25098

LLOG EXPLORATION OFFSHORE LLC ENI US OPERATING CO INC

2 (G 06965)

SS003 (G25098)

INSET
SCALE 1"=500'

PROPOSED WELL LOCATIONS

LOCATION	BLOCK	CALLS		COORDINATES		LATITUDE	LONGITUDE	WD	MD	TVD
'#7' (SL)	MC546	6,314.00' FNL	7,440.00' FWL	X=973,680.00	Y=10,321,366.00	28° 25' 33.148"N	89° 04' 29.333"W	2,566.00'		
'ALT #7' (SL)	MC546	6,220.74' FNL	7,490.14' FWL	X=973,730.14	Y=10,321,459.26	28° 25' 34.079"N	89° 04' 28.789"W	2,566.00'		

Y = 10,311,840.00

PUBLIC INFORMATION

LLOG EXPLORATION
OFFSHORE, L.L.C.36499 Perkins Road
Prairieville, Louisiana 70769
Tel: 225-673-2163

DOCD PLAT

PROPOSED WELLS #7 & ALT #7
OCS-G 25098 BLOCK 546
MISSISSIPPI CANYON AREA

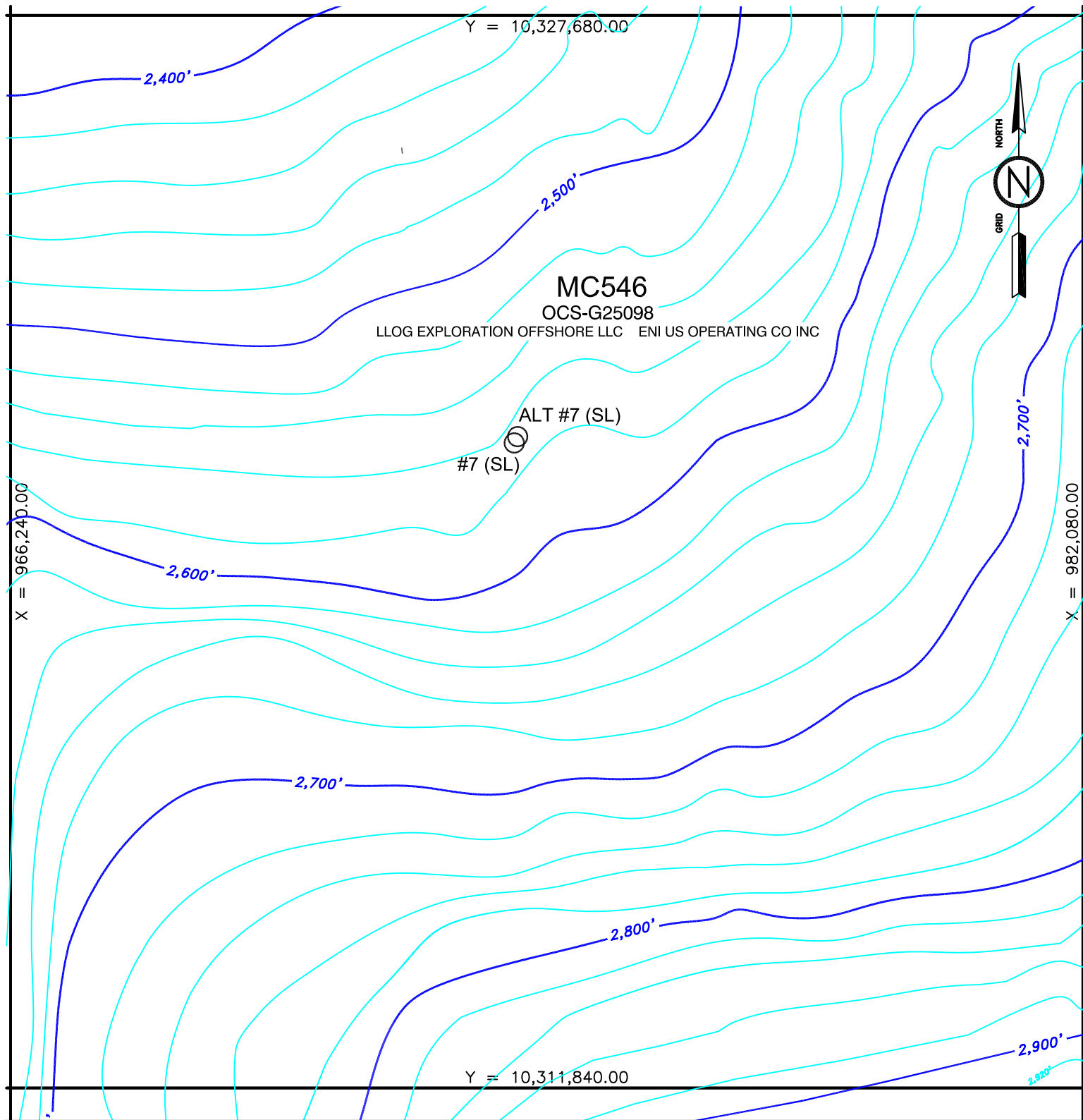
GULF OF AMERICA

DATUM: NAD 27 | SPHEROID: CLARKE 1866 | PROJECTION: U.T.M. | ZONE: 16

DRAWN BY: RJN | CHK. BY: MEK | REV. No.: 1 | JOB No.: 26-033 | DWG No.: 26-033-EXP_N07_REV1
DATE: 07/02/2026 | REV. DATE: 7/7/26 | SCALE: 1"=2,000' | SHEET 1 OF 1

BATHYMETRY MAP

Attachment A-3 (Public Information)



PROPOSED WELL LOCATIONS

LOCATION	BLOCK	CALLS		COORDINATES		LATITUDE	LONGITUDE
'#7' (SL)	MC546	6,314.00' FNL	7,440.00' FWL	X=973,680.00	Y=10,321,366.00	28° 25' 33.148"N	89° 04' 29.333"W
'ALT #7' (SL)	MC546	6,220.74' FNL	7,490.14' FWL	X=973,730.14	Y=10,321,459.26	28° 25' 34.079"N	89° 04' 28.789"W

**LLOG EXPLORATION
OFFSHORE, L.L.C.**



36499 Perkins Road
Prairieville, Louisiana 70769
Tel: 225-673-2163



WELL ASSESSMENT

**BATHYMETRY MAP
OCS-G 25098 BLOCK 546
MISSISSIPPI CANYON AREA**

GULF OF AMERICA

DATUM: NAD 27 | SPHEROID: CLARKE 1866 | PROJECTION: U.T.M. | ZONE: 16

DRAWN BY: RJN | CHK. BY: MEK | REV. No.: | JOB No.: 26-033 | DWG No.: 26-033-SM BAT-N07
DATE: 07/21/2026 | REV. DATE: | SCALE: 1"=2,000' | **SHEET 1 OF 1**

PAY GOV RECEIPT

Attachment A-4 (Public Information)

From: notification@pay.gov
To: [Sue Sachitana](#)
Subject: Pay.gov Payment Confirmation: BOEM Development/DOCD Plan - BD
Date: Tuesday, July 21, 2026 8:26:04 AM

EXTERNAL EMAIL SOURCE



An official email of the United States government

Pay.gov logo



Your payment has been submitted to the designated government agency through [Pay.gov](#) and the details are below. Please note that this is just a confirmation of transaction submission. To confirm that the payment processed as expected, you may refer to your bank statement on the scheduled payment date. If you have any questions or wish to cancel this payment, you will need to contact the agency you paid at your earliest convenience.

Application Name: BOEM Development/DOCD Plan - BD
[Pay.gov](#) Tracking ID: 284B85E2
Agency Tracking ID: 77455717820

Account Holder Name: LLOG Exploration Offshore, L. L. C.
Transaction Type: ACH Debit
Transaction Amount: \$5,565.00
Payment Date: 07/22/2026

Account Type: Business Checking
Routing Number: 065403626
Account Number: *****8160

Transaction Date: 07/21/2026 09:25:52 AM EDT
Total Payments Scheduled: 1
Frequency: OneTime

Region: Gulf of America
Contact: Susan Sachitana (985) 801-4300
Company Name/No: LLOG Exploration Offshore, LLC, 02058
Lease Number(s): 25098
Area-Block: Mississippi Canyon MC, 546
Type-Wells: Supplemental Plan, 1

THIS IS AN AUTOMATED MESSAGE. PLEASE DO NOT REPLY.

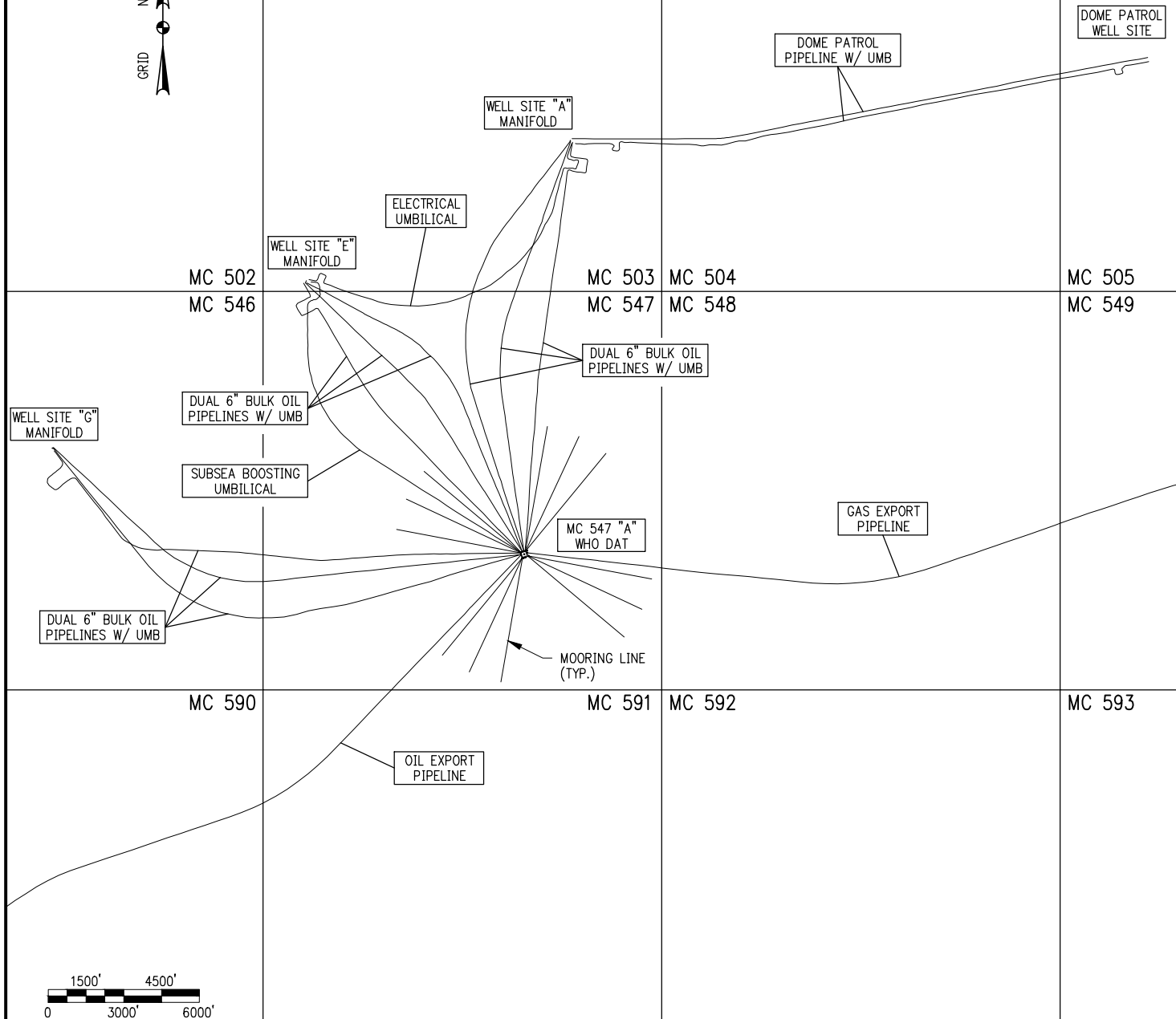


[Pay.gov](#) is a program of the U.S. Department of the Treasury, Bureau of the Fiscal Service

CONCEPTUAL FIELD DEVELOPMENT

Attachment A-5 (Public Information)

MISSISSIPPI CANYON AREA



LLDG
exploration

WHO DAT

CONCEPTUAL FIELD DEVELOPMENT

DWG NO. 205139-PIP-DG-9225-A

APPENDIX B
GENERAL INFORMATION
(30 CFR PART 550.213 AND 550.243)

A. Application and Permits

The following Federal/State applications will be submitted for the activities provided for in this Plan exclusive of the BOEM permit applications and general permits issued by the EPA and COE.

<i>Application/Permit</i>	<i>Issuing Agency</i>	<i>Status</i>
APD	BSEE	As Needed
Permits for umbilical and jumpers	BSEE	As Needed

B. Drilling Fluids

Type of Drilling Fluid	Estimated Volume of Drilling Fluid to be used per Well
Water Based (seawater, freshwater, barite)	See Appendix G, Table 1 of this Plan
Oil-based (diesel, mineral oil)	N/A
Synthetic-based (internal olefin, ester)	See Appendix G, Table 2 of this Plan

C. Production

LLOG estimates the life of reserves for the proposed development activity to be as follows:

<i>Type</i>	<i>Sand</i>	<i>Average Production Rate</i>	<i>Peak Production Rate</i>	<i>Life of Reservoir</i>
Oil	4700	1,500	3,000	5-10 yrs
Gas	4800	1,250	2,000	3-5 yrs

Note: LLOG will submit any required downhole commingling applications separate from this DOCD as required by BSEE.

D. Oil Characteristics

Oil characteristics are not required since the State of Florida is not an affected state, activities are not within Flower Garden Banks and or the Stetson Bank and no new surface facilities will be installed.

E. New Or Unusual Technology

LLOG **does not** propose using any new and/or unusual technology for the operations proposed in this Supplemental Plan.

F. Bonding Statement

The bond requirements for the activities and facilities proposed in this Supplemental Development Operations Coordination Document Plan are satisfied by an area wide bond, furnished, and maintained according to 30 CFR Part 556.900; (a) and 30 CFR 556.901 (a) and (b) and NTL No. 2015-BOEM-N04, "General Financial Assurance"; and additional security under 30 CFR 556.901(d) – (f) and NTL No. 2016-BOEM-N01, "Requiring Additional Security" as required by BOEM

G. Oil Spill Responsibility (OSFR)

LLOG Exploration Offshore, L.L.C (BOEM Co. No. 02058) will demonstrate oil spill financial responsibility for the facilities proposed in this Supplemental Development Operations Coordination Document according to 30 CFR Part 553, and NTL No. 2008-N05 "Guidelines for Oil Spill Financial Responsibility (OSFR) for Covered Facilities."

H. Deepwater Well Control Statement

LLOG Exploration Offshore, L.L.C. (BOEM Co. No. 02058) has the financial capability to drill a relief well and conduct other emergency well control operations.

I. Suspensions of Production

LLOG Exploration Offshore, L.L.C. has not filed and does not anticipate filing any requests for Suspension of Production to hold the lease(s) or unit addressed in this Development Operations Coordination Document in active status.

J. Blowout Scenario

In the event of a blowout, LLOG anticipates a rate of 109,127 BOPD with an anticipated gravity of 28.0°. LLOG would immediately activate its Regional Oil Spill Response Plan and Spill Management Team to initiate potential recovery of liquid hydrocarbons on the receiving water and review potential well intervention options. In the event a relief well is initiated, LLOG does not anticipate any delays in acquiring a DP semi-submersible type rig to conduct the proposed operations. Dependent upon the interval the well was drilled to, and potential interval for bridging over, it could take approximately 30 days to drill the replacement well.

See Attachment – B-1

BLOWOUT SCENARIO

Attachment B-1 (Public Information)



BLOWOUT SCENARIO MC 546

Created by: Adam Currier
Last Revised: 7/22/2026 Rev02
Page 1 of 6
Confidential

BLOWOUT SCENARIO

Pursuant with 30 CFR 550.213(g), 550.219, 550,250 and NTL 2015-N01 the following attachment provides a blowout scenario description, information regarding any oil spill, WCD results and assumptions of potential spill and additional measures taken to firstly enhance the ability to prevent a blowout and secondly manage a blowout scenario if it occurred.

INFORMATION REQUIREMENTS

PROPOSED PROSPECT INFORMATION

Well Surface Location	WD	X (NAD 27)	Y (NAD 27)	Latitude	Longitude
MC 546-7 OCS-G 25098	2563	973,680	10,321,366	28° 25' 33.1477"	89° 04' 29.3326"

INFORMATION REQUIREMENTS

A) Blowout scenario

The MC 546-7 well to be drilled to potential outlined in the Geological and Geophysical Information Section of this plan utilizing a typical subsea wellhead system, conductor, surface and intermediate casing strings and a MODU rig with marine riser and a subsea BOP system. A hydrocarbon influx and a well control event occurring from the objective sand is modeled with no drill pipe or obstructions in the wellbore followed by a failure of the subsea BOP's and loss of well control at the seabed. The simulated flow and worst-case discharge (WCD) results for all wells are calculated and the highest WCD is used for this unrestricted blowout scenario.

B) Estimated flow rate of the potential blowout

Category	Initial EP
Type of Activity	Drilling
Facility Location (area / block)	MC 546 (surface location)
Facility Designation	MODU
Distance to Nearest Shoreline (nautical miles)	~38
Uncontrolled Blowout (Volume per day)	Oil – 109,127 BOPD
Type of Fluid	Crude (16 API oil)

C) Total volume and maximum duration of the potential blowout

Duration of Flow (days)	70 days total (see Relief Well Response Estimate below)
Total Volume of Spill (bbls)	~7.6 MMBO based on 70 days of uncontrolled flow based on simulator models

D) Assumptions and calculations used in determining the worst-case discharge

Submitted as Attachment B-1 in the Proprietary Copy of this Plan - Omitted from Public Information Copies

E) Potential for the well to bridge over

Mechanical failure/collapse of the borehole in a blowout scenario is influenced by several factors including in-situ stress, rock strength and fluid velocities at the sand face. Given the substantial fluid velocities inherent in the WCD, and the scenario as defined where the formation is not supported by a cased and cemented wellbore, it is possible that the borehole may fall/collapse/bridge over within a span of a few days, significantly reducing the outflow of the rates. For this blowout scenario, no bridging is considered.

F) Likelihood for intervention to stop blowout

The likelihood of surface intervention to stop a blowout is based on some of the following equipment specific to potential MODU's to be contracted for this well. It is reasonable to assume that the sooner you are able to respond to the initial blowout, the better likelihood there is to control and contain the event due to reduced pressures at the wellhead, less exposure of well fluids to erode and compromise the well control equipment, and less exposure of hydrocarbons to the surface to safeguard personnel and equipment in an emergency situation. This equipment includes:

- Secondary Acoustic BOP Control System – based on specific rig contracted for work, BOP's possibly available with active secondary acoustic controls for specific BOP functions. This system can communicate and function specific BOP controls from the surface in the event of a failure of the primary umbilical control system. This system typically can establish BOP controls from the surface acoustic system package on the rig or by deploying a second acoustic package from a separate vessel of opportunity. This system may not be included on all MODU's presently in GOM. This system is typically configured to function the following:
 - Blind/shear ram close
 - Pipe ram close
 - LMRP disconnect
- ROV Intervention BOP Control System – includes one or more ROV intervention panels mounted on the subsea BOP's located on the seabed allows a ROV utilizing standard ROV stabs to access and function the specific BOP controls. These functions will be tested at the surface as part of the required BOP stump test and selectively at the seafloor to ensure proper functionality. These function include the following (at a minimum):
 - Blind/shear ram close
 - Pipe ram close
 - LMRP disconnect
 - WH disconnect
- Deadman / Autoshear function – typically fitted on DP MODU's and but to be on all MODU's operating in the GOM according to new requirements, this equipment allows for an automated pre-programmed sequence of functions to close the casing shear rams and the blind/shear rams in the event of an inadvertent or emergency disconnect of the LMRP or loss of both hydraulic and electrical supply from the surface control system.

If the intervention systems for the subsea BOP's fail, LLOG will initiate call out of a secondary containment / surface intervention system supported by the Helix Well Containment Group (HWCG) of which LLOG is a member. This system incorporates a capping stack capable of being deployed from the back of a vessel of opportunity equipped with an ROV or from the Helix Q4000 DP MODU. Based on the potential integrity concerns of the well, a "cap and flow" system can be deployed which

may include the HWCG single vessel solution utilizing the PTS processing module capable of handling up to 130,000 BOPD flowback. The vertical intervention work is contingent upon the condition of the blowing out well and what equipment is intact to access the wellbore for kill or containment operations. The available intervention equipment may also require modifications based on actual wellbore conditions. Standard equipment is available through the Helix Deepwater Containment System to fit the wellhead and BOP stack profiles used for the drilling of the above-mentioned well.

G) Availability of rig to drill relief well, rig constraints and timing of rigs

LLOG currently has one deepwater MODU under contract (Seadrill West Neptune DP drillship). In the event of a blowout scenario that does not involve loss or damage to the rig such as an inadvertent disconnect of the BOP's, then the existing contracted rig may be available for drilling the relief well and vertical intervention work. If the blowout scenario involves damage to the rig or loss of the BOP's and riser, a replacement rig or rigs will be required.

With the current activity level in the GOM, 20 deepwater MODU'S are potentially available to support the relief well drilling operations. Rig share and resource sharing agreements are in place between members of the Helix Well Containment Group. The ability to negotiate and contract appropriate rig or rigs to drill relief wells is highly probable in a short period of time. If the rig or rigs are operating, the time to properly secure the well and move the rig to the relief well site location is estimated to be about 14 to 21 days. Dynamically positioned (DP) MODU's would be the preferred option due to the logistical advantage versus a moored MODU which may add complications due to the mooring spread.

VESSELS OF OPPORTUNITY

Based on the water depth restrictions for the proposed locations the following "Vessels of Opportunity" are presently available for utilization for intervention and containment and relief well operations. These may include service vessels and drilling rigs capable of working in the potential water depths and may include moored vessels and dynamically positioned vessels. The specific conditions of the intervention or relief well operations will dictate the "best fit" vessel to efficiently perform the desired results based on the blowout scenario. The list included below illustrates specific option that may vary according to the actual timing / availability at the time the vessels are needed.

OPERATION	SPECIFIC VESSEL OF OPPORTUNITY
Intervention and Containment	• Helix Q4000 (DP Semi) • Helix Q5000 (DP Semi) • Seadrill West Vela (DP Drillship) • HWCG PTS Well Test Skid (Single Vessel Solution)
Relief Well Drilling Rigs	• Seadrill West Neptune (DP Drillship) • Sevan LA (DP Semi) • Noble Valiant (DP Drillship)
ROV / Multi-Purpose Service Vessels	• Oceaneering (numerous DP ROV vessels) • HOS Achiever, Iron Horse 1 and 2 (DP MPSV) • Helix Pipe Lay Vessel (equipped w/ 6" PL – 75,000') • Other ROV Vessels – (Chouest, HOS, Fugro, Subsea 7)
Shuttle Tanker / Barge Support	• OSG Ship Management

H) Measures taken to enhance ability to prevent blowout

Pursuant to BOEM-2010-034 Final Interim Rules, measures to enhance the ability to prevent or reduce the likelihood of a blowout are largely based on proper planning and communication, identification of potential hazards, training and experience of personnel, use of good oil field practices and proper equipment that is properly maintained and inspected for executing drilling operations of the proposed well or wells to be drilled.

When planning and designing the well, ample time is spent analyzing offset data, performing any needed earth modeling and identifying any potential drilling hazards or well specific conditions to safeguard the safety of the crews when well construction operations are underway. Once the design criteria and well design is established, the well design is modeled for the lifecycle of the wellbore to ensure potential failure modes are eliminated. Pursuant to BOEM-2010-0034 Interim Final Rules implemented additional considerations of a minimum of 2 independent barriers for both internal and external flow paths in addition to proper positive and negative testing of the barriers.

The proper training of crew members and awareness to identify and handle well control events is the best way prevent a blowout incident. Contractor's personnel and service personnel training requirements are verified per regulatory requirements per guidelines issued in BOEM-2010-034 Interim Final Rules. Drills are performed frequently to verify crew training and improve reaction times.

Good communication between rig personnel and office support personnel is critical to the success of the operations. Pre-spud meetings are conducted with rig crews and service providers to discuss, inform and as needed improve operations and well plans for safety and efficiency considerations. Daily meetings are conducted to discuss planning and potential hazards to ensure state of preparedness and behavior is enforced to create an informed and safe culture for the operations. Any changes in the planning and initial wellbore design is incorporated and communicated in a Management of Change (MOC) process to ensure continuity for all personnel.

Use of established good oil field practices that safeguard crews and equipment are integrated to incorporate LLOG's, the contractor and service provider policies.

Additional personnel and equipment will be used as needed to elevate awareness and provide real time monitoring of well conditions while drilling such as MWD/LWD/PWD tools used in the bottom hole assemblies. The tool configuration for each open hole section varies to optimize information gathered including the use of Formation-Pressure-While-Drilling (FPWD) tools to establish real time formation pressures and to be used to calibrate pore pressure models while drilling. Log information and pressure data is used by drilling engineers, geologists, and pore pressure engineers to maintain well control and reduced potential events such as well control events and loss circulation events.

Mud loggers continuously monitor return drilling fluids, drill gas levels and cuttings as well as surface mud volumes and flow rates, rate of penetration and lithology/paleo to aid in understanding trends and geology being drilled. Remote monitoring of real time drilling parameters and evaluation of geologic markers and pore pressure indicators is used to identify potential well condition changes.

Proper equipment maintenance and inspection program for same to before the equipment is required. Programmed equipment inspections and maintenance will be performed to ensure the equipment operability and condition. Operations will cease as needed to ensure equipment and well conditions are maintained and controlled for the safety of personnel, rig and subsurface equipment and the environment.



**BLOWOUT SCENARIO
MC 546**

Created by: Adam Currier
Last Revised: 7/22/2026 Rev02
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l) Measures to conduct effective and early intervention in the event of a blowout

In conjunction with the LLOG Exploration's "Well Control Emergency Response Plan" and as required by NTL 2010-N06, the following is provided to demonstrate the potential time needed for performing secondary intervention and drilling of a relief well to handle potential worst-case discharge for the proposed prospect. Specific plans are integrated into the Helix Well Containment Groups procures to be approved and submitted with the Application for Permit to Drill. Equipment availability, backup equipment and adaptability to the potential scenarios will need to be addressed based on the initial site assessment of the seafloor conditions for intervention operations. Relief well equipment such as backup wellhead equipment and tubulars will be available in LLOG's inventory for immediate deployment as needed to address drilling the relief well(s).

SITE SPECIFIC PROPOSED RELIEF WELL AND INTERVENTION PLANNING

No platform was considered for drilling relief wells for this location due to location, water depth and lack of appropriate platform within the area. For this reason, a moored or DP MODU will be preferred / required.

Relief well sites have been initially identified to address blowout scenarios for the potential geologic targets for the proposed well. A total of **3** relief well surface locations in GC 953 are proposed for locations A and A-alt. Based on actual seafloor state unforeseen at this time, the final location(s) may need to be revised. The locations have been selected based on proximity to the targets sands and potential shallow hazards.

Proposed EP Well	Proposed Relief Well	X (NAD 27)	Y (NAD 27)
GC 953 "B & B-alt" OCS-G 36062	GC 953 RW1 Relief Well #1	2,450,360.00'	9,811,480.00'
GC 953 "C & C-alt" OCS-G 36062	GC 953 RW2 Relief Well #2	2,448,162.00'	9,809,086.00'
	GC 953 RW3 Relief Well #3	2,448,528.00'	9,806,982.00'

RELIEF WELL RESPONSE TIME ESTIMATE

OPERATION	TIME ESTIMATE (DAYS)
IMMEDIATE RESPONSE • safeguard personnel, render first-aid • make initial notifications • implement short term intervention (if possible) • implement spill control • develop Initial Action Plan	1
INTERIM RESPONSE • establish Onsite Command Center and Emergency Management Team • assess well control issues • mobilize people and equipment (Helix DW Containment System) • implement short term intervention and containment (if possible) • develop Intervention Plan • initiate relief well planning • continue spill control measures	4
INTERVENTION AND CONTAINMENT OPERATIONS • mobilize equipment and initiate intervention and containment operations • perform TA operations and mobilize relief wells rig(s) • finalize relief well plans, mobilize spud equipment, receive approvals • continue spill control measures	14
RELIEF WELL(S) OPERATIONS • continue intervention and containment measures • continue spill control measures • drill relief well (s)	45
PERFORM HYDRAULIC KILL OPERATIONS / SECURE BLOWNOUT WELL • continue intervention and containment measures • continue spill control measures • perform hydraulic kill operations, monitor well, secure well	14
ESTIMATED TOTAL DAYS OF UNCONTROLLED FLOW	78
SECURE RELIEF WELL(S) / PERFORM P&A / TA OPERATIONS / DEMOBE	30
TOTAL DAYS	108

APPENDIX C
GEOLOGICAL AND GEOPHYSICAL INFORMATION
(30 CFR PART 550.214 AND 550.244)

A. *Geological Description*

Included as *Attachment C-1* are the geological targets and a narrative of trapping features proposed in this Plan.

B. *Structure Contour Maps*

Included in *Attachment C-2* are current structure maps (depth base and expressed in feet subsea) depicting the entire lease coverage area; drawn on top of the prospective hydrocarbon sands. The maps depict each proposed bottom hole location and applicable geological cross section.

C. *Interpreted Seismic Lines*

The proposed surface disturbance operations will be conducted from a previously approved surface location as provided in the Supplemental DOCD for OCS-G-25098 Lease, Mississippi Canyon Block 546 (Control No. S-7659) approved on July 3, 2014 and Supplemental DOCD for OCS-G-25098 Lease, Mississippi Canyon 546 (Control No. S-7708) approved on February 2, 2015.
Attachment C-3.

D. *Geological Structure Cross-Sections*

The proposed surface disturbance operations will be conducted from a previously approved surface location as provided in the Supplemental DOCD for OCS-G-25098 Lease, Mississippi Canyon Block 546 (Control No. S-7659) approved on July 3, 2014 and Supplemental DOCD for OCS-G-25098 Lease, Mississippi Canyon 546 (Control No. S-7708) approved on February 2, 2015.
Attachment C-4.

E. *Shallow Hazards Report*

A supplement to Shallow Hazards Assessment / Bethic Communities Evaluation was prepared by Berger Geosciences, LLC dated August 15, 2014. A copy of this report was submitted to BOEM on September 18, 2014.

F Shallow Hazards Assessment

The proposed surface disturbance operations will be conducted from a previously approved surface location as provided in the Supplemental DOCD for OCS-G-25098 Lease, Mississippi Canyon Block 546 (Control No. S-7659) approved on July 3, 2014 and Supplemental DOCD for OCS-G-25098 Lease, Mississippi Canyon 546 (Control No. S-7708) approved on February 2, 2015, therefore, no Shallow Hazards Assessment is required for the proposed activity. Gardline Surveys Inc. conducted a 3D geophysical survey of MC 503 during Oct. 2005. to evaluate geologic conditions and inspect for potential hazards or constraints to lease development. Copies of these reports have been submitted to the BOEMRE under separate cover. A complete archaeological assessment based on both data sets was prepared by Tesla Offshore and submitted under the Revised Exploration Plan (R-5139) which was approved by BOEM on October 6, 2011.

G. High Resolution Seismic Lines

The proposed surface disturbance operations will be conducted from a previously approved surface location as provided in the Supplemental DOCD for OCS-G-25098 Lease, Mississippi Canyon Block 546 (Control No. S-7659) approved on July 3, 2014 and Supplemental DOCD for OCS-G-25098 Lease, Mississippi Canyon 546 (Control No. S-7708) approved on February 2, 2015.

H. Stratigraphic Column

A generalized bio stratigraphic/lithostratigraphic column from the seafloor to the total depth of the proposed wells is included as *Attachment C-5*.

I. Time vs Depth Tables

LLOG has determined that there is existing sufficient well control data for the target areas proposed in this Plan; therefore, tables providing seismic time versus depth for the proposed well locations are not required.

Geologic Description

Attachment C-1

(Proprietary Information)

Structure Contour Maps

Attachment C-2

(Proprietary Information)

Interpreted Seismic Lines

Attachment C-3

(Proprietary Information)

Geological Cross Sections

Attachment C-4

(Proprietary Information)

Stratigraphic Column

Attachment C-5

(Proprietary Information)

APPENDIX D
HYDROGEN SULFIDE (H₂S) INFORMATION
(30 CFR PART 550.215 AND 550.245)

A. Concentration

LLOG does not anticipate encountering H₂S while conducting the proposed development operations provided under this plan.

B. Classification

As per BOEM's letter dated August 1, 2023, the area in which the proposed drilling operations are to be conducted is hereby classified, in accordance with 30 CFR 250.490(c), as "H₂S absent."

C. H₂S Contingency Plan

The field has been classified as H₂S absent.

D. Modeling Report

The field has been classified as H₂S absent.

APPENDIX E
MINERAL RESOURCE CONSERVATION INFORMATION
(30 CFR PART 550.246)

A. *Technology and Reservoir Engineering Practices and Procedures*

LLOG plans to complete the well as a dual zone SMART well if there are two zones with commercial hydrocarbon quantities. The MC 546 007 well will pass through the

Frac Pack technology will be implemented to reduce skin damage and promote an economic rate without a significant drawdown across the near wellbore region. Frac Packs have been proven to reduce water coning, allowing improved oil recovery in sensitive reservoirs. Frac Packs have also been proven to minimize the loss of productivity due to compactive permeability loss near the wellbore in high compressibility silica-clastic reservoirs.

Water injection is not necessary. LLOG believes there is plenty of reservoir pressure and aquifer support in the two reservoirs.

B. *Technology and Recovery Practices and Procedures*

The monitoring of downhole flowing and static pressure measurements will provide a tool to evaluate the optimum recovery process.

This monitoring of pressure, temperature, and rate measurements in real time will provide a tool to measure productivity index continuously, identify problem or changing well performance, and give a clear picture of reservoir energy with time. Pressure transient analysis will be run as needed in the event flow characteristics change. Interpretation of downhole data will be used to guide reservoir management to minimize compactive permeability loss where possible.

C. Reservoir Development

The Mc 546 007 is expected to spud in April, 2027. This well is planned to be drilled from “G” subsea location and a new jumper will be added with flow and sand detection. During the course of drilling the subject well the following suite of logs and surveys are expected:

<i>Service Company</i>	<i>Log Type or Survey</i>
Baker Hughes Inteq	Multiple Propagation Resistivity-Density-Neutron-Acoustic-GR on LWD (and Directional Surveys), FPWD

The G-5 well is expected to find the following sands productive:

<i>Reservoir</i>	<i>Hydrocarbon</i>	<i>Net Pay, TVT</i>	<i>Porosity</i>	<i>Water Saturation</i>

When drilling is complete, LLOG plans to TA the well and evaluate best completion path forward.

APPENDIX F
BIOLOGICAL, PHYSICAL AND SOCIOECONOMIC
INFORMATION
(30 CFR Part 550.216 and 550.247)

A. High-Density Deepwater Benthic Communities Information

Features or areas that could support high density sensitive sessile benthic communities are *not* located within 2,000' of the proposed locations.

B. Topographic Features Map

The activities proposed in this Plan are not affected by a topographic feature.

C. Topographic Features Statement (Shunting)

The activities proposed in this Plan are not affected by a topographic feature.

D. Live Bottoms (Pinnacle Trend) Map

Mississippi Canyon Blocks 546 is not located within the vicinity of a proposed live bottom (low relief) area.

E. Live Bottoms (Low Relief) Map

Mississippi Canyon Blocks 546 is not located within the vicinity of a proposed live bottom (Low Relief) area.

F. Potentially Sensitive Biological Features Map

Mississippi Canyon Block 546 is not located within the vicinity of a proposed sensitive biological feature area.

G. Threatened or Endangered Species, Critical Habitat, and Marine Mammal Information.

Proposed activities in Mississippi Canyon Block 546 are not located in a critical habitat designated under ESA and marine mammals protected under the MMPA although federally protected marine mammals are always anticipated. In the event federally listed species are encountered on Mississippi Canyon Block 546, LLOG will mitigate impact through compliance with BOEM NTL 2016-G01, G02, NTL 2015 BSEE-G03 and the Biological Opinion of the Endangered Species Act Section 7. See Attachment F-1 for a list of the NOAA Species known in the Gulf of Mexico. Moon pool daily observation log shall be maintained on the bridge. The deck supervisor on tour shall go to the bridge and log time, date, and results of each moon pool inspection. STOP WORK AUTHORITY shall be used and implemented, in a safe and timely manner, for any work that could affect marine life listed on the Endangered Species Act.

Attachment F-1 for a list of the NOAA Species known in the Gulf of Mexico

H. Archaeological Report

An Archaeological, Engineering and Hazard report Assessment Report has been prepared by C&C Technologies Survey Services dated August, 2014. A copy of this report was submitted to BOEM on September 18, 2014.

I. Air and Water Quality Information

Not applicable to proposed operations.

J. Socioeconomic Information

Not applicable to proposed operations.

NOAA Species Known in GOM

Attachment F-1 (Public Information)

Endangered Species List Common to the Gulf of Mexico

Geophysical surveys, including the use of airguns and airgun arrays, may have an impact on marine wildlife. Many marine species are protected under the Endangered Species Act (ESA) and all marine mammals (including manatees) are protected under the Marine Mammal Protection Act (MMPA). The following Gulf of Mexico species are listed under the ESA:

Gulf of Mexico Bryde's Whale (<i>Balaenoptera edeni</i>)
Sperm Whale (<i>Physeter macrocephalus</i>)
Green Turtle (<i>Chelonia mydas</i>) – North Atlantic DPS and South Atlantic DPS
Hawksbill Turtle (<i>Eretmochelys imbricata</i>)
Kemp's Ridley Turtle (<i>Lepidochelys kempii</i>)
Leatherback Turtle (<i>Dermochelys coriacea</i>) - Northwest Atlantic
Loggerhead Turtle (<i>Caretta caretta</i>) – Northwest Atlantic Ocean DPS
Gulf Sturgeon (<i>Acipenser oxyrinchus desotoi</i>)
Oceanic Whitetip Shark (<i>Carcharhinus longimanus</i>)
Giant Manta Ray (<i>Manta birostris</i>)
West Indian Manatee (<i>Trichechus manatus</i>)*

Note that this list can change as other species are listed/delisted, and this protocol shall be applied to any ESA protected species (and all marine mammals) that occur in the Gulf of Mexico, including rare and extralimital species.

LLOG's proposed operations in this plan will not impact the critical habitats of the marine species listed in the Endangered Species Act.

*Managed by the US Fish and Wildlife Service

APPENDIX G
WASTE AND DISCHARGE INFORMATION
(30 CFR PART 550.217 AND 550.248)

A. Projected Generated Wastes

See the following tables:

**TABLE 1. Waste Generated, Treated and Downhole Dispose or
Discharge to the GOM - See Attached**

**TABLE 2. Waste Transported and / or Disposed of Onshore –
See Attached**

B. Modeling

Not applicable. Proposed activities will be covered by U.S. EPA NPDES General Permit.

**TABLE 1. WASTES YOU WILL GENERATE, TREAT AND DOWNHOLE DISPOSE OR
DISPOSE OR DISCHARGE IN THE GOM**

please specify if the amount reported is a total or per well amount

MC 546 - WHO DAT

Projected generated waste			Projected ocean discharges		Downhole Disposal
Type of Waste	Composition	Projected Amount	Discharge rate	Discharge Method	Answer yes or no
Will drilling occur ? If yes, fill in the muds and cuttings.					
EXAMPLE: Cuttings wetted with synthetic based fluid	Cuttings generated while using synthetic based drilling fluid.	X bbl/well	X bbl/day/well	discharge overboard	No
Water-based drilling fluid	Water based mud additives, barite and gel used for WBM	88,839 bbls/well	5,730 bbls/day/well	Discharge overboard	No
Cuttings wetted with water-based fluid	Cuttings generated while using water based drilling fluid.	4,896 bbls/well	316 bbls/day/well	Discharge overboard	No
Cuttings wetted with synthetic-based fluid	Cuttings generated while using synthetic based drilling fluid.	2,097 bbls/well	178 bbls/day/well	Discharge overboard	No
Will humans be there? If yes, expect conventional waste					
EXAMPLE: Sanitary waste water	Sanitary waste from living quarters	X bbl/well	X bbl/hr/well	chlorinate and discharge overboard	No
Domestic waste	Misc waste for living quarters	5,932 bbls/well	3.1 bbls/hr/well	Discharge overboard (no free oil)	No
Sanitary waste	Processed sanitary waste from living quarters	3,955 bbls/well	2.1 bbls/hr/well	Chlorinate and discharge overboard	No
Is there a deck? If yes, there will be Deck Drainage					
Deck Drainage	Accumulated drainage due to rainfall	0 to 47,261 bbls/well	0 to 167 bbls/hr/well	Test for oil and grease and discharge overboard	No
Will you conduct well treatment, completion, or workover?					
Well treatment fluids	NPDES approved treatment fluid used for well operations	100 bbls/well	20 bbls/hr/well	Test for oil and grease and discharge overboard.	No
Well completion fluids	Clear brines used for completion operations	500 bbls/well	100 bbls/hr/well	Test for oil and grease and discharge overboard. This excludes clear brines containing Zinc	No
Workover fluids	N/A	N/A	NA	NA	No
Miscellaneous discharges. If yes, only fill in those associated with your activity.					
Desalinization unit discharge	N/A	N/A	N/A	N/A	N/A
Blowout prevent fluid	N/A	N/A	N/A	N/A	N/A
Ballast water	Uncontaminated seawater used for ballast control	0 to 100,000 bbls/well	16,350 bbls/hr/well	Discharge overboard	No
Bilge water	N/A	N/A	N/A	N/A	N/A
Excess cement at seafloor	Excess cement slurry and mixwater used for cementing operation - NPDES allowed	300 bbls/well	360 bbls/hr/well	Discharge at mudline	No
Fire water	Uncontaminated seawater used for fire control system	0 to 10,000 bbls/well	16,350 bbls/hr/well	Discharge overboard	No
Cooling water	N/A	N/A	N/A	N/A	N/A
Will you produce hydrocarbons? If yes fill in for produced water.					
Produced water	NA	NA	NA	NA	N/A
Will you be covered by an individual or general NPDES permit ?					
NOTE: If you will not have a type of waste, enter NA in the row.			GMG 290180 comply with the requirements of the NPDES permit.		

TABLE 2. WASTES YOU WILL TRANSPORT AND /OR DISPOSE OF ONSHORE						
Please specify whatever the amount reported is a total or per well						
MC 546		Projected generated waste	Solid and Liquid Wastes Transportation	Waste Disposal		
Type of Waste	Composition	Transport Method	Name/Location of Facility	Amount	Disposal Method	
			Newport Environmental Services Inc., Ingleside, TX	X bbl/well	Recycled	
Oil-based drilling fluid or mud	N/A	NA	N/A	NA	NA	
Synthetic-based drilling fluid or mud	Internal olifin, ester nbased mud	Barged in 25 bbls cutting boxes and / or liquid mud tanks for supply vessels	Newpark Transfer Station, Fourchon, LA	6750 bbls / well	Recycled	
Cuttings wetted with Water-based fluid	N/A	NA	N/A	NA	NA	
Cuttings wetted with Synthetic-based fluid	N/A	NA	N/A	NA	NA	
Cuttings wetted with oil-based fluids	N/A	NA	N/A	NA	NA	
Will you produce hydrocarbons? If yes fill in for produced sand.						
Produced sand						
Will you have additional wastes that are not permitted for discharge? If						
EXAMPLE: trash and debris (recyclables)	Plastic, paper, aluminum	barged in a storage bin	ARC, New Iberia, LA	X lb/well	Recycled	
Trash and debris	Plastic, paper, aluminum	Barged in a storage bin	Blanchard Landfill, Golden Meadows, LA	4000 lbs / well	Recycled	
Used oil	Spent oil from machinery	Barged in USCG approved transfer tote tanks.	L&L Services, Fourchon, LA	200 bbls / well	Recycled	
Wash water	Wash water w/ SBM residue and surfactants	Barged in 25 bbls cutting boxes and / or liquid mud tanks for supply vessels	Newpark Transfer Station, Fourchon, LA	2000 bbls / well	Approved disposal well injection or land farm	
Chemical product wastes	Spent treatment and / or damaged chemicals used in operations	Barged in 25 bbls cutting boxes and / or cutting boxes	L&L Services, Fourchon, LA	10 bbls / well	Recycled	
NOTE: If you will not have a type of waste, enter NA in the row.						

APPENDIX H
AIR EMISSIONS INFORMATION
(30 CFR PART 550.218 AND 550.249)

The primary air pollutants associated with OCS development activities are:

- Carbon Monoxide
- Particulate Matter
- Sulphur Oxides
- Nitrogen Oxides
- Volatile Organic Compounds

These offshore air emissions result mainly from the drilling rig operations, helicopters, and support vessels. These emissions occur mainly from combustion or burning of fuels and natural gas and from venting or evaporation of hydrocarbons. The combustion of fuels occurs primarily on diesel powered generators, pumps or motors and from lighter fuel motors. Other air emissions can result from catastrophic events such as oil spills and blowouts.

A. Emission Worksheets and Screening Questions

The Projected Air Quality Emissions Report (Form BOEM-139) addresses the related support vessels and construction barge information.

B. Emissions Reduction Measures

The projected air emissions are within the exemption level; therefore, no emission reduction measures are being proposed.

C. Verification of Non-default Emissions Factors

LLOG has elected to use the default emission factors as provided in *Attachment H-1*

D. Non-Exempt Activities

The proposed activities are within the exemption amount.

E. Modeling Report

Not applicable. The State of Florida is not an affected State for the proposed activities in this plan.

Air Quality Emissions Report

Attachment H-1 (Public Information)

Attachment H-1

Air Emissions Information (§§ 550.218 and 550.249)

Screening Questions for DOCD's	Yes	No
Is any calculated Complex Total (CT) Emission amount (tons) associated with your proposed development and production activities more than 90% of the amounts calculated using the following formulas: $CT = 3400D^{2/3}$ for CO, and $CT = 33.3D$ for the other air pollutants (where D = distance to shore in miles)?		X
Do your emission calculations include any emission reduction measures or modified emission factors?		X
Does or will the facility complex associated with your proposed development and production activities process production from eight or more wells?		X
Do you expect to encounter H ₂ S at concentrations greater than 20 parts per million (ppm)?		X
Do you propose to flare or vent natural gas in excess of the criteria set forth under 30 CFR 250.1105(a)(2) and (3)?		X
Do you propose to burn produced hydrocarbon liquids?		X
Are your proposed development and production activities located within 25 miles (40 kilometers) from shore?		X
Are your proposed development and production activities located within 124 miles (200 kilometers) of the Breton Wilderness Area?	X	

The air emissions for this plan were calculated using fuel estimates based on actual fuel use for a drillship and DP semi-submersible. Sample fuel usage documents from each type of vessel are attached.

COMPANY	LLOG Exploration Offshore, L.L.C.
AREA	Mississippi Canyon
BLOCK	546 / 503
LEASE	OCS-G-25098 & OCS-G-27277
FACILITY	Who Dat
WELL	MC 546 SS007
COMPANY CONTACT	Susan Sachitana
TELEPHONE NO.	985-801-4300
REMARKS	Drillship - Drilling & Completion Operations

LEASE TERM PIPELINE CONSTRUCTION INFORMATION:		
YEAR	NUMBER OF PIPELINES	TOTAL NUMBER OF CONSTRUCTION DAYS
2026		
2027	4	30
2028		
2029		
2030		
2031		
2032		
2033		
2034		
2035		

*Actual Fuel was used in the calculations of these emissions based on historical use of vessels.

AIR EMISSIONS COMPUTATION FACTORS

Fuel Usage Conversion Factors		Natural Gas Turbines			Natural Gas Engines			Diesel Recip. Engine		Diesel Turbines		DATE	Reference Links
		SCF/hp-hr	9.524		SCF/hp-hr	7.143	GAL/hp-hr	0.0514	GAL/hp-hr	0.0514			
Equipment/Emission Factors	units	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	REF.		
Natural Gas Turbine	g/hp-hr		0.0086	0.0086	0.0026	1.4515	0.0095	0.3719	N/A		AP42 3.1-13.3.1-2a	4/93	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a01.pdf
RECIP. 2 Cycle Lean Natural Gas	g/hp-hr		0.1293	0.1293	0.0020	6.5995	0.4052	N/A	1.2009	N/A	AP42 3.2-1	7/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a02.pdf
RECIP. 4 Cycle Lean Natural Gas	g/hp-hr		0.0002	0.0002	0.0020	2.8814	0.4014	N/A	1.8949	N/A	AP42 3.2-2	7/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a02.pdf
RECIP. 4 Cycle Rich Natural Gas	g/hp-hr		0.0323	0.0323	0.0020	7.7224	0.1021	N/A	11.9408	N/A	AP42 3.2-3	7/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a02.pdf
Diesel Recip. < 600 hp	g/hp-hr	1	1	1	0.0279	14.1	1.04	N/A	3.03	N/A	AP42 3.3-1	10/96	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a03.pdf
Diesel Recip. > 600 hp	g/hp-hr	0.32	0.182	0.178	0.0055	10.9	0.29	N/A	2.5	N/A	AP42 3.4-1 & 3.4-2	10/96	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a04.pdf
Diesel Boiler	lbs/bbl	0.0840	0.0420	0.0105	0.0089	1.0080	0.0084	5.14E-05	0.2100	0.0336	AP42 1.3-6: Pb and NH3: Wet/FIRE (08/2018)	9/98 and 5/10	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a05.pdf
Diesel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0013	4.45E-05	0.0105	N/A	AP42 3.1-1 & 3.1-2a	4/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a01.pdf
Dual Fuel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0095	4.45E-05	0.3719	0.0000	AP42 3.1-1 & 3.1-2a; AP42 3.1-1 & 3.1-2a	4/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a01.pdf
Vessels – Propulsion	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI/TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nel-04a
Vessels – Drilling Prime Engine, Auxiliary	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI/TSP refer to Diesel Recip. > 600 hp reference	3/19	
Vessels – Diesel Boiler	g/hp-hr	0.0466	0.1491	0.1417	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI/TSP (units converted) refer to Diesel Boiler Reference	3/19	
Vessels – Well Stimulation	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI/TSP refer to Diesel Recip. > 600 hp reference	3/19	
Natural Gas Heater/Boiler/Burner	lbs/MMscf	7.60	1.90	1.90	0.60	190.00	5.50	5.00E-04	84.00	3.2	AP42 1.4-1 & 1.4-2: Pb and NH3: Wet/FIRE (08/2018)	7/98 and 5/10	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a06.pdf
Combustion Flare (no smoke)	lbs/MMscf	0.00	0.00	0.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (light smoke)	lbs/MMscf	2.10	2.10	2.10	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (medium smoke)	lbs/MMscf	10.50	10.50	10.50	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	https://www3.epa.gov/ttnchie1/ap42/ch03/final/C13505_02-05-18.pdf
Combustion Flare (heavy smoke)	lbs/MMscf	21.00	21.00	21.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Liquid Flaring	lbs/bbl	0.42	0.0965	0.0651	5.964	0.84	0.01428	5.14E-05	0.21	0.0336	AP42 1.3-1 through 1.3-3 and 1.3-5	5/10	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01a03.pdf
Storage Tank	tons/yr/tank						4.300				2014 Gulfwide Inventory: Ag. ems (upper bound of 95% CI)	2017	https://www.boem.gov/boem/environmental-studies/2014-gulfwide-emission-inventory
Fugitives	lbs/hr/component						0.0005				API Study	12/93	https://www.epa.gov/air-emissions-inventories/2014-gulfwide-emission-inventory
Glycol Dehydrator	tons/yr/dehydrator						19.240				2011 Gulfwide Inventory: Ag. ems (upper bound of 95% CI)	2014	https://www.boem.gov/boem/environmental-studies/2014-gulfwide-emission-inventory
Cold Vent	tons/yr/vent						44.747				2014 Gulfwide Inventory: Ag. ems (upper bound of 95% CI)	2017	https://www.boem.gov/boem/environmental-studies/2014-gulfwide-emission-inventory
Waste Incinerator	lb/ton		15.0	15.0	2.5	2.0	N/A	N/A	20.0	N/A	AP 42 2.1-12	10/96	https://www3.epa.gov/ttnchie1/ap42/ch02/final/c02a01.pdf
On-ice – Loader	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice – Other Construction Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice – Other Survey Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice – Tractor	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice – Truck (for gravel island)	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice – Truck (for surveys)	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
Man Camp – Operation (max people/day)	tons/person/day		0.0004	0.0004	0.0004	0.006	0.001	N/A	0.001	N/A	BOEM 2014-1001	2014	https://www.boem.gov/sites/default/files/uploaded/Files/BOEM/BOEM_Newsroom/Library/Publications/2014-1001-1.pdf
Vessels – Ice Management Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI/TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nel-04a
Vessels – Hovcraft Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI/TSP refer to Diesel Recip. > 600 hp reference	3/19	

Sulfur Content Source	Value	Units
Fuel Gas	3.36	ppm
Diesel Fuel	0.0015	% weight
Produced Gas (Flare)	3.36	ppm
Produced Oil (Liquid Flaring)	1	% weight

Natural Gas Flare Parameters	Value	Units
VOC Content of Flare Gas	0.8816	lb VOC/lb-mol gas
Natural Gas Flare Efficiency	98	%

Density and Heat Value of Diesel Fuel	
Density	7.05 lbs/gal
Heat Value	19,300 Btu/lb

Heat Value of Natural Gas	
Heat Value	1,050 MMBtu/MMscf

AIR EMISSIONS CALCULATIONS - 1ST YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL				CONTACT	PHONE	REMARKS														
OPERATIONS	Equipment Codes		HP	MAX. FUEL	ACT. FUEL	RUN TIME																			
	Equipment	EQUIPMENT ID	BAYING	MAX. FUEL	ACT. FUEL	RUN TIME																			
	Diesel Engines	HP	SCF/HR	SCF/D																					
	Net Gas Engines	MMBTU/HR	SCF/HR	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SO _x	NO _x														
	Burners						VOC	Pb	CO	NH ₃	TSP	PM10	PM2.5	SO _x	NO _x	VOC	Pb	CO	NH ₃						
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Drilling Prime Engine, Auxiliary	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
PIPELINE	VESSELS - Pipeline Laying Vessel - Diesel	12000	617.352	14816.43	24	30	8.47	5.11	4.95	0.12	202.83	5.83	0.00	31.81	0.06	3.05	1.84	1.78	0.04	73.02	2.10	0.00	11.45	0.02	
INSTALLATION	VESSELS - ROV vessel	8000	411.588	9877.63	24	30	5.64	3.41	3.30	0.08	135.22	3.88	0.00	21.21	0.04	2.03	1.23	1.15	0.03	48.68	1.40	0.00	7.64	0.01	
FACILITY INSTALLATION	VESSELS - Heavy Lift Vessel/Service Barge Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
PRODUCTION	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	VESSELS - Shuttle Tankers	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Well Stimulation	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Natural Gas Turbine	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	Diesel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Dual Fuel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	RECIP - 2 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	RECIP - 4 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	RECIP - 4 Cycle Rich Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Natural Gas Heater/Boiler/Burner	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
MISC.		BPD	SCF/HR	COUNT																					
	STORAGE TANK	162500	0	1	1							0.00	--	52.88	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--	
	COMBUSTION FLARE - no smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - light smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - medium smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COLD VENT	0	1	1								0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	FUGITIVES	0	0	0								0.00	--	0.00	--	--	--	--	--	--	--	--	0.00	--	
	GLYCOL DEHYDRATOR	0	0	1	1							0.00	--	0.00	--	--	--	--	--	--	--	--	0.00	--	
	WASTE INCINERATOR	0	0	0								0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
DRILLING	Liquid Flaring	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
WELL TEST	COMBUSTION FLARE - no smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - light smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - medium smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
ALASKA-SPECIFIC SOURCES	VESSELS	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
	VESSELS - Ice Management Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
2026 Facility Total Emissions							87.28	34.86	33.52	0.93	1,384.10	46.30	0.00	268.17	0.40	21.84	12.99	12.60	0.32	616.94	16.33	0.00	86.37	0.16	
EXEMPTION	DISTANCE FROM LAND IN MILES															1,263.40		1,265.40	1,265.40	1,265.40			38,429.79		
CALCULATION	3E-0																								
DRILLING	VESSELS - Crew Diesel	7200	370.4112	8889.87	12	51	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.57	0.95	0.92	0.02	37.56	1.08	0.00	5.86	0.01	
	VESSELS - Supply Diesel	7200	370.4112	8889.87	12	103	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	3.13	1.89	1.83	0.05	75.11	2.16	0.00	11.78	0.02	
	VESSELS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PIPELINE	VESSELS - Support Diesel, Laying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
INSTALLATION	VESSELS - Support Diesel, Burying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
FACILITY	VESSELS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
INSTALLATION	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PRODUCTION	VESSELS - Support Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ALASKA-SPECIFIC SOURCES	On-Ice Equipment																								
	Man Camp - Operation (maximum people per day)		PEOPLE/DAY																						
	VESSELS		NW			HR/D	D/YR																		
	On-Ice - Loader	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
	On-Ice - Other Construction Equipment	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
	On-Ice - Other Survey Equipment	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
	On-Ice - Tractor	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
	On-Ice - Truck (for gravel island)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
	On-Ice - Truck (for surveys)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
	Man Camp - Operation	0	0	0	0	0	0.00	0.00	0.00	0.0															

AIR EMISSIONS CALCULATIONS - 2ND YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL				CONTACT	PHONE	REMARKS													
OPERATIONS	EQUIPMENT	EQUIPMENT ID	BAYING	MAX. FUEL	ACT. FUEL	RUN TIME																		
	Diesel Engines	HP	GAL/HR	GAL/D																				
	Net Gas Engines	MMBTU/HR	SCF/HR	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SO _x	NO _x	VOC	Pb	CO	NO ₂	TSP	PM10	PM2.5	SO _x	NO _x	VOC	Pb	CO	NO ₂
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling Prime Engine, Auxiliary	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PIPELINE	VESSELS - Pipeline Laying Vessel - Diesel	12000	617.352	14816.43	24	30	8.47	5.11	4.95	0.12	202.83	5.83	0.00	31.81	0.06	3.05	1.84	1.78	0.04	73.02	2.10	0.00	11.45	0.02
INSTALLATION	VESSELS - Pipeline Burying - Diesel	8000	411.588	9877.63	24	30	5.64	3.41	3.30	0.08	135.22	3.88	0.00	21.21	0.04	2.03	1.23	1.15	0.03	48.68	1.40	0.00	7.64	0.01
FACILITY INSTALLATION	VESSELS - Heavy Lift Vessel/Service Barge Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	VESSELS - Shuttle Tankers	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Well Stimulation	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Natural Gas Turbine	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	Diesel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dual Fuel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RECIP - 2 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 4 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 4 Cycle Rich Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Natural Gas Heater/Boiler/Burner	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MISC.		BPD	SCF/HR	COUNT																				
STORAGE TANK	COMBUSTION FLARE - no smoke	162500	0	1	1							0.00	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--
	COMBUSTION FLARE - light smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - medium smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COLD VENT	0	1	1								0.00	--	--	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	FUGITIVES	0	0	0								0.00	--	--	--	--	--	--	--	--	--	--	--	--
	GLYCOL DEHYDRATOR	0	0	1	1							0.00	--	--	--	--	--	--	--	--	--	--	--	--
	WASTE INCINERATOR	0	0	0								0.00	0.00	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	Liquid Flaring	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	COMBUSTION FLARE - no smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
WELL TEST	COMBUSTION FLARE - light smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - medium smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
ALASKA-SPECIFIC SOURCES	VESSELS	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	VESSELS - Ice Management Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
2027	Facility Total Emissions						87.28	34.86	33.52	0.93	1,384.10	46.30	0.00	268.17	0.40	21.84	12.99	12.60	0.32	616.94	16.33	0.00	86.37	0.16
EXEMPTION	DISTANCE FROM LAND IN MILES															1,263.40		1,265.40	1,265.40	1,265.40				38,429.79
CALCULATION	3E-3																							
DRILLING	VESSELS - Crew Diesel	7200	370.4112	8889.87	12	51	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.57	0.95	0.92	0.02	37.56	1.08	0.00	5.86	0.01
	VESSELS - Supply Diesel	7200	370.4112	8889.87	12	103	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	3.13	1.89	1.83	0.05	75.11	2.16	0.00	11.78	0.02
	VESSELS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Support Diesel, Laying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PIPELINE INSTALLATION	VESSELS - Support Diesel, Burying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Support Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Support Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	On-Ice Equipment			GAL/HR	GAL/D																			
	Man Camp - Operation (maximum people per day)			PEOPLE/DAY																				
	VESSELS			NW		HR/D	D/YR																	
	On-Ice - Loader	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice - Other Construction Equipment	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice - Other Survey Equipment	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice - Tractor	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice - Truck (for gravel island)	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0						

AIR EMISSIONS CALCULATIONS - 3RD YEAR

[illegible]

AIR EMISSIONS CALCULATIONS - 4TH YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL				CONTACT	PHONE	REMARKS					
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RAYING	MAX. FUEL	ACT. FUEL	RUN TIME				MAXIMUM POUNDS PER HOUR	ESTIMATED TONS					
		Diesel Engines		HP	SCF/HR	SCF/D												
		Nat. Gas Engines		MMBTU/HR	SCF/HR	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SO _x	NO _x	VOC	Pb	CO	NO ₂	
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel	0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
VESSELS - Drilling - Propulsion Engine - Diesel		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
VESSELS - Diesel Boiler		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
VESSELS - Drilling Prime Engine, Auxiliary		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PIPELINE INSTALLATION		VESSELS - Pipeline Laying Vessel - Diesel		12000	617,352	14816.43	24	0	8.47	5.11	4.95	0.12	202.83	5.83	0.00	31.81	0.06	
		VESSELS - Pipeline Burying - Diesel		8000	411,568	9877.63	24	0	5.64	3.41	3.30	0.08	135.22	3.88	0.00	21.21	0.04	
FACILITY INSTALLATION		VESSELS - Heavy Lift Vessel/Service Barge Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PRODUCTION	RECIP - 600hp Diesel	0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
MISC.		BPD		SCF/HR	COUNT													
DRILLING	STORAGE TANK	162500		0	1	1	0	1	0.00	0.00	0.00	0.09	11.80	5.84	--	52.89	--	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	
WELL TEST	COMBUSTION FLARE - no smoke	0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ALASKA-SPECIFIC SOURCES	VESSELS - Ice Management Diesel	0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
2020 Facility Total Emissions									87.28	34.86	33.52	0.93	1,384.10	46.30	0.00	268.17	0.40	
EXEMPTION CALCULATION		DISTANCE FROM LAND IN MILES																
		38.0																
DRILLING	VESSELS - Crew Diesel	7200		370,411.2	8889.87	12	51	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.57	
		7200		370,411.2	8889.87	12	103	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	3.13	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PIPELINE INSTALLATION	VESSELS - Support Diesel, Laying	0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
FACILITY	VESSELS - Crew Diesel	0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PRODUCTION	VESSELS - Supply Diesel	0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ALASKA-SPECIFIC SOURCES	On-Ice Equipment	Man Camp - Operation (maximum people per day)			PEOPLE/DAY													
		VESSELS			0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
		On-Ice - Ladder			0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
		On-Ice - Other Construction Equipment			0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
2020 Non-Facility Total Emissions		On-Ice - Other Survey Equipment			0	0												

AIR EMISSIONS CALCULATIONS - 5TH YEAR

COMPANY		BLOCK		LEASE		FACILITY		WELL		CONTACT		PHONE		REMARKS																	
OPERATIONS		MAX FUEL		MAX FUEL		MAX FUEL		MAX FUEL		MAX FUEL		MAX FUEL		Drilling, Production & Completion Operations																	
EQUIPMENT		EQUIPMENT ID		RATING		MAX FUEL		MAX FUEL		MAX FUEL		MAX FUEL		ESTIMATED TONS																	
Diesel Engines		HP		SCF/NR		GAL/NR		GAL/D		GAL/D		GAL/D																			
Net Gas Engines		HP		SCF/NR		GAL/NR		GAL/D		GAL/D		GAL/D																			
Burners		MMBTU/Hr		SCF/NR		HRD		DYR		TSP		PM10		PM2.5		SOx		NOx		VOC		Pb		CO		NH3					
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	Vesicles - Diesel Borel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
	Vesicles - Drilling Prime Engine, Auxiliary	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
PIPELINE	VESSELS - Pipeline Laying Vessel - Diesel	12000	617,392	14816.45	24	0	8.67	5.11	4.96	0.12	202.83	5.83	0.00	31.81	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
INSTALLATION	VESSELS - Pipeline Burying - Diesel	8800	411,568	9877.63	24	0	8.64	3.41	3.30	0.06	155.22	3.88	0.00	31.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
FACILITY INSTALLATION	VESSELS - Heavy Lift Vessel/Derrick Barge Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
PRODUCTION	RECIP-6000psi Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	RECIP-4000psi Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	VESSELS - Shuttle Tankers	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	VESSELS - Well Stimulation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Natural Gas Turbine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Direct Turbine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Quid Fuel Turbine	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	RECIP-2 Cycle Lean Natural Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	RECIP-4 Cycle Lean Natural Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	RECIP-4 Cycle Rich Natural Gas	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Diesel Borel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Natural Gas Heater/Borel/Burner	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	MISC	BPD	SCF/NR	COUNT																											
STORAGE TANK	COMBUSTION FLARE - no smoke	162500	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	COMBUSTION FLARE - light smoke	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	COMBUSTION FLARE - medium smoke	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	COLD VENT	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	FLUIDS	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	GLYCOL DEHYDRATOR	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	WASTE INCINERATOR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
DRILLING	Liquid Flaring	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
WELL TEST	COMBUSTION FLARE - no smoke	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	COMBUSTION FLARE - light smoke	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	COMBUSTION FLARE - medium smoke	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
ALASKA-SPECIFIC SOURCES	VESSELS	MM			HRD	DYR																									
	VESSELS - Ice Management Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
2030	Facility Total Emissions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
EXEMPTION	DISTANCE FROM LAND IN MILES	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	30.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
DRILLING	VESSELS - Crew Diesel	7200	370,412	8889.87	12	51	3.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.57	0.95	0.92	0.02	37.55	1.08	0.59	0.69	0.01	0.00	0.00					
	VESSELS - Supply Diesel	7200	370,412	8889.87	12	103	0.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	3.13	1.89	1.83	0.05	75.11	2.16	0.00	11.78	0.02	0.00	0.00					
PIPELINE	VESSELS - Tugs Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
INSTALLATION	VESSELS - Support Diesel, Laying	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	VESSELS - Support Diesel, Burying	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	VESSELS - Crew Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	VESSELS - Support Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
FACILITY INSTALLATION	VESSELS - Material Tug Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	VESSELS - Crew Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	VESSELS - Supply Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
PRODUCTION	VESSELS - Support Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
ALASKA-SPECIFIC SOURCES	On-ice Equipment						GAL/NR	GAL/D																							
	Man Camp - Operation (maximum people per day)	PEOPLE/DAY																													
	VESSELS	MM			HRD	DYR																									
	On-ice - Loader	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	On-ice - Other Construction Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	On-ice - Other Survey Equipment	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	On-ice - Tractor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	On-ice - Truck (for gravel island)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	On-ice - Truck (for survey)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	Man Camp - Operation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
	VESSELS - Hovecraft Diesel	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
2030	Non-Facility Total Emissions	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0					

AIR EMISSIONS CALCULATIONS - 6TH YEAR

[illegible]

AIR EMISSIONS CALCULATIONS - 7TH YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL				CONTACT	PHONE	REMARKS
OPERATIONS	Equipment Codes		DATE	ACT. FUEL	MAX. FUEL	ACT. FUEL	MAX. FUEL	ACT. FUEL	DATE	ACT. FUEL	REMARKS
	EQUIPMENT	EQUIPMENT ID	BAYING	MAX. FUEL	ACT. FUEL	MAX. FUEL	ACT. FUEL	ACT. FUEL			
	Diesel Engines	HP	HP	SCFH	SCFH	SCFH	SCFH	SCFH			
	Net Gas Engines										
	Burners	MMBTU/HR	SCFH	SCFH	SCFH	SCFH	SCFH	SCFH			
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling Prime Engine, Auxiliary	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
PIPELINE	VESSELS - Pipeline Laying Vessel - Diesel	12000	617.352	14816.43	24	0	8.47	5.11	4.95	0.12	202.83
INSTALLATION	VESSELS - Pipeline Burying - Diesel	8000	411.588	9877.63	24	0	5.64	3.41	3.30	0.08	135.22
FACILITY INSTALLATION	VESSELS - Heavy Lift Vessel/Service Barge Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
PRODUCTION	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Shuttle Tankers	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Well Stimulation	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	Natural Gas Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	Diesel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	Dual Fuel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	RECIP - 2 Cycle Lean Natural Gas	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	RECIP - 4 Cycle Lean Natural Gas	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	RECIP - 4 Cycle Rich Natural Gas	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	Natural Gas Heater/Boiler/Burner	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
MISC.		BPD	SCFH	COUNT							
	STORAGE TANK	162500	0	0	0	0	0.00	0.00	0.00	0.09	11.80
	COMBUSTION FLARE - no smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	COMBUSTION FLARE - light smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	COMBUSTION FLARE - medium smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	COLD VENT	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	FUGITIVES	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	GLYCOL DEHYDRATOR	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	WASTE INCINERATOR	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
DRILLING	Liquid Flaring	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
WELL TEST	COMBUSTION FLARE - no smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	COMBUSTION FLARE - light smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	COMBUSTION FLARE - medium smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
ALASKA-SPECIFIC SOURCES	VESSELS	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Ice Management Diesel	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
2023	Facility Total Emissions						87.28	34.86	33.52	0.93	1,384.10
EXEMPTION	DISTANCE FROM LAND IN MILES										
CALCULATION	36.0										
DRILLING	VESSELS - Crew Diesel	7200	370.4112	8889.87	12	51	5.08	3.06	2.97	0.07	121.70
	VESSELS - Supply Diesel	7200	370.4112	8889.87	12	103	5.08	3.06	2.97	0.07	121.70
	VESSELS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
PIPELINE	VESSELS - Support Diesel, Laying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
INSTALLATION	VESSELS - Support Diesel, Burying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
FACILITY	VESSELS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
INSTALLATION	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
PRODUCTION	VESSELS - Support Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
ALASKA-SPECIFIC SOURCES	On-Ice Equipment										
	Man Camp - Operation (maximum people per day)										
	VESSELS										
	On-Ice - Lander	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	On-Ice - Other Construction Equipment	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	On-Ice - Other Survey Equipment	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	On-Ice - Tractor	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	On-Ice - Truck (for gravel island)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	On-Ice - Truck (for surveys)	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	Man Camp - Operation	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Hovercraft Diesel	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00
2023	Non-Facility Total Emissions						18.16	6.13	5.56	0.15	243.40

AIR EMISSIONS CALCULATIONS - 8TH YEAR

COMPANY		AREA		BLOCK	LEASE	FACILITY	WELL				CONTACT	PHONE	REMARKS														
OPERATIONS		EQUIPMENT		EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	RUN TIME				MAXIMUM POUNDS PER HOUR	ESTIMATED TONS														
		Diesel Engines		HP	MMBTU/HR	SCFH	SCFD	HR/D	D/YR	TSP	PM10	PM2.5	SOX	NOX	VOC	Pb	CO	NO2	TSP	PM10	PM2.5	SOX	NOX	VOC	Pb	CO	NO2
		Nat. Gas Engines		MMBTU/HR	SCFH	SCFD	HR/D	D/YR	TSP	PM10	PM2.5	SOX	NOX	VOC	Pb	CO	NO2	TSP	PM10	PM2.5	SOX	NOX	VOC	Pb	CO	NO2	
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Diesel Boiler			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VESSELS - Drilling Prime Engine, Auxiliary				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PIPELINE INSTALLATION				12000	617,352	14816.43	24	0	8.47	5.11	4.95	0.12	202.83	5.83	0.00	31.81	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VESSELS - Pipeline Burying - Diesel				8000	411,568	9877.63	24	0	5.64	3.41	3.30	0.08	135.22	3.88	0.00	21.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VESSELS - Heavy Lift Vessel/Service Barge Diesel				0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	RECIP - 600hp Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 600hp Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	VESSELS - Shuttle Tankers			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Well Stimulation			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Natural Gas Turbine			0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	Diesel Turbine			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dual Fuel Turbine			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RECIP - 2 Cycle Lean Natural Gas			0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 4 Cycle Lean Natural Gas			0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 4 Cycle Rich Natural Gas			0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	Diesel Boiler			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Natural Gas Heater/Boiler/Burner			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MISC.				BPD	SCFH	COUNT																					
DRILLING	STORAGE TANK			162500	0	1	1							0.00	--												
	COMBUSTION FLARE - no smoke			24	7	0.00	0.00	0.00	0.09	11.80	5.84	--	52.88	--	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--	--	--	--
	COMBUSTION FLARE - light smoke			0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	--	--
	COMBUSTION FLARE - medium smoke			0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	--	--
	COMBUSTION FLARE - heavy smoke			0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	--	--
	COLD VENT			0	1	1	1							0.00	--												
	FUGITIVES			0	0	0	--	--	--	--	--	--	--	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--
	GLYCOL DEHYDRATOR			0	1	1	1							0.00	--												
	WASTE INCINERATOR			0	0	0	--	--	--	--	--	--	--	0.00	--	--	--	--	--	--	--	--	--	--	--	--	--
	Liquid Flaring			0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	COMBUSTION FLARE - no smoke			0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - light smoke			0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - medium smoke			0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - heavy smoke			0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
ALASKA-SPECIFIC SOURCES				NW		HR/D	D/YR																				
VESSELS				0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
VESSELS - Ice Management Diesel				0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
2003 Facility Total Emissions									87.28	34.86	33.52	0.93	1,384.10	46.30	0.00	268.17	0.40	16.46	9.93	9.63	0.25	386.24	11.83	0.00	66.28	6.12	
EXEMPTION CALCULATION																			1,263.40		1,265.40	1,265.40				38,429.79	
DISTANCE FROM LAND IN MILES																			38.0								
DRILLING	VESSELS - Crew Diesel			7200	370,412	8889.87	12	51	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.57	0.95	0.52	0.02	37.55	1.08	0.00	5.95	0.01	
	VESSELS - Supply Diesel			7200	370,412	8889.87	12	103	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	3.13	1.89	1.83	0.05	75.11	2.16	0.00	11.78	0.02	
	VESSELS - Tugs Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Support Diesel, Laying			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Support Diesel, Burying			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PIPELINE INSTALLATION	VESSELS - Crew Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Supply Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Material Tug Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Crew Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Supply Diesel			0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
FACILITY INSTALLATION	VESSELS - Crew Diesel			0	0	0.00	0	0	0.00	0.00</																	

AIR EMISSIONS CALCULATIONS - 9TH YEAR

COMPANY		BLOCK	LEASE	FACILITY	WELL		CONTRACT	PHONE	REMARKS																				
OPERATIONS		EQUIPMENT	EQUIPMENT ID	RATING	MAX FUEL	ACT FUEL	PCE	RUN TIME	MAXIMUM POUNDS PER HOUR	ESTIMATED TONS																			
		Diesel Engines Net Gas Engines Burning	HP SCF/Hr	GAL/NR SCF/D	GAL/D SCF/D																								
		MMBTU/Hr	SCF/NR	HRD	DYR	TSP	PM10	PM2.5	SOx	Nox	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	Nox	VOC	Pb	CO	NH3						
DRILLING	VESSLS-Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	VESSLS-Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	VESSLS-Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	VESSLS-Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	Vessels - Diesel Borel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	Vessels - Drilling Prime Engine, Auxiliary	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
PIPELINE INSTALLATION	VESSLS - Pipeline Laying Vessel - Diesel	12000	617,382	14816.45	24	0	8.67	5.11	4.96	0.12	202.83	5.83	0.00	31.81	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	VESSLS - Pipeline Barge	8800	411,968	9877.63	24	0	8.64	3.41	3.30	0.00	156.22	3.89	0.00	21.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
FACILITY INSTALLATION		VESSLS - Heavy Lift Vessel(Derrick Barge Diesel)	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
PRODUCTION	RECIP-6000psi Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00						
	RECIP-4000psi Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00						
	VESSLS - Shuttle Tankers	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	VESSLS - Well Simulation	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	Natural Gas Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	Desal Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	Quid Fuel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	RECIP-2 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00						
	RECIP-4 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00						
	RECIP-4 Cycle Rich Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00						
	Diesel Borel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	Natural Gas Heater/Borel/Burner	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	MISC		BPD	SCF/NR	COUNT																								
	STORAGE TANK	COMBUSTION FLARE - no smoke	0	1	1	0	0.00	0.00	0.00	0.00	0.00	0.00	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.00	--	4.44	--					
		COMBUSTION FLARE - light smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
COMBUSTION FLARE - medium smoke		0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--						
COMBUSTION FLARE - heavy smoke		0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--						
COLD VENT		0	1	1	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--						
GLYCOL DEHYDRATOR		0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--						
WASTE INCINERATOR		0	1	1	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--						
FLUO		0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--						
DRILLING	Liquid Flaring	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
	COMBUSTION FLARE - no smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
	COMBUSTION FLARE - light smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
	COMBUSTION FLARE - medium smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
WELL TEST	COMBUSTION FLARE - heavy smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
ALASKA-SPECIFIC SOURCES		VESSLS	VESSLS - Ice Management Diesel	MW	HRD	DYR																							
2034		Facility Total Emissions	5	0	0	67.28	34.86	33.62	0.93	1,364.10	45.30	0.00	288.17	0.49	16.46	8.93	9.83	0.25	385.24	11.93	0.00	66.28	6.12						
EXEMPTION CALCULATION		DISTANCE FROM LAND IN MILES	38.0																										
DRILLING	VESSLS - Crew Diesel	7200	370,412	8889.87	12	51	3.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.57	0.95	0.92	0.02	37.55	1.08	0.00	5.69	0.01					
	VESSLS - Supply Diesel	7200	370,412	8889.87	12	103	0.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	3.13	1.89	1.83	0.05	75.11	2.16	0.00	11.78	0.02					
PIPELINE	VESSLS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	VESSLS - Support Diesel Laying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
INSTALLATION	VESSLS - Support Diesel Burying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	VESSLS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
FACILITY INSTALLATION	VESSLS - Support Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	VESSLS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
PRODUCTION	VESSLS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
	VESSLS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
ALASKA-SPECIFIC SOURCES		On-ice Equipment					GAL/NR	GAL/D																					
		Man Camp - Operation (maximum people per day)	PEOPLE/DAY																										
		VESSLS	MW	HRD	DYR																								
		On-ice - Loader	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00					
		On-ice - Other Construction Equipment	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00					
		On-ice - Other Survey Equipment	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00					
		On-ice - Tractor	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00					
		On-ice - Truck (for gravel island)	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00					
		On-ice - Truck (for survey)	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00					
		Man Camp - Operation	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00					
		VESSLS - Hovecraft Diesel	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
2034		Non-Facility Total Emissions	6.13	8.16	8.97	6.13	8.97	8.97	0.93	1,364.10	45.30	0.00	288.17	0.49	16.46	8.93	9.83	0.25	385.24	11.93	0.00	66.28	6.12						

AIR EMISSIONS CALCULATIONS - 10TH YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL				CONTACT	PHONE	REMARKS																		
PROJECT NAME	PROJECT CODE	WELL NAME	WELL CODE	WELL TYPE	WELL STATUS	WELL DEPTH	WELL DIRECTION	WELL ORIENTATION	WELL LOCATION	WELL COORDINATES	WELL COMMENTS																		
OPERATIONS	EQUIPMENT	EQUIPMENT ID	MAX. FUEL	ACT. FUEL	RUN TIME																								
	Diesel Engines	HP	GAL/HR	GAL/D																									
	Net Gas Engines	MMBTU/HR	SCF/HR	SCF/D																									
	Burners	MMBTU/HR	SCF/HR	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SO _x	NO _x	VOC	Pb	CO	NO ₂	TSP	PM10	PM2.5	SO _x	NO _x	VOC	Pb	CO	NO ₂					
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
PIPELINE INSTALLATION	VESSELS - Pipeline Laying Vessel - Diesel	12000	617.352	14816.43	24	0	8.47	5.11	4.95	0.12	202.83	5.83	0.00	31.81	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Pipeline Burying - Diesel	8000	411.568	9877.63	24	0	5.64	3.41	3.30	0.08	135.22	3.88	0.00	21.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
FACILITY INSTALLATION												ESTIMATED TONS																	
VESSELS - Heavy Lift Vessel/Service Barge Diesel												0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
PRODUCTION	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
	VESSELS - Shuttle Tankers	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Well Stimulation	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	Natural Gas Turbine	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
	Diesel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	Dual Fuel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	RECIP - 2 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
	RECIP - 4 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
	RECIP - 4 Cycle Rich Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
	Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	Natural Gas Heater/Boiler/Burner	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
MISC.												BPD																	
DRILLING	STORAGE TANK	162500	0	0	1	1	0.00	0.00	0.00	0.09	11.80	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--					
	COMBUSTION FLARE - no smoke	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
	COMBUSTION FLARE - light smoke	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
	COMBUSTION FLARE - medium smoke	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
	COMBUSTION FLARE - heavy smoke	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
	COLD VENT	0	0	1	1	1	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
	FUGITIVES	0	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
	GLYCOL DEHYDRATOR	0	0	1	1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
	WASTE INCINERATOR	0	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--					
	Liquid Flaring	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	COMBUSTION FLARE - no smoke	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
WELL TEST	COMBUSTION FLARE - light smoke	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
	COMBUSTION FLARE - medium smoke	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
	COMBUSTION FLARE - heavy smoke	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--					
ALASKA-SPECIFIC SOURCES												VESSELS																	
VESSELS - Ice Management Diesel												0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00					
2008 Facility Total Emissions												87.28	34.86	33.52	8.93	1,384.10	46.30	0.00	268.17	6.40	16.46	9.93	9.63	0.25	386.24	11.83	0.00	66.28	6.12
EXEMPTION CALCULATION												DISTANCE FROM LAND IN MILES																	
36.0												1,263.40																	
DRILLING	VESSELS - Crew Diesel	7200	370.4112	8889.87	12	51	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.57	0.95	0.92	0.02	37.55	1.08	0.00	5.95	0.01					
	VESSELS - Supply Diesel	7200	370.4112	8889.87	12	103	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	3.13	1.89	1.83	0.05	75.11	2.16	0.00	11.78	0.02					
	VESSELS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Support Diesel, Laying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Support Diesel, Burying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
PIPELINE INSTALLATION	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
FACILITY INSTALLATION	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
	VESSELS - Support Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
PRODUCTION	On-Ice Equipment																												
	Man Camp - Operation (maximum people per day)																												
	VESSELS																												
	On-Ice - Lander	0	0.0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00					
	On-Ice - Other Construction Equipment	0	0.0	0	0	0	0.00	0.00																					

AIR EMISSIONS CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	
LLOG Exploration Offshore, L.L.C.	546 / 503	OCS-G-25098 & OCS-G-27277	Who Dat	MC 546 SS007		

Year	Facility Emitted Substance								
	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
2026	21.54	12.99	12.60	0.32	516.94	15.33	0.00	85.37	0.15
2027	21.54	12.99	12.60	0.32	516.94	15.33	0.00	85.37	0.15
2028	21.54	12.99	12.60	0.32	516.94	15.33	0.00	85.37	0.15
2029	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	0.12
2030	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	0.12
2031	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	0.12
2032	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	0.12
2033	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	0.12
2034	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	0.12
2035	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	0.12
Allowable	1265.40			1265.40	1265.40	1265.40		38429.79	

COMPANY	LLOG Exploration Offshore, L.L.C.
AREA	Mississippi Canyon
BLOCK	546 / 503
LEASE	OCS-G-25098 & OCS-G-27277
FACILITY	Who Dat
WELL	MC 546 SS007
COMPANY CONTACT	Susan Sachitana
TELEPHONE NO.	985-801-4300
REMARKS	DP Semisubmersible - Drilling & Completion Operations

LEASE TERM PIPELINE CONSTRUCTION INFORMATION:		
YEAR	NUMBER OF PIPELINES	TOTAL NUMBER OF CONSTRUCTION DAYS
2026		
2027	4	30
2028		
2029		
2030		
2031		
2032		
2033		
2034		
2035		

*Actual Fuel was used in the calculations of these emissions based on historical use of vessels.

AIR EMISSIONS COMPUTATION FACTORS

Fuel Usage Conversion Factors		Natural Gas Turbines			Natural Gas Engines			Diesel Recip. Engine		Diesel Turbines		DATE	Reference Links
		SCF/hp-hr	9.524		SCF/hp-hr	7.143		GAL/hp-hr	0.0514	GAL/hp-hr	0.0514		
Equipment/Emission Factors	units	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	REF.		
Natural Gas Turbine	g/hp-hr		0.0086	0.0086	0.0026	1.4515	0.0095	0.3719	N/A		AP42 3.1-13.3.1-2a	4/93	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a01.pdf
RECIP. 2 Cycle Lean Natural Gas	g/hp-hr		0.1293	0.1293	0.0020	6.5995	0.4052	N/A	1.2009	N/A	AP42 3.2-1	7/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a02.pdf
RECIP. 4 Cycle Lean Natural Gas	g/hp-hr		0.0002	0.0002	0.0020	2.8814	0.4014	N/A	1.8949	N/A	AP42 3.2-2	7/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a02.pdf
RECIP. 4 Cycle Rich Natural Gas	g/hp-hr		0.0323	0.0323	0.0020	7.7224	0.1021	N/A	11.9408	N/A	AP42 3.2-3	7/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a02.pdf
Diesel Recip. < 600 hp	g/hp-hr	1	1	1	0.0279	14.1	1.04	N/A	3.03	N/A	AP42 3.3-1	10/96	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a03.pdf
Diesel Recip. > 600 hp	g/hp-hr	0.32	0.182	0.178	0.0055	10.9	0.29	N/A	2.5	N/A	AP42 3.4-1 & 3.4-2	10/96	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a04.pdf
Diesel Boiler	lbs/bbl	0.0840	0.0420	0.0105	0.0089	1.0080	0.0084	5.14E-05	0.2100	0.0336	AP42 1.3-6: Pb and NH3: Wet/FIRE (08/2018)	9/98 and 5/10	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a05.pdf
Diesel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0013	4.45E-05	0.0105	N/A	AP42 3.1-1 & 3.1-2a	4/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a01.pdf
Dual Fuel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0095	4.45E-05	0.3719	0.0000	AP42 3.1-1 & 3.1-2a; AP42 3.1-1 & 3.1-2a	4/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a01.pdf
Vessels – Propulsion	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI/TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nel-08a
Vessels – Drilling Prime Engine, Auxiliary	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI/TSP refer to Diesel Recip. > 600 hp reference	3/19	
Vessels – Diesel Boiler	g/hp-hr	0.0466	0.1491	0.1417	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI/TSP (units converted) refer to Diesel Boiler Reference	3/19	
Vessels – Well Stimulation	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI/TSP refer to Diesel Recip. > 600 hp reference	3/19	
Natural Gas Heater/Boiler/Burner	lbs/MMscf	7.60	1.90	1.90	0.60	190.00	5.50	5.00E-04	84.00	3.2	AP42 1.4-1 & 1.4-2: Pb and NH3: Wet/FIRE (08/2018)	7/98 and 5/18	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03a06.pdf
Combustion Flare (no smoke)	lbs/MMscf	0.00	0.00	0.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (light smoke)	lbs/MMscf	2.10	2.10	2.10	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (medium smoke)	lbs/MMscf	10.50	10.50	10.50	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	https://www3.epa.gov/ttnchie1/ap42/ch03/final/C13505_02-05-18.pdf
Combustion Flare (heavy smoke)	lbs/MMscf	21.00	21.00	21.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Liquid Flaring	lbs/bbl	0.42	0.0965	0.0651	5.964	0.84	0.01428	5.14E-05	0.21	0.0336	AP42 1.3-1 through 1.3-3 and 1.3-5	5/10	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01a03.pdf
Storage Tank	tons/yr/tank						4.300				2014 Gulfwide Inventory: Ag. ems (upper bound of 95% CI)	2017	https://www.boem.gov/boem/environmental-studies/2014-gulfwide-emission-inventory
Fugitives	lbs/hr/component						0.0005				API Study	12/93	https://www.epa.gov/air-emissions-inventories/2014-gulfwide-emission-inventory
Glycol Dehydrator	tons/yr/dehydrator						19.240				2011 Gulfwide Inventory: Ag. ems (upper bound of 95% CI)	2014	https://www.boem.gov/boem/environmental-studies/2014-gulfwide-emission-inventory
Cold Vent	tons/yr/vent						44.747				2014 Gulfwide Inventory: Ag. ems (upper bound of 95% CI)	2017	https://www.boem.gov/boem/environmental-studies/2014-gulfwide-emission-inventory
Waste Incinerator	lb/ton		15.0	15.0	2.5	2.0	N/A	N/A	20.0	N/A	AP 42 2.1-12	10/96	https://www3.epa.gov/ttnchie1/ap42/ch02/final/c02a01.pdf
On-ice – Loader	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice – Other Construction Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice – Other Survey Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice – Tractor	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice – Truck (for gravel island)	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice – Truck (for surveys)	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
Man Camp – Operation (max people/day)	tons/person/day		0.0004	0.0004	0.0004	0.006	0.001	N/A	0.001	N/A	BOEM 2014-1001	2014	https://www.boem.gov/sites/default/files/uploaded/Files/BOEM/BOEM_Newsroom/Library/Publications/2014-1001-1
Vessels – Ice Management Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI/TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nel-08a
Vessels – Hovcraft Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI/TSP refer to Diesel Recip. > 600 hp reference	3/19	

Sulfur Content Source	Value	Units
Fuel Gas	3.36	ppm
Diesel Fuel	0.0015	% weight
Produced Gas (Flare)	3.36	ppm
Produced Oil (Liquid Flaring)	1	% weight

Natural Gas Flare Parameters	Value	Units
VOC Content of Flare Gas	0.8816	lb VOC/lb-mol gas
Natural Gas Flare Efficiency	98	%

Density and Heat Value of Diesel Fuel	
Density	7.05 lbs/gal
Heat Value	19,300 Btu/lb

Heat Value of Natural Gas	
Heat Value	1,050 MMBtu/MMscf

AIR EMISSIONS CALCULATIONS - 1ST YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL				CONTACT	PHONE	REMARKS
OPERATIONS	EQUIPMENT	EQUIPMENT ID	BAYING	MAX. FUEL	ACT. FUEL	RUN TIME					
	Diesel Engines	HP	GAL/HR	GAL/D							
	Net Gas Engines	MMBTU/HR	SCF/HR	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx
	Burners						VOC	Pb	CO	NO2	
							TSP	PM10	PM2.5	SOx	NOx
							VOC	Pb	CO	NO2	
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling Prime Engine, Auxiliary	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
PIPELINE	VESSELS - Pipeline Laying Vessel - Diesel	12000	617.352	14816.43	24	30	8.47	5.11	4.95	0.12	202.83
INSTALLATION	VESSELS - ROV vessel	8000	411.588	9877.63	24	30	5.64	3.41	3.30	0.08	135.22
FACILITY INSTALLATION	VESSELS - Heavy Lift Vessel/Service Barge Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
PRODUCTION	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Shuttle Tankers	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Well Stimulation	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	Natural Gas Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	Diesel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	Dual Fuel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	RECIP - 2 Cycle Lean Natural Gas	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	RECIP - 4 Cycle Lean Natural Gas	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	RECIP - 4 Cycle Rich Natural Gas	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	Natural Gas Heater/Boiler/Burner	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
MISC.		BPD	SCF/HR	COUNT							
	STORAGE TANK	162500	0	1	1						
	COMBUSTION FLARE - no smoke	24	7	0.00	0.00	0.00	0.09	11.80	5.84	--	52.89
	COMBUSTION FLARE - light smoke	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00
	COMBUSTION FLARE - medium smoke	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00
	COMBUSTION FLARE - heavy smoke	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00
	COLD VENT	0	1	1	1						
	FUGITIVES	0	0	0	--	--	--	--	--	--	--
	GLYCOL DEHYDRATOR	0	0	1	1						
	WASTE INCINERATOR	0	0	0	--	--	--	--	--	--	--
DRILLING	Liquid Flaring	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	COMBUSTION FLARE - no smoke	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	COMBUSTION FLARE - light smoke	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	COMBUSTION FLARE - medium smoke	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	COMBUSTION FLARE - heavy smoke	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ALASKA-SPECIFIC SOURCES	VESSELS	HW		HR/D	D/YR						
	VESSELS - Ice Management Diesel	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
2026 Facility Total Emissions						87.28	34.86	33.52	8.93	1,384.10	46.30
EXEMPTION	DISTANCE FROM LAND IN MILES										
CALCULATION	36.0										
DRILLING	VESSELS - Crew Diesel	7200	370.4112	8889.87	12	51	5.08	3.06	2.97	0.07	121.70
	VESSELS - Supply Diesel	7200	370.4112	8889.87	12	103	5.08	3.06	2.97	0.07	121.70
	VESSELS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
PIPELINE	VESSELS - Support Diesel, Laying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
INSTALLATION	VESSELS - Support Diesel, Burying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
FACILITY	VESSELS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
INSTALLATION	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
PRODUCTION	VESSELS - Support Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00
ALASKA-SPECIFIC SOURCES	On-Ice Equipment		GAL/HR	GAL/D							
	Man Camp - Operation (maximum people per day)	PEOPLE/DAY									
	VESSELS	HW		HR/D	D/YR						
	On-Ice - Lander	0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	On-Ice - Other Construction Equipment	0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	On-Ice - Other Survey Equipment	0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	On-Ice - Tractor	0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	On-Ice - Truck (for gravel island)	0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	On-Ice - Truck (for surveys)	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	Man Camp - Operation	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Hovercraft Diesel	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
2026 Non-Facility Total Emissions						18.16	6.13	5.56	6.16	343.40	7.00

AIR EMISSIONS CALCULATIONS - 2ND YEAR

[illegible]

AIR EMISSIONS CALCULATIONS - 3RD YEAR

[illegible]

AIR EMISSIONS CALCULATIONS - 4TH YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL				CONTACT	PHONE	REMARKS	ESTIMATED YONS													
OPERATIONS	EQUIPMENT	EQUIPMENT ID	BAYING	MAX. FUEL	ACT. FUEL	RUN TIME						ESTIMATED YONS													
	Diesel Engines	HP	MMBTU/HR	SCFH	SCFD	HR/D	D/YR	TSP	PM10	PM2.5	SOX	NOX	VOC	Pb	CO	NO2	TSP	PM10	PM2.5	SOX	NOX	VOC	Pb	CO	NO2
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling Prime Engine, Auxiliary	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PIPELINE	VESSELS - Pipeline Laying Vessel - Diesel	12000	617,352	14816.43	24	0	8.47	5.11	3.30	0.08	135.22	3.89	0.00	21.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
INSTALLATION	VESSELS - Pipeline Burying - Diesel	8000	411,568	9877.63	24	0	5.64	3.41	3.30	0.08	135.22	3.89	0.00	21.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	VESSELS - Heavy Lift Vessel/Service Barge Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PRODUCTION	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	VESSELS - Shuttle Tankers	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Well Stimulation	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Natural Gas Turbine	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	Diesel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dual Fuel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RECIP - 2 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 4 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 4 Cycle Rich Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Natural Gas Heater/Boiler/Burner	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MISC.		BPD	SCFH	COUNT																					
	STORAGE TANK	162500	0	1	1									0.00	--										
	COMBUSTION FLARE - no smoke	24	7	0.00	0.00	0.00	0.09	11.80	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--				
	COMBUSTION FLARE - light smoke	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--				
	COMBUSTION FLARE - medium smoke	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--				
	COMBUSTION FLARE - heavy smoke	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--				
	COLD VENT	0	1	1	1									0.00	--										
	FUGITIVES	0	0	0	--			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	GLYCOL DEHYDRATOR	0	1	1	--			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	WASTE INCINERATOR	0	0	0	--			0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
DRILLING	Liquid Flaring	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	COMBUSTION FLARE - no smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - light smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - medium smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
ALASKA-SPECIFIC SOURCES	VESSELS	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	VESSELS - Ice Management Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
2025	Facility Total Emissions						87.28	34.86	33.52	8.93	1,384.10	46.30	0.00	269.17	0.40	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	6.12	
EXEMPTION	DISTANCE FROM LAND IN MILES																1,263.40		1,265.40	1,265.40	1,265.40			38,429.79	
CALCULATION	3E-3																								
DRILLING	VESSELS - Crew Diesel	7200	370,412	8889.87	12	51	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.57	0.95	0.52	0.02	37.55	1.08	0.00	5.95	0.01	
	VESSELS - Supply Diesel	7200	370,412	8889.87	12	103	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	3.13	1.89	1.83	0.05	75.11	2.16	0.00	11.78	0.02	
	VESSELS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PIPELINE	VESSELS - Support Diesel, Laying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
INSTALLATION	VESSELS - Support Diesel, Burying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
FACILITY	VESSELS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
INSTALLATION	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PRODUCTION	VESSELS - Support Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ALASKA-SPECIFIC SOURCES	On-Ice Equipment																								
	Man Camp - Operation (maximum people per day)																								
	VESSELS																								
	On-Ice - Lander	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice - Other Construction Equipment	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice - Other Survey Equipment	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice - Tractor	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice - Truck (for																								

AIR EMISSIONS CALCULATIONS - 5TH YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL				CONTACT	PHONE	REMARKS	VESSEL'S COMBUSTION EMISSIONS														
OPERATIONS	EQUIPMENT	EQUIPMENT ID	BAYING	MAX. FUEL	ACT. FUEL	RUN TIME				MAXIMUM POUNDS PER HOUR		ESTIMATED TONS														
	Diesel Engines Nat. Gas Engines Burners	HP SCFH MMBTU/Hr	HP SCFH SCF/D	SCFH	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SO _x	NO _x	VOC	Pb	CO	NH ₃	TSP	PM10	PM2.5	SO _x	NO _x	VOC	Pb	CO	NH ₃	
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Drilling Prime Engine, Auxiliary	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PIPELINE INSTALLATION	VESSELS - Pipeline Laying Vessel - Diesel	12000	617,352	14816.43	24	0	8.47	5.11	4.95	0.12	202.83	5.83	0.00	31.81	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Pipeline Burying - Diesel	8000	411,568	9877.63	24	0	5.64	3.41	3.30	0.08	135.22	3.88	0.00	21.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
FACILITY INSTALLATION	VESSELS - Heavy Lift Vessel/ Derrick Barge Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PRODUCTION	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	VESSELS - Shuttle Tankers	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Well Stimulation	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Natural Gas Turbine	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	Diesel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Dual Fuel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	RECIP - 2 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 4 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 4 Cycle Rich Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Natural Gas Heater/Boiler/Burner	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	MISC.	BPD	SCF/Hr	COUNT																						
DRILLING WELL TEST	STORAGE TANK	162500	0	1	1								0.00	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	--	
	COMBUSTION FLARE - no smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - light smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - medium smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COLD VENT	0	1	1	1								0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	FUGITIVES	0	0	0	0								0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	GLYCOL DEHYDRATOR	0	0	1	1								0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	WASTE INCINERATOR	0	0	0	0								0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	Liquid Flaring	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ALASKA-SPECIFIC SOURCES	COMBUSTION FLARE - no smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
	COMBUSTION FLARE - light smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - medium smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
2008 Facility Total Emissions		0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
EXEMPTION CALCULATION								87.28	34.86	33.52	8.93	1,384.10	46.30	0.00	268.17	6.40	16.46	9.93	9.63	0.25	386.24	11.83	0.00	66.28	6.12	
DISTANCE FROM LAND IN MILES																	1,263.40		1,265.40	1,265.40	1,265.40			38,429.79		
38.0																										
DRILLING	VESSELS - Crew Diesel	7200	370,412	8889.87	12	51	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.57	0.95	0.92	0.02	37.55	1.08	0.00	5.85	0.01		
	VESSELS - Supply Diesel	7200	370,412	8889.87	12	103	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	3.13	1.89	1.83	0.05	75.11	2.16	0.00	11.78	0.02		
PIPELINE INSTALLATION	VESSELS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Support Diesel, Laying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
FACILITY INSTALLATION	VESSELS - Support Diesel, Burying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PRODUCTION	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ALASKA-SPECIFIC SOURCES	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
On-Ice Equipment	Man Camp - Operation (maximum people per day)			PEOPLE/DAY																						
	VESSELS			NW			HR/D	D/YR																		
	On-Ice - Lander	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
	On-Ice - Other Construction Equipment	0	0	0	0	0	0.00	0.00	0																	

AIR EMISSIONS CALCULATIONS - 6TH YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL				CONTACT	PHONE	REMARKS	VESSEL'S COMBUSTION EMISSIONS													
OPERATIONS	EQUIPMENT	EQUIPMENT ID	BAYING	MAX. FUEL	ACT. FUEL	RUN TIME						ESTIMATED TONS													
	Diesel Engines Nat. Gas Engines Burners	HP SCFH MMBTU/Hr	HP SCFH SCF/D	SCFH	SCF/D	HR/D	D/YR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PIPELINE INSTALLATION	VESSELS - Pipeline Laying Vessel - Diesel	12000	617,352	14816.43	24	0	8.47	5.11	3.30	0.06	135.22	3.89	0.00	21.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Pipeline Burying - Diesel	8000	411,568	9877.63	24	0	5.64	3.41	3.30	0.06	135.22	3.89	0.00	21.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
FACILITY INSTALLATION		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PRODUCTION	VESSELS - Heavy Lift Vessel/Service Barge Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	
	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	
	VESSELS - Shuttle Tankers	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Well Stimulation	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Natural Gas Turbine	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	Diesel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Dual Fuel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	RECIP - 2 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	RECIP - 4 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	RECIP - 4 Cycle Rich Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
MISC.	Natural Gas Heater/Boiler/Burner	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	STORAGE TANK	0	0	0.00	0	1	1	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	
	COMBUSTION FLARE - no smoke	162500	24	7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.80	5.84	--	52.89	--	0.00	0.00	0.00	0.01	0.97	0.49	--	4.44	
	COMBUSTION FLARE - light smoke	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - medium smoke	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - heavy smoke	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COLD VENT	0	0	1	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	FUGITIVES	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
	GLYCOL DEHYDRATOR	0	0	1	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	WASTE INCINERATOR	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
DRILLING WELL TEST	Liquid Flaring	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	COMBUSTION FLARE - no smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - light smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	COMBUSTION FLARE - medium smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
ALASKA-SPECIFIC SOURCES	COMBUSTION FLARE - heavy smoke	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	
	VESSELS - Ice Management Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
2021 Facility Total Emissions							87.28	34.86	33.52	0.93	1,384.10	46.30	0.00	269.17	0.40	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	6.12	
EXEMPTION CALCULATION																	1,263.40		1,265.40	1,265.40	1,265.40			38,429.79	
DRILLING	VESSELS - Crew Diesel	7200	370,412	8889.87	12	51	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.57	0.95	0.92	0.02	37.55	1.08	0.00	5.95	0.01	
	VESSELS - Supply Diesel	7200	370,412	8889.87	12	103	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	3.13	1.89	1.83	0.05	75.11	2.16	0.00	11.78	0.02	
PIPELINE INSTALLATION	VESSELS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Support Diesel, Laying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
FACILITY	VESSELS - Support Diesel, Burying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ALASKA-SPECIFIC SOURCES	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PRODUCTION	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
On-Ice Equipment	Man Camp - Operation (maximum people per day)																								
	VESSELS																								
	On-Ice - Lander	0	0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
	On-Ice - Other Construction Equipment	0	0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
	On-Ice - Other Survey Equipment	0	0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
	On-Ice - Tractor	0	0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
	On-Ice - Truck (for gravel island)	0	0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	
	On-Ice - Truck (for surveys)	0	0	0.0	0	0	0.00	0.00																	

AIR EMISSIONS CALCULATIONS - 7TH YEAR

[illegible]

AIR EMISSIONS CALCULATIONS - 8TH YEAR

[illegible]

AIR EMISSIONS CALCULATIONS - 8TH YEAR

[illegible]

AIR EMISSIONS CALCULATIONS - 10TH YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL						CONTACT	PHONE	REMARKS												
OPERATIONS	EQUIPMENT	EQUIPMENT ID	RATING	MAX FUEL ACT FUEL	RUN TIME								MAXIMUM POUNDS PER HOUR												
	Diesel Engines	HP	MMBTU/HR	SCFH	SCFD	HR/D	D/YR	TSP	PM10	PM2.5	SOX	NOX	VOC	Pb	CO	NO2	TSP	PM10	PM2.5	SOX	NOX	VOC	Pb	CO	NO2
DRILLING	VESSELS - Lifting - Propulsion Engine - Diesel	0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel	0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling Prime Engine, Auxiliary	0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PIPELINE INSTALLATION	VESSELS - Pipeline Laying Vessel - Diesel	12000	617,352	14816.43	24	0	8.47	5.11	4.95	0.12	202.83	5.83	0.00	31.81	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Pipeline Burying - Diesel	8000	411,568	9877.63	24	0	5.64	3.41	3.30	0.08	135.22	3.88	0.00	21.21	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	VESSELS - Heavy Lift Vessel/Service Barge Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PRODUCTION	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 600hp Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	VESSELS - Shuttle Tankers	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Well Stimulation	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Natural Gas Turbine	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	Diesel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Dual Fuel Turbine	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	RECIP - 2 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 4 Cycle Lean Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	RECIP - 4 Cycle Rich Natural Gas	0	0	0.00	0	0	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	--	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	Diesel Boiler	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Natural Gas Heater/Boiler/Burner	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MISC.		BPD	SCFH	COUNT																					
STORAGE TANK	COMBUSTION FLARE - no smoke	162500	0	1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	COMBUSTION FLARE - light smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - medium smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COLD VENT	0	1	1	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	FUGITIVES	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	GLYCOL DEHYDRATOR	0	0	0	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	WASTE INCINERATOR	0	0	0	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
DRILLING	Liquid Flaring	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	COMBUSTION FLARE - no smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - light smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - medium smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - heavy smoke	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
ALASKA-SPECIFIC SOURCES	VESSELS	NW		HR/D	D/YR																				
	VESSELS - Ice Management Diesel	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
2026	Facility Total Emissions					87.28	34.86	33.52	0.93	1,384.10	46.30	0.00	268.17	0.40	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	6.12		
EXEMPTION CALCULATION	DISTANCE FROM LAND IN MILES																1,263.40			1,265.40	1,265.40			38,429.79	
DRILLING	VESSELS - Crew Diesel	7200	370,412	8889.87	12	51	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	1.57	0.95	0.52	0.02	37.55	1.08	0.00	5.95	0.01	
	VESSELS - Supply Diesel	7200	370,412	8889.87	12	103	5.08	3.06	2.97	0.07	121.70	3.50	0.00	19.09	0.04	3.13	1.89	1.83	0.05	75.11	2.16	0.00	11.78	0.02	
	VESSELS - Tugs Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Support Diesel, Laying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Support Diesel, Burying	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PIPELINE INSTALLATION	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Material Tug Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
FACILITY INSTALLATION	VESSELS - Crew Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Supply Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PRODUCTION	VESSELS - Support Diesel	0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ALASKA-SPECIFIC SOURCES	On-Ice Equipment																								
	Man Camp - Operation (maximum people per day)	PEOPLE/DAY																							
	VESSELS	NW		HR/D	D/YR																				
	On-Ice - Loader	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0	0.00	0.00
	On-Ice - Other Construction Equipment	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
	On-Ice - Other Survey Equipment	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
	On-Ice - Tractor	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00
	On-Ice - Truck (for gravel island)	0	0	0	0	0.00	0.00	0.00	0.00	0.00															

AIR EMISSIONS CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	
LLOG Exploration Offshore, L.L.C.	546 / 503	OCS-G-25098 & OCS-G-27277	Who Dat	MC 546 SS007		

Year	Facility Emitted Substance								
	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
2026	21.54	12.99	12.60	0.32	516.94	15.33	0.00	85.37	0.15
2027	21.54	12.99	12.60	0.32	516.94	15.33	0.00	85.37	0.15
2028	21.54	12.99	12.60	0.32	516.94	15.33	0.00	85.37	0.15
2029	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	0.12
2030	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	0.12
2031	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	0.12
2032	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	0.12
2033	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	0.12
2034	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	0.12
2035	16.46	9.93	9.63	0.25	395.24	11.83	0.00	66.28	0.12
Allowable	1265.40			1265.40	1265.40	1265.40		38429.79	

Fuel Logs for Sevan Louisiana – DP Semisubmersible

July, August, September, October 2016

	Sevan Louisiana											
Date	Fuel on Rig	Fuel Used	Fuel Received	Fuel on Rig	Fuel Used	Fuel Received	Fuel on Rig	Fuel Used	Fuel Received	Correct		
	BCO Report	BCO Report	BCO Report	Drilling Rpt	Drilling Rpt	BCO Report	Drilling Rpt	Drilling Rpt	Drilling Rpt	Yes / No		
7/1/2016	976108	5812			976108			5812		Yes		
7/2/2016	957880	18228			957880			18228		Yes		
7/3/2016	947049	10831			947049			10831		Yes		
7/4/2016	935690	11359			935690			11359		Yes		
7/5/2016	926444	9246			926444			9246		Yes		
7/6/2016	914292	12152			914292			12152		Yes		
7/7/2016	901084	13209			901084			13208		No - 1		
7/8/2016	884177	16907			884177			16907		Yes		
7/9/2016	919840	15586	51249		919840			15586		51249	Yes	
7/10/2016	911122	8718			911122			8718		Yes		
7/11/2016	1024980	16114	129972		1024980			16114		129972	Yes	
7/12/2016	1011507	13473			1011507			13473		Yes		
7/13/2016	994072	17435			994072			17435		Yes		
7/14/2016	983505	10567			983505			10567		Yes		
7/15/2016	971881	11623			971881			11623		No +1		
7/16/2016	953918	17964			953918			17964		No -1		
7/17/2016	937275	16643			937275			16643		Yes		
7/18/2016	925123	12152			925123			12152		Yes		
7/19/2016	911387	13737			911387			13737		No +1		
7/20/2016	902669	8718			902669			8718		Yes		
7/21/2016	888404	14265			888404			14265		Yes		
7/22/2016	868063	20341			868063			20341		Yes		
7/23/2016	853533	14529			853533			14529		Yes		
7/24/2016	840589	12944			840589			12944		Yes		
7/25/2016	829230	11359			829230			11359		Yes		
7/26/2016	943879	14001	128651		943879			14001		128651	No +1	
7/27/2016	929350	14529			929350			14529		No BCO -300		
7/28/2016	914292	15058			914292			15358		No RPT +300		

7/29/2016	903461	10831			903461	10831			Yes
7/30/2016	1028414	11888	136840		1028414	11888		136840	No -1
7/31/2016	1015205	13209			1015205	13209			Yes
Date	Fuel on Rig	Fuel Used	Fuel Received	Fuel on Rig	Fuel Used	Fuel Received			Correct
	BCO Report	BCO Report	BCO Report	Drilling Rpt	Drilling Rpt	Drilling Rpt			Yes / No
8/1/2016	1002789	12416		1002789	12416				Yes
8/2/2016	988788	14001		988788	14001				Yes
8/3/2016	973995	14793		973995	14793				Yes
8/4/2016	959201	14794		959201	14794				Yes
8/5/2016	947314	11888		947314	11887				No-1
8/6/2016	936483	10831		936483	10831				Yes
8/7/2016	1064077	10723	138317	1064077	10723				Yes
8/8/2016	1049019	15058		1049019	15058				Yes
8/9/2016	1033433	15586		1033433	15586				Yes
8/10/2016	1018375	15058		1018375	15058				Yes
8/11/2016	1001468	16907		1001468	16907				Yes
8/12/2016	989317	12152		989317	12152				No -1
8/13/2016	976372	12944		976372	12944				No +1
8/14/2016	1101061	10567	135255	1101061	10567				Yes
8/15/2016	1085739	15322		1085739	15322				Yes
8/16/2016	1068568	17171		1068568	17171				Yes
8/17/2016	1055359	13209		1055359	13209				Yes
8/18/2016	1041094	14265		1041094	14265				Yes
8/19/2016	1027621	13473		1027621	13473				Yes
8/20/2016	1016790	10831		1016790	10831				Yes
8/21/2016	1007809	8982		1007809	8981				Yes
8/22/2016	996978	10831		996978	10831				Yes
8/23/2016	981920	15058		981920	15058				Yes
8/24/2016	973731	8189		973731	8189				Yes
8/25/2016	959465	14265		959465	14266				Yes
8/26/2016	942030	17435		942030	17435				Yes

[illegible]

9/23/2016	867534	14001	14001	867534	14001	Yes	
9/24/2016	856967	10567	10567	856967	10567	Yes	
9/25/2016	849571	7397	7396	849571	7396	Yes	
9/26/2016	964221	16114	130764	964221	16114	130764	Yes
9/27/2016	951805	12416		951805	12416		Yes
9/28/2016	940445	11359		940445	11360		Yes
9/29/2016	927765	12680		927765	12680		Yes
9/30/2016	919576	8189		919576	8189		Yes
Date	Fuel on Rig	Fuel Used	Fuel Received	Fuel on Rig	Fuel Used	Fuel Received	Correct
	BCO Report	BCO Report	BCO Report	Drilling Rpt	Drilling Rpt	Drilling Rpt	Yes / No
10/1/2016	905839	13737			905839	13737	Yes
10/2/2016	1025772	15058	134991		1025772	15058	134991
10/3/2016	1013620	12152			1013620	12152	Yes
10/4/2016	1003053	10567			1003053	10567	Yes
10/5/2016	989317	13737			989317	13737	Yes
10/6/2016	976901	12416			976901	12416	Yes
10/7/2016	966070	10831			966070	10831	Yes
10/8/2016	951540	14529			951540	14529	No Adj +1
10/9/2016	941238	10303			941238	10303	Yes
10/10/2016	927765	13473			927765	13473	Yes
10/11/2016	919312	8453			919312	8453	Yes
10/12/2016	907952	11359			907952	11359	Yes
10/13/2016	895536	12416			895536	12416	Yes
10/14/2016	885498	10038			885498	10038	Yes
10/15/2016	992487	6868	113857		992487	6868	113857
10/16/2016	979542	12944			979542	12944	No Adj +1
10/17/2016	967391	12152			967391	12152	No Adj -1
10/18/2016	959465	7925			959465	7925	No Adj +1
10/19/2016	947842	11623			939917	11623	Yes
10/20/2016	931199	16643			931199	16643	2 reports - 7925 on other
10/21/2016	921161	10038			921161	10038	Yes
10/22/2016	908481	12680			908481	12680	Yes

10/23/2016	895272	13209		895272	13209	Yes
10/24/2016						
10/25/2016						
10/26/2016						
10/27/2016						
10/28/2016						
10/29/2016						
10/30/2016						
10/31/2016						

Fuel Usage

Drillship - Seadrill West Neptune

MC 503 #01 OCS-G-27277 (Plugback)

Apr-26

Date	Fuel on Rig	Fuel Used	Fuel Received	Boat & Well Info. Change
4/1/2026	991,804.80	19,802.20		Transit to MC503. MC 503 #001 (Plugback)
4/2/2026	982,947.00	8,857.80		MC 503 #001 (Plugback)
4/3/2026	975,185.40	7,761.60		MC 503 #001 (Plugback)
4/4/2026	967,764.00	7,421.00		MC 503 #001 (Plugback)
4/5/2026	960,384.60	7,379.40		MC 503 #001 (Plugback)
4/6/2026	951,594.00	8,790.60		MC 503 #001 (Plugback)
4/7/2026	943,992.00	7,602.00		MC 503 #001 (Plugback)
4/8/2026	934,521.00	9,471.00		MC 503 #001 (Plugback)
4/9/2026	982,244.40	9,631.80	57,355.20	MC 503 #001 (Plugback)
4/10/2026	1,015,102.20	9,595.80	42,453.60	MC 503 #001 (Plugback)
4/11/2026	1,006,450.20	8,652.00		MC 503 #001 (Plugback)
4/12/2026	997,899.00	8,551.20		MC 503 #001 (Plugback)
4/13/2026	1,113,058.80	10,273.20	125,433.00	MC 503 #001 (Plugback)
4/14/2026	1,100,899.80	12,159.00		MC 503 #001 (Plugback)
4/15/2026	1,094,171.40	6,728.40		MC 503 #001 (Side Track)
4/16/2026	1,084,410.60	9,760.80		MC 503 #001 (Side Track)
4/17/2026	1,075,653.60	8,757.00		MC 503 #001 (Side Track)
4/18/2026	1,129,111.20	10,395.00	63,852.60	MC 503 #001 (Side Track)
4/19/2026	1,117,922.40	11,188.80		MC 503 #001 (Side Track)
4/20/2026	1,149,451.80	12,507.60	44,037.00	MC 503 #001 (Side Track)
4/21/2026	1,137,015.60	12,436.20		MC 503 #001 (Side Track)
4/22/2026	1,125,679.80	11,335.80		MC 503 #001 (Side Track)
4/23/2026	1,112,974.80	12,705.00		MC 503 #001 (Side Track)
4/24/2026	1,102,710.00	10,264.80		MC 503 #001 (Side Track)
4/25/2026	1,094,721.60	7,988.40		MC 503 #001 (Side Track)
4/26/2026	1,230,024.60	10,735.00	146,038.20	MC 503 #001 (Side Track)
4/27/2026	1,219,197.00	10,827.60		MC 503 #001 (Side Track)
4/28/2026	1,208,352.60	10,844.40		MC 503 #001 (Side Track)
4/29/2026	1,196,932.80	11,419.80		MC 503 #001 (Side Track)
4/30/2026	1,187,701.20	9,231.80		MC 503 #001 (Side Track)
TOTAL FUEL USED		303,075	479,170	

MC 503 #01 OCS-G-27277 Completion

May-26

Date	Fuel on Rig	Fuel Used	Fuel Received	Boat & Well Info. Change
5/1/2026		9,022.00		
5/2/2026		10,462.00		
5/3/2026		11,369.00		
5/4/2026		8,492.00		
5/5/2026		10,534.00		
5/6/2026	1,128,792.00	4,255.00		MC 503 #001 (Completion)
5/7/2026	1,120,093.80	8,698.20		MC 503 #001 (Completion)
5/8/2026	1,110,127.20	9,966.60		MC 503 #001 (Completion)
5/9/2026	1,101,265.20	8,862.00		MC 503 #001 (Completion)
5/10/2026	1,094,713.20	6,552.00		MC 503 #001 (Completion)
5/11/2026	1,085,532.00	9,181.20		MC 503 #001 (Completion)
5/12/2026	1,187,394.60	10,941.00	112,803.60	MC 503 #001 (Completion)
5/13/2026	1,178,700.60	8,694.00		MC 503 #001 (Completion)
5/14/2026	1,170,216.60	8,484.00		MC 503 #001 (Completion)
5/15/2026	1,161,337.80	8,878.80		MC 503 #001 (Completion)
5/16/2026	1,152,685.80	8,652.00		MC 503 #001 (Completion)
5/17/2026	1,142,450.40	10,235.40		MC 503 #001 (Completion)
5/18/2026	1,134,595.20	7,855.20		MC 503 #001 (Completion)
5/19/2026	1,124,705.40	9,889.80		MC 503 #001 (Completion)
5/20/2026	1,115,058.00	9,647.40		MC 503 #001 (Completion)
5/21/2026	1,106,574.00	8,484.00		MC 503 #001 (Completion)
5/22/2026	1,097,317.20	9,256.80		MC 503 #001 (Completion)
5/23/2026	1,209,621.00	9,089.00	121,392.60	MC 503 #001 (Completion)
5/24/2026	1,199,263.80	10,357.20		MC 503 #001 (Completion)
5/25/2026	1,191,619.80	7,644.00		MC 503 #001 (Completion)
5/26/2026	1,182,321.00	9,299.00		MC 503 #001 (Completion)
5/27/2026	1,172,543.40	9,777.60		MC 503 #001 (Completion)
5/28/2026	1,163,290.80	9,252.60		MC 503 #001 (Completion)
5/29/2026	1,154,298.60	8,992.20		MC 503 #001 (Completion)
5/30/2026	1,145,520.60	8,778.00		MC 503 #001 (Completion)
5/31/2026	1,136,116.80	9,403.80		
TOTAL FUEL USED		281,006	234,196	

MC 503 #01 OCS-G-27277 Completion

Jun-26

Date	Fuel on Rig	Fuel Used	Fuel Received	Boat & Well Info. Change
6/1/2026	1,126,246.80	9,870.00		MC 503 #001 (Completion)
6/2/2026	1,116,708.60	9,538.40		MC 503 #001 (Completion)
6/3/2026	1,108,396.80	8,311.80		MC 503 #001 (Completion)
6/4/2026	1,098,791.40	9,605.40		MC 503 #001 (Completion)
6/5/2026	1,089,190.20	9,601.20		MC 503 #001 (Completion)
6/6/2026	1,234,262.40	10,848.60	155,920.80	MC 503 #001 (Completion)
6/7/2026	1,224,476.40	9,786.00		MC 503 #001 (Completion)
6/8/2026	1,215,580.80	8,895.60		MC 503 #001 (Completion)
6/9/2026	1,205,227.80	10,353.00		MC 503 #001 (Completion)
6/10/2026	1,196,483.40	8,744.40		MC 503 #001 (Completion)
6/11/2026	1,188,608.40	7,875.00		MC 503 #001 (Completion)
6/12/2026	1,179,095.40	9,513.00		MC 503 #001 (Completion)
6/13/2026	1,171,531.20	7,564.20		MC 503 #001 (Completion)
6/14/2026	1,161,522.60	10,008.60		MC 503 #001 (Completion)
6/15/2026	1,152,677.40	8,845.20		MC 503 #001 (Completion)
6/16/2026	1,143,248.40	9,429.00		MC 503 #001 (Completion)
6/17/2026	1,132,135.20	11,113.20		MC 503 #001 (Completion)
6/18/2026	1,120,438.20	11,697.00		MC 503 #001 (Completion)
6/19/2026	1,111,021.80	9,416.40		MC 503 #001 (Completion)
6/20/2026	1,101,122.40	9,899.40		MC 503 #001 (Completion)
6/21/2026	1,094,074.80	7,047.60		MC 503 #001 (Completion)
6/22/2026	1,085,128.80	8,946.00		MC 503 #001 (Completion)
6/23/2026	1,076,069.40	9,059.40		MC 503 #001 (Completion)
6/24/2026	1,240,860.60	10,361.80	175,152.60	MC 503 #001 (Completion)
6/25/2026	1,232,490.00	8,371.00		MC 503 #001 (Completion)
6/26/2026	1,223,426.40	9,063.60		MC 503 #001 (Completion)
6/27/2026	1,216,462.80	6,963.60		MC 503 #001 (Completion)
6/28/2026	1,209,272.40	7,190.40		MC 503 #001 (Completion)
6/29/2026	1,201,468.80	7,803.20		MC 503 #001 (Completion)
6/30/2026	1,192,623.60	8,845.40		MC 503 #001 (Completion)
TOTAL FUEL USED		274,567	331,073	

APPENDIX I
OIL SPILL INFORMATION
(30 CFR PART 550.219 AND 550.250)

A. Oil Spill Response Planning

All the proposed activities in this Supplemental Development Operations Coordination Document will be covered by the Oil Spill Response Plan filed by LLOG (No. 02058) in accordance with 30 CFR 254, our biennial update was filed on June 17, 2026 and was found to be in compliance on July 17, 2026.

The WCD proposed in this Plan does not exceed the WCD outlined in our OSRP.

B. Spill Response Sites

The following locations will be used in the event an oil spill occurs as a result of the proposed activities.

Primary Response Equipment Location	Pre-Planned Staging Location(s)
Houma, LA	Venice, LA

C. OSRO Information

The O'Brien Group (TOG) will provide trained personnel capable of providing supervisory management of the oil spill response in addition to contacting and deploying cleanup personnel and equipment

LLOG utilizes Clean Gulf Associates (CGA) as it's primary provider for equipment, which is an industry cooperative owning an inventory of oil spill clean-up equipment. CGA is supported by the Marine Spill Response Corporation's (MSRC), which is responsible for storing, inspecting, maintaining and dispatching CGA's equipment. The MSRC STARS network provides for the closest available personnel, as well as an MSRC supervisor to operate the equipment.

D. Worst-Case Scenario Information

<i>Category</i>	<i>Regional OSRP</i>	<i>Supplemental DOCD</i>
Type of Activity	Development	Development
Facility Surface Location	Keathley Canyon Block 689	Mississippi Canyon 547
Facility Description	Platform "A"	Location A
Distance to Nearest Shoreline (Miles)	224 miles	38 miles
Volume: Storage Tanks (total) Facility Piping (total) Lease Term Pipeline Uncontrolled Blowout (day) Barging Potential 24 Hour Volume (bbls)	 47,699 bbls	 3,902 bbls 200 bbls 1,908 bbls 29,440 bbls 35,450 bbls/day
Type of Liquid Hydrocarbon	Crude Oil	Crude Oil
API Gravity	32.1°	27.0°

<i>Category</i>	<i>Regional OSRP</i>	<i>Supplemental DOCD</i>
Type of Activity	Drilling	Drilling
Facility Surface Location	Mississippi Canyon Block 386	Mississippi Canyon 546
Facility Description	Well Loc B	Well No. SS006 (G2)
Distance to Nearest Shoreline (Miles)	58 miles	38 miles
Potential 24 Hour Volume (bbls)	396,602 bbls	109,127 BOPD
Total Volume (Max duration 70 days)		~7,638,890 bbls
Type of Liquid Hydrocarbon	Condensate	Crude Oil
API Gravity	25°	28.0°

LLOG Exploration Offshore, L.L.C. (LLOG) has the capability to respond to the appropriate worst-case spill scenario included in its regional OSRP Plan, by LLOG (No. 02058) in accordance with 30 CFR 254, our biennial update was filed on June 17, 2026 and was found to be in compliance on July 17, 2026.

Since LLOG Exploration Offshore, L.L.C. (LLOG) has the capability to respond to the appropriate worst-case spill scenario included in its regional OSRP approved on July 21, 2020 and since the worst case discharge determined for our Supplemental Development Operations Coordination Document does not replace the appropriate worst-case scenario in our regional OSRP, I hereby certify that LLOG Exploration Offshore, L.L.C. has the capability to respond, to the maximum extent practicable, to a worst-case

discharge, or a substantial threat of such a discharge, resulting from the activities proposed in our Supplemental Development Operations Coordination Document.

The WCD for the subject plan does not exceed the worst case discharge previously submitted for MC 547 (Plan N-9951). LLOG Exploration Offshore, L.L.C., Company No. 02058, previously submitted the Regional OSRP Production WCD volume to be reviewed in Plan N-9551, Initial DOCD approved on May 23, 2011.

E. Oil Spill Response Discussion

See the following Oil Spill Response Discussion.

SPILL RESPONSE DISCUSSION

For the purpose of NEPA and Coastal Zone Management Act analysis, the largest spill volume originating from the proposed activity would be a well blowout during workover operations, estimated to be 109,127 barrels of crude oil with an API gravity of 28°.

Land Segment and Resource Identification

Trajectories of a spill and the probability of it impacting a land segment have been projected utilizing information in the BOEM Oil Spill Risk Analysis Model (OSRAM) for the Central and Western Gulf of Mexico available on the BOEM website. The results are shown in **Figure 1**. The BOEM OSRAM identifies an 8% probability of impact to the shorelines of Plaquemines Parish, Louisiana within 30 days. Plaquemines Parish includes Barataria Bay, the Mississippi River Delta, Breton Sound and the affiliated islands and bays. This region is an extremely sensitive habitat and serves as a migratory, breeding, feeding and nursery habitat for numerous species of wildlife. Beaches in this area vary in grain particle size and can be classified as fine sand, shell or perched shell beaches. Sandy and muddy tidal flats are also abundant.

Response

LLOG will make every effort to respond to the Worst Case Discharge as effectively as practicable. A description of the response equipment under contract to contain and recover the Worst Case Discharge is shown in **Figure 2**.

Using the estimated chemical and physical characteristics of crude oil, an ADIOS weathering model was run on a similar product from the ADIOS oil database. The results indicate 18% or approximately 28,874 barrels of crude oil would be evaporated/dispersed within 24 hours, with approximately 131,538 barrels remaining.

Natural Weathering Data: MC 546 SS006 ST01	Barrels of Oil
WCD Volume	109,127
Less 18% natural evaporation/dispersion	19,643
Remaining volume	89,484

Figure 2 outlines equipment, personnel, materials and support vessels as well as temporary storage equipment available to respond to the worst case discharge. The volume accounts for the amount remaining after evaporation/dispersion at 24 hours. The list estimates individual

times needed for procurement, load out, travel time to the site and deployment. **Figure 2** also indicates how operations will be supported.

LLOG's Oil Spill Response Plan includes alternative response technologies such as dispersants and in-situ burn. Strategies will be decided by Unified Command based on an operations safety analysis, the size of the spill, weather and potential impacts. If aerial dispersants are utilized, 8 sorties (9,600 gallons) from two of the DC-3 aircrafts and 4 sorties (8,000 gallons) from the Basler aircraft would provide a daily dispersant capability of 7,540 barrels. If the conditions are favorable for in-situ burning, the proper approvals have been obtained and the proper planning is in place, in-situ burning of oil may be attempted. Slick containment boom would be immediately called out and on-scene as soon as possible. Offshore response strategies may include attempting to skim utilizing CGA's and MSRC's spill response equipment with a total derated skimming capacity of 502,535 barrels. Temporary storage associated with skimming equipment equals 148,447 barrels. If additional storage is needed, various tank barges with a total of 508,000+ barrels of storage capacity may be mobilized and centrally located to provide temporary storage and minimize off-loading time. **Safety is first priority. Air monitoring will be accomplished and operations deemed safe prior to any containment/skimming attempts.**

If the spill went unabated, shoreline impact in Plaquemines Parish, Louisiana would depend upon existing environmental conditions. Shoreline protection would include the use of CGA's and MSRC's near shore and shallow water skimmers with a totaled derated skimming capacity of 281,303 barrels. Temporary storage associated with skimming equipment equals 8,937 barrels. If additional storage is needed, various tank barges with a total of 373,000+ barrels of storage capacity may be mobilized and centrally located to provide temporary storage and minimize off-loading time. Onshore response may include the deployment of shoreline boom on beach areas, or protection and sorbent boom on vegetated areas. Contracts with OMI Environmental and MSRC will ensure access to 133,700 feet of 18" shoreline protection boom. **Figure 2** outlines individual times needed for procurement, load out, travel time to the site and deployment. Strategies would be based upon surveillance and real time trajectories that depict areas of potential impact given actual sea and weather conditions. Applicable Area Contingency Plans (ACPs), Geographic Response Plans (GRPs), and Unified Command (UC) will be consulted to ensure that environmental and special economic resources are correctly identified and prioritized to ensure optimal protection. Shoreline protection strategies depict the protection response modes applicable for oil spill clean-up operations. As a secondary resource, the State of Louisiana Initial Oil Spill Response Plan will be consulted as appropriate to provide detailed shoreline protection strategies and describe necessary action to keep the oil spill from entering Louisiana's coastal wetlands. The UC should take into consideration all appropriate items detailed in Tactics discussion of this Appendix. The UC and their personnel have the option to

modify the deployment and operation of equipment to allow for a more effective response to site-specific circumstances. LLOG's contract Incident Management Team has access to the applicable ACP(s) and GRP(s).

Based on the anticipated worst case discharge scenario, LLOG can be onsite with contracted oil spill recovery equipment with adequate response capacity to contain and recover surface hydrocarbons, and prevent land impact, to the maximum extent practicable, within an estimated 62 hours (based on the equipment's Effective Daily Recovery Capacity (EDRC)).

Initial Response Considerations

Actual actions taken during an oil spill response will be based on many factors to include but not be limited to:

- Safety
- Weather
- Equipment and materials availability
- Ocean currents and tides
- Location of the spill
- Product spilled
- Amount spilled
- Environmental risk assessments
- Trajectory and product analysis
- Well status, i.e., shut in or continual release

LLOG will take action to provide a safe, aggressive response to contain and recover as much of the spilled oil as quickly as it is safe to do so. In an effort to protect the environment, response actions will be designed to provide an “in-depth” protection strategy meant to recover as much oil as possible as far from environmentally sensitive areas as possible. Safety will take precedence over all other considerations during these operations.

Coordination of response assets will be supervised by the designation of a SIMOPS Group as necessary for close quarter vessel response activities. Most often, this group will be used during source control events that require a significant number of large vessels operating independently to complete a common objective, in close coordination and support of each other. This group must also monitor the subsurface activities of each vessel (ROV, dispersant application, well control support, etc.). The SIMOPS Group Supervisor reports to the Source Control Section Chief.

In addition, these activities will be monitored by the Incident Management Team (IMT) and Unified Command via a structured Common Operating Picture (COP) established to track resource and slick movement in real time.

Upon notification of a spill, the following actions will be taken:

- Information will be confirmed
- An assessment will be made and initial objectives set
- OSROs and appropriate agencies will be notified
- ICS 201, Initial Report Form completed
- Initial Safety plan will be written and published

- Unified Command will be established
 - Overall safety plan developed to reflect the operational situation and coordinated objectives
 - Areas of responsibility established for Source Control and each surface operational site
 - On-site command and control established

Offshore Response Actions

Equipment Deployment

Surveillance

- Surveillance Aircraft: within two hours of QI notification, or at first light
- Provide trained observer to provide on-site status reports
- Provide command and control platform at the site if needed
- Continual surveillance of oil movement by remote sensing systems, aerial photography and visual confirmation
- Continual monitoring of vessel assets using vessel monitoring systems

Dispersant application assets

- Put ASI on standby
- With the FOSC, conduct analysis to determine appropriateness of dispersant application (refer to Section 18)
- Gain FOSC approval for use of dispersants on the surface
- Deploy aircraft in accordance with a plan developed for the actual situation
- Coordinate movement of dispersants, aircraft, and support equipment and personnel
- Confirm dispersant availability for current and long range operations
- Start ordering dispersant stocks required for expected operations

Containment boom

- Call out early and expedite deployment to be on scene ASAP
- Ensure boom handling and mooring equipment is deployed with boom
- Provide continuing reports to vessels to expedite their arrival at sites that will provide for their most effective containment
- Use Vessels of Opportunity (VOO) to deploy and maintain boom

Oceangoing Boom Barge

- Containment at the source
- Increased/enhanced skimmer encounter rate
- Protection booming

In-situ Burn assets

- Determine appropriateness of in-situ burn operation in coordination with the FOSC and affected SOSC
- Determine availability of fire boom and selected ignition systems

- Start ordering fire boom stocks required for expected operations
- Contact boom manufacturer to provide training & tech support for operations, if required
- Determine assets to perform on water operation
- Build operations into safety plan
- Conduct operations in accordance with an approved plan
- Initial test burn to ensure effectiveness

Dedicated offshore skimming systems

General

- Deployed to the highest concentration of oil
- Assets deployed at safe distance from aerial dispersant and in-situ burn operations

CGA HOSS Barge

- Use in areas with heaviest oil concentrations
- Consider for use in areas of known debris (seaweed, and other floating materials)

CGA 95' Fast Response Vessels (FRVs)

- Designed to be a first vessel on scene
- Capable of maintaining the initial Command and Control function for on water recovery operations
- 24 hour oil spill detection capability
- Highly mobile and efficient skimming capability
- Use as far offshore as safely possible

CGA FRUs

- To the area of the thickest oil
- Use as far offshore as allowed
- VOOs 140' – 180' in length
- VOOs with minimum of 18' x 38' or 23' x 50' of optimum deck space
- VOOs in shallow water should have a draft of <10 feet when fully loaded

T&T Koseq Skimming Systems

- To the area of the thickest oil
- Use as far offshore as allowed
- VOOs with a minimum of 2,000 bbls storage capacity
- VOOs at least 200' in length

- VOOs with deck space of 100' x 40' to provide space for arms, tanks, and crane
- VOOs for shallow water should be deck barges with a draft of <10 feet when fully loaded

Storage Vessels

- Establish availability of CGA contracted assets (See Appendix E)
- Early call out (to allow for tugboat acquisition and deployment speeds)
- Phase mobilization to allow storage vessels to arrive at the same time as skimming systems
- Position as closely as possible to skimming assets to minimize offloading time

Vessels of Opportunity (VOO)

- Use LLOG's contracted resources as applicable
- Industry vessels are ideal for deployment of Vessel of Opportunity Skimming Systems (VOSS)
- Acquire additional resources as needed
- Consider use of local assets, i.e. fishing and pleasure craft for ISB operations or boom tending
- Expect mission specific and safety training to be required
- Plan with the US Coast Guard for vessel inspections
- Place VOOs in Division or Groups as needed
- Use organic on-board storage if appropriate
- Maximize non-organic storage appropriate to vessel limitations
- Decant as appropriate after approval to do so has been granted
- Assign bulk storage barges to each Division/Group
- Position bulk storage barges as close to skimming units as possible
- Utilize large skimming vessel (e.g. barges) storage for smaller vessel offloading
- Maximize skimming area (swath) to the optimum width given sea conditions and available equipment
- Maximize use of oleophilic skimmers in all operations, but especially offshore
- Nearshore, use shallow water barges and shuttle to skimming units to minimize offloading time
- Plan and equip to use all offloading capabilities of the storage vessel to minimize offloading time

Adverse Weather Operations:

In adverse weather, when seas are ≥ 3 feet, the use of larger recovery and storage vessels, oleophilic skimmers, and large offshore boom will be maximized. KOSEQ Arm systems are built for rough conditions, and they should be used until their operational limit (9.8' seas) is met. Safety will be the overriding factor in all operations and will cease at the order of the Unified Command, vessel captain, or in an emergency, "stop work" may be directed by any crew member.

Surface Oil Recovery Considerations and Tactics (Offshore and Near-shore Operations)

Maximization of skimmer-oil encounter rate

- Place barges in skimming task forces, groups, etc., to reduce recovered oil offloading time
- Place barges alongside skimming systems for immediate offloading of recovered oil when practicable
- Use two vessels, each with heavy sea boom, in an open-ended "V" configuration to funnel surface oil into a trailing skimming unit's organic, V-shaped boom and skimmer (see page 7, *CGA Equipment Guide Book and Tactic Manual* (CGATM))
- Use secondary vessels and heavy sea boom to widen boom swath beyond normal skimming system limits (see page 15, CGATM)
- Consider night-time operations, first considering safety issues
- Utilize all available advanced technology systems (IR, X-Band Radar, etc.) to determine the location of, and move to, recoverable oil
- Confirm the presence of recoverable oil prior to moving to a new location

Maximize skimmer system efficiency

- Place weir skimming systems in areas of calm seas and thick oil
- Maximize the use of oleophilic skimming systems in heavier seas
- Place less mobile, high EDRC skimming systems (e.g. HOSS Barge) in the largest pockets of the heaviest oil
- Maximize onboard recovered oil storage for vessels.
- Obtain authorization for decanting of recovered water as soon as possible
- Use smaller, more agile skimming systems to recover streamers of oil normally found farther from the source. Place recovered oil barges nearby

Recovered Oil Storage

- Smaller barges in larger quantities will increase flexibility for multi-location skimming operations
- Place barges in skimming task forces, groups, etc., to reduce recovered oil offloading time
- Procure and deploy the maximum number of portable tanks to support Vessel of Opportunity Skimming Systems if onboard storage is not available
- Maximize use of the organic recovered oil storage capacity of the skimming vessel

Command, Control, and Communications (C³)

- Publish, implement, and fully evaluate an appropriate communications plan
- Design an operational scheme, maintaining a manageable span of control
- Designate and mark C³ vessels for easy aerial identification
- Designate and employ C³ aircraft for task forces, groups, etc.
- Use reconnaissance aircraft and Rapid Response Teams (RAT) to confirm the presence of recoverable oil

On Water Recovery Group

When the first skimming vessel arrives on scene, a complete site assessment will be conducted before recovery operations begin. Once it is confirmed that the air monitoring readings for O₂, LEL, H₂S, CO, VOC, and Benzene are all within the permissible limits, oil recovery operations may begin.

As skimming vessels arrive, they will be organized to work in areas that allow for the most efficient vessel operation and free vessel movement in the recovery of oil. Vessel groups will vary in structure as determined by the Operations Section of the Unified Command, but will generally consist, at a minimum, of the following dedicated assets:

- 3 to 5 – Offshore skimming vessels (recovery)
- 1 – Tank barge (temporary storage)
- 1 – Air asset (tactical direction)
- 2 – Support vessels (crew/utility for supply)
- 6 to 10 – Boom vessels (enhanced booming)

Example (Note: Actual organization of TFs will be dependent on several factors including, asset availability, weather, spilled oil migration, currents, etc.)

The 95' FRV Breton Island out of Venice arrives on scene and conducts an initial site assessment. Air monitoring levels are acceptable and no other visual threats have been observed. The area is cleared for safe skimming operations. The Breton Island assumes command and control (CoC) of on-water recovery operations until a dedicated non-skimming vessel arrives to relieve it of those duties.

A second 95' FRV arrives and begins recovery operations alongside the Breton Island. Several more vessels begin to arrive, including a third 95' FRV out of Galveston, the HOSS Barge (High Volume Open Sea Skimming System) out of Harvey, a boom barge (CGA 300) with 25,000' of 42" auto boom out of Leeville, and 9 Fast Response Units (FRUs) from the load-out location at C-Port in Port Fourchon.

As these vessels set up and begin skimming, they are grouped into task forces (TFs) as directed by the Operations Section of the Unified Command located at the command post.

Initial set-up and potential actions:

- A 1,000 meter safety zone has been established around the incident location for vessels involved in Source Control
- The HOSS Barge is positioned facing the incident location just outside of this safety zone or at the point where the freshest oil is reaching the surface
- The HOSS Barge engages its Oil Spill Detection (OSD) system to locate the heaviest oil and maintains that ability for 24-hour operations
- The HOSS Barge deploys 1,320' of 67" Sea Sentry boom on each side, creating a swath width of 800'
- The Breton Island and H.I. Rich skim nearby, utilizing the same OSD systems as the HOSS Barge to locate and recover oil
- Two FRUs join this group and it becomes TF1
- The remaining 7 FRUs are split into a 2 and 3 vessel task force numbered TF2 and TF3
- A 95' FRV is placed in each TF
- The boom barge (CGA 300) is positioned nearby and begins deploying auto boom in sections between two utility vessels (1,000' to 3,000' of boom, depending on conditions) with chain-link gates in the middle to funnel oil to the skimmers
- The initial boom support vessels position in front of TF2 and TF3
- A 100,000+ barrel offshore tank barge is placed with each task force as necessary to facilitate the immediate offload of skimming vessels

The initial task forces (36 hours in) may be structured as follows:

TF 1

- 1 – 95' FRV
- 1 – HOSS Barge with 3 tugs
- 2 – FRUs
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 8 – 500' sections of auto boom with gates
- 8 – Boom-towing vessels
- 2 – Support vessels (crew/utility)

TF 2

- 1 – 95' FRV
- 4 – FRUs
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 10 – 500' sections of auto boom with gates

- 10 – Boom-towing vessels
- 2 – Support vessels (crew/utility)

TF 3

- 1 – 95' FRV
- 3 – FRUs
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 8 – 500' sections of auto boom with gates
- 8 – Boom-towing vessels
- 2 – Support vessels (crew/utility)

Offshore skimming equipment continues to arrive in accordance with the ETA data listed in figure H.3a; this equipment includes 2 AquaGuard skimmers and 11 sets of Koseq Rigid Skimming Arms. These high volume heavy weather capable systems will be divided into functional groups and assigned to specific areas by the Operations Section of the Unified Command.

At this point of the response, the additional TFs may assume the following configurations:

TF 4

- 2 – Sets of Koseq Rigid Skimming Arms w/ associated 200'+ PIDVs
- 1 – AquaGuard Skimmer
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 2 – Support vessels (crew/utility)
- 6 – 500' sections of auto boom with gates
- 6 – Boom-towing vessels

TF 5

- 3 – Sets of Koseq Rigid Skimming Arms w/ associated 200'+ PIDVs
- 1 – AquaGuard Skimmer
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 2 – Support vessels (crew/utility)
- 8 – 500' sections of auto boom with gates
- 8 – Boom-towing vessels

TF 6

- 3 – Sets of Koseq Rigid Skimming Arms w/ associated 200'+ PIDVs
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 2 – Support vessels (crew/utility)
- 6 – 500' sections of auto boom with gates
- 6 – Boom-towing vessels

TF 7

- 3 – Sets of Koseq Rigid Skimming Arms w/ associated 200'+ PIDVs
- 1 – 100,000+ barrel tank barge and associated tug(s)
- 1 – Dedicated air asset for tactical direction
- 2 – Support vessels (crew/utility)
- 6 – 500' sections of auto boom with gates
- 6 – Boom-towing vessels

CGA Minimum Acceptable Capabilities for Vessels of Opportunity (VOO)

Minimum acceptable capabilities of Petroleum Industry Designed Vessels (PIDV) for conducting Vessel of Opportunity (VOO) skimming operations are shown in the table below. PIDVs are “purpose-built” to provide normal support to offshore oil and gas operators. They include but are not limited to utility boats, offshore supply vessels, etc. They become VOOs when tasked with oil spill response duties.

Capability	FRU	KOSEQ	AquaGuard
Type of Vessel	Utility Boat	Offshore Supply Vessel	Utility Boat
Operating parameters			
Sea State	3-5 ft max	9.8 ft max	3-5 ft max
Skimming speed	≤1 kt	≤3 kts	≤1 kt
Vessel size			
Minimum Length	100 ft	200 ft	100 ft
Deck space for: • Tank(s) • Crane(s) • Boom Reels • Hydraulic Power Units • Equipment Boxes	18x32 ft	100x40 ft	18x32 ft
Communication Assets	Marine Band Radio	Marine Band Radio	Marine Band Radio

Tactical use of Vessels of Opportunity (VOO): LLOG will take all possible measures to maximize the oil-to-skimmer encounter rate of all skimming systems, to include VOOs, as discussed in this section. VOOs will normally be placed within an On-water recovery unit as shown in figures below.

Skimming Operations: PIDVs are the preferred VOO skimming platform. OSROs are more versed in operating on these platforms and the vessels are generally large enough with crews more likely versed in spill response operations. They also have a greater possibility of having on-board storage capacity and the most likely vessels to be under contract, and therefore more readily available to the operator. These vessels would normally be assigned to an on-water recovery group/division (see figure below) and outfitted with a VOSS suited for their size and capabilities. Specific tactics used for skimming operations would be dependent upon many parameters which include, but are not limited to, safety concerns, weather, type VOSS on board, product being recovered, and area of oil coverage. Planners would deploy these assets

with the objective of safely maximizing oil- to-skimmer encounter rate by taking actions to minimize non-skimming time and maximizing boom swath. Specific tactical configurations are shown in figures below.

The Fast Response Unit (FRU): A self-contained, skid based, skimming system that is deployed from the right side of a vessel of opportunity (VOO). An outrigger holds a 75' long section of air inflatable boom in place that directs oil to an apex for recovery via a Foilex 250 weir skimmer. The outrigger creates roughly a 40' swath width dependent on the VOO beam. The lip of the collection bowl on the skimmer is placed as close to the oil and water interface as possible to maximize oil recovery and minimize water retention. The skimmer then pumps all fluids recovered to the storage tank where it is allowed to settle, and with the approval of the Coast Guard, the water is decanted from the bottom of the tank back into the water ahead of the containment boom to be recycled through the system. Once the tank is full of as much pure recovered oil as possible it is offloaded to a storage barge for disposal in accordance with an approved disposal plan. A second 100 barrel storage tank can be added if the appropriate amount of deck space is available to use as secondary storage.

Tactical Overview

Mechanical Recovery – The FRU is designed to provide fast response skimming capability in the offshore and nearshore environment in a stationary or advancing mode. It provides a rated daily recovery capacity of 4,100 barrels. An additional boom reel with 440' of offshore boom can be deployed along with the FRU, and a second support vessel for boom towing, to extend the swath width when attached to the end of the fixed boom. The range and sustainability offshore are dependent on the VOO that the unit is placed on, but generally these can stay offshore for extended periods. The FRU works well independently or assigned with other on-water recovery assets in a task force. In either case, it is most effective when a designated aircraft is assigned to provide tactical direction to ensure the best placement in recoverable oil.

Maximum Sea Conditions – Under most circumstances the FRU can maintain standard oil spill recovery operations in 2' to 4' seas. Ultimately, the Coast Guard licensed Captain in charge of the VOO (with input from the CGAS Supervisor assigned) will be responsible to determine when the sea conditions have surpassed the vessel's safe operating capabilities.

Possible Task Force Configuration (Multiple VOOs can be deployed in a task force)

- 1 – VOO (100' to 165' Utility or Supply Vessel)
- 1 – Boom reel w/support vessel for towing
- 1 – Tank barge (offshore) for temporary storage
- 1 – Utility/Crewboat (supply)

1 – Designated spotter aircraft



The VOSS (yellow) is being deployed and connected to an out-rigged arm. This is suitable for collection in both large pockets of oil and for recovery of streaming oil. The oil-to-skimmer encounter rate is limited by the length of the arm. Skimming pace is ≤ 1 knot.



Through the use of an additional VOO, and using extended sea boom, the swath of the VOSS is increased therefore maximizing the oil-to-skimmer encounter rate. Skimming pace is ≤ 1 knot.

The Koseq Rigid Sweeping Arm: A skimming system deployed on a vessel of opportunity. It requires a large Offshore or Platform Supply Vessel (OSV/PSV), greater than 200' with at least 100' x 50' of free deck space. On each side of the vessel, a 50' long rigid framed Arm is deployed that consists of pontoon chambers to provide buoyancy, a smooth nylon face, and a hydraulically adjustable mounted weir skimmer. The Arm floats independently of the vessel and is attached by a tow bridle and a lead line. The movement of the vessel forward draws the rubber end seal of the arm against the hull to create a collection point for free oil directed to the weir by the Arm face. The collection weir is adjusted to keep the lip as close to the oil water interface as possible to maximize oil recovery while attempting to minimize excess water collection. A transfer pump (combination of positive displacement, screw type and centrifuge suited for highly viscous oils) pump the recovered liquid to portable tanks and/or dedicated fixed storage tanks onboard the vessel. After being allowed to sit and separate, with approval from the Coast Guard, the water can be decanted (pumped off) in front of the collection arm to be reprocessed through the system. Once full with as much pure recovered oil as possible, the oil is transferred to a temporary storage barge where it can be disposed of in accordance with an approved disposal plan.

Tactical Overview

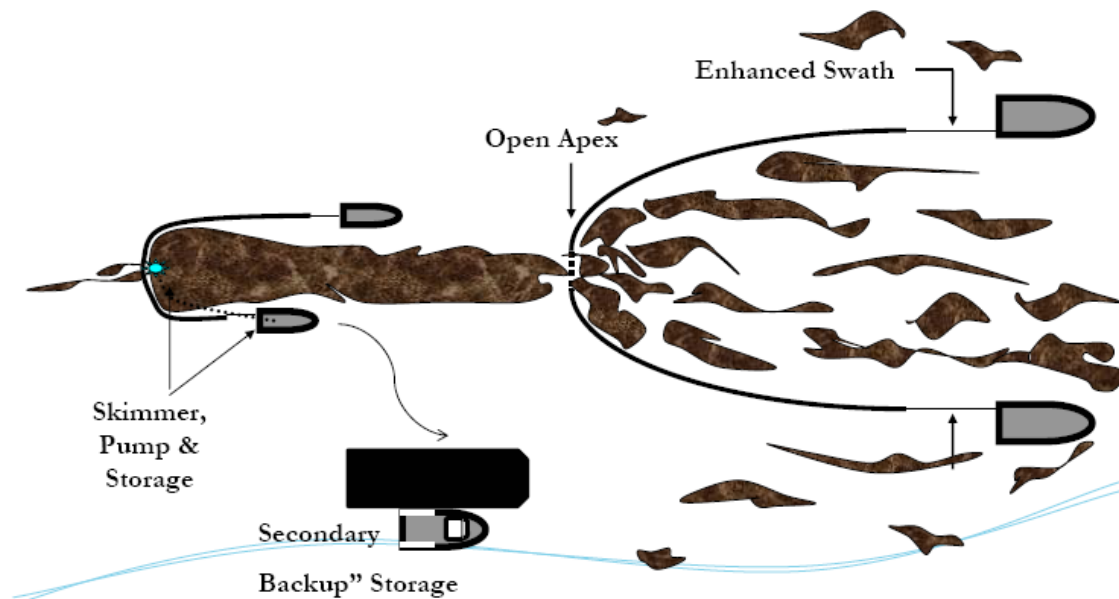
Mechanical Recovery – Deployed on large vessels of opportunity (VOO) the Koseq Rigid Sweeping Arms are high volume surge capacity deployed to increase recovery capacity at the source of a large oil spill in the offshore and outer nearshore environment of the Gulf of Mexico. They are highly mobile and sustainable in rougher sea conditions than normal skimming vessels (9.8' seas). The large Offshore Supply Vessels (OSV) required to deploy the Arms are able to remain on scene for extended periods, even when sea conditions pick up. Temporary storage on deck in portable tanks usually provides between 1,000 and 3,000 bbls. In most cases, the OSV will be able to pump 20% of its deadweight into the liquid mud tanks in accordance with the vessels Certificate of Inspection (COI). All storage can be offloaded utilizing the vessels liquid transfer system.

Maximum Sea Conditions - Under most circumstances the larger OSVs are capable of remaining on scene well past the Skimming Arms maximum sea state of 9.8'. Ultimately it will be the decision of the VOO Captain, with input from the T&T Supervisor onboard, to determine when the sea conditions have exceeded the safe operating conditions of the vessel.

Command and Control – The large OSVs in many cases have state of the art communication and electronic systems, as well as the accommodations to support the function of directing all skimming operations offshore and reporting back to the command post.

Possible Task Force Configuration (Multiple Koseq VOOs can be deployed in a task force)

- 1 – $\geq 200'$ Offshore Supply Vessels (OSV) with set of Koseq Arms
- 2 to 4 portable storage tanks (500 bbl)
- 1 – Modular Crane Pedestal System set (MCPS) or 30 cherry picker (crane) for deployment
- 1 – Tank barge (offshore) for temporary storage
- 1 – Utility/Crewboat (supply)
- 1 – Designated spotter aircraft
- 4 – Personnel (4 T&T OSRO)



Scattered oil is “caught” by two VOO and collected at the apex of the towed sea boom. The oil moves through a “gate” at that apex, forming a larger stream of oil which moves into the boom of the skimming vessel. Operations are paced at >1 . A recovered oil barge stationed nearby to minimize time taken to offload recovered oil.





This is a depiction of the same operation as above but using KOSEQ Arms. In this configuration, the collecting boom speed dictates the operational pace at ≥ 1 knot to minimize entrainment of the oil.

Clean Gulf Associates (CGA) Procedure for Accessing Member-Contracted and other Vessels of Opportunity (VOOs) for Spill Response

- CGA has procedures in place for CGA member companies to acquire vessels of opportunity (VOOs) from an existing CGA member's contracted fleet or other sources for the deployment of CGA portable skimming equipment including Koseq Arms, Fast Response Units (FRUs) and any other portable skimming system(s) deemed appropriate for the response for a potential or actual oil spill, WCD oil spill or a Spill of National Significance (SONS).
- CGA uses Port Vision, a web-based vessel and terminal interface that empowers CGA to track vessels through Automatic Identification System (AIS) and terminal activities using a Geographic Information System (GIS). It provides live AIS/GIS views of waterways showing current vessel positions, terminals, created vessel fleets, and points-of-interest. Through this system, CGA has the ability to get instant snapshots of the location and status of all vessels contracted to CGA members, day or night, from any web-enabled PC.

Near Shore Response Actions

Timing

- Put near shore assets on standby and deployment in accordance with planning based on the actual situation, actual trajectories and oil budgets
- VOO identification and training in advance of spill nearing shoreline if possible
- Outfitting of VOOs for specific missions
- Deployment of assets based on actual movement of oil

Considerations

- Water depth, vessel draft
- Shoreline gradient
- State of the oil
- Use of VOOs
- Distance of surf zone from shoreline

Surveillance

- Provide trained observer to direct skimming operations
- Continual surveillance of oil movement by remote sensing systems, aerial photography and visual confirmation
- Continual monitoring of vessel assets

Dispersant Use

- Generally will not be approved within 3 miles of shore or with less than 10 meters of water depth
- Approval would be at Regional Response Team level (Region 6)

Dedicated Near Shore skimming systems

- FRVs
- Egmpol and Marco SWS
- Operate with aerial spotter directing systems to observed oil slicks

VOO

- Use LLOG's contracted resources as applicable
- Industry vessel are usually best for deployment of Vessel of Opportunity Skimming Systems (VOSS)
- Acquire additional resources as needed

- Consider use of local assets, i.e. fishing and pleasure craft
- Expect mission specific and safety training to be required
- Plan with the US Coast Guard for vessel inspections
- Operate with aerial spotter directing systems to oil patches

Shoreline Protection Operations

Response Planning Considerations

- Review appropriate Area Contingency Plan(s)
- Locate and review appropriate Geographic Response and Site Specific Plans
- Refer to appropriate Environmentally Sensitive Area Maps
- Capability for continual analysis of trajectories run periodically during the response
- Environmental risk assessments (ERA) to determine priorities for area protection
- Time to acquire personnel and equipment and their availability
- Refer to the State of Louisiana Initial Oil Spill Response Plan, Deep Water Horizon, dated 2 May 2010, as a secondary reference
- Aerial surveillance of oil movement
- Pre-impact beach cleaning and debris removal
- Shoreline Cleanup Assessment Team (SCAT) operations and reporting procedures
- Boom type, size and length requirements and availability
- Possibility of need for In-situ burning in near shore areas
- Current wildlife situation, especially status of migratory birds and endangered species in the area
- Check for Archeological sites and arrange assistance for the appropriate state agency when planning operations that may impact these areas

Placement of boom

- Position boom in accordance with the information gained from references listed above and based on the actual situation
- Determine areas of natural collection and develop booming strategies to move oil into those areas
- Assess timing of boom placement based on the most current trajectory analysis and the availability of each type of boom needed. Determine an overall booming priority and conduct booming operations accordingly. Consider:
 - Trajectories
 - Weather forecast
 - Oil Impact forecast
 - Verified spill movement
 - Boom, manpower and vessel (shallow draft) availability
 - Near shore boom and support material, (stakes, anchors, line)

Beach Preparation - Considerations and Actions

- Use of a 10 mile go/no go line to determine timing of beach cleaning
- SCAT reports and recommendations
- Determination of archeological sites and gaining authority to enter
- Monitoring of tide tables and weather to determine extent of high tides
- Pre cleaning of beaches by moving waste above high tide lines to minimize waste
- Determination of logistical requirements and arranging of waste removal and disposal
- Staging of equipment and housing of response personnel as close to the job site as possible to maximize on-site work time
- Boom tending, repair, replacement and security (use of local assets may be advantageous)
- Constant awareness of weather and oil movement for resource re-deployment as necessary
- Earthen berms and shoreline protection boom may be considered to protect sensitive inland areas
- Requisitioning of earth moving equipment
- Plan for efficient and safe use of personnel, ensuring:
 - A continual supply of the proper Personal Protective Equipment
 - Heating or cooling areas when needed
 - Medical coverage
 - Command and control systems (i.e. communications)
 - Personnel accountability measures
- Remediation requirements, i.e., replacement of sands, rip rap, etc.
- Availability of surface washing agents and associated protocol requirements for their use (see National Contingency Plan Product Schedule for list of possible agents)
- Discussions with all stakeholders, i.e., landowners, refuge/park managers, and others as appropriate, covering the following:
 - Access to areas
 - Possible response measures and impact of property and ongoing operations
 - Determination of any specific safety concerns
 - Any special requirements or prohibitions
 - Area security requirements
 - Handling of waste
 - Remediation expectations
 - Vehicle traffic control
 - Domestic animal safety concerns
 - Wildlife or exotic game concerns/issues

Inland and Coastal Marsh Protection and Response

Considerations and Actions

- All considered response methods will be weighed against the possible damage they may do to the marsh. Methods will be approved by the Unified Command only after discussions with local Stakeholder, as identified above.
 - In-situ burn may be considered when marshes have been impacted
- Passive cleanup of marshes should be considered and appropriate stocks of sorbent boom and/or sweep obtained.
- Response personnel must be briefed on methods to traverse the marsh, i.e.,
 - use of appropriate vessel
 - use of temporary walkways or roadways
- Discuss and gain approval prior cutting or moving vessels through vegetation
- Discuss use of vessels that may disturb wildlife, i.e, airboats
- Safe movement of vessels through narrow cuts and blind curves
- Consider the possibility that no response in a marsh may be best
- In the deployment of any response asset, actions will be taken to ensure the safest, most efficient operations possible. This includes, but is not limited to:
 - Placement of recovered oil or waste storage as near to vessels or beach cleanup crews as possible.
 - Planning for stockage of high use items for expeditious replacement
 - Housing of personnel as close to the work site as possible to minimize travel time
 - Use of shallow water craft
 - Use of communication systems appropriate ensure command and control of assets
 - Use of appropriate boom in areas that I can offer effective protection
 - Planning of waste collection and removal to maximize cleanup efficiency
- Consideration or on-site remediation of contaminated soils to minimize replacement operations and impact on the area

Decanting Strategy

Recovered oil and water mixtures will typically separate into distinct phases when left in a quiescent state. When separation occurs, the relatively clean water phase can be siphoned or decanted back to the recovery point with minimal, if any, impact. Decanting therefore increases the effective on-site oil storage capacity and equipment operating time. FOSC/SOSC approval will be requested prior to decanting operations. This practice is routinely used for oil spill recovery.

CGA Equipment Limitations

The capability for any spill response equipment, whether a dedicated or portable system, to operate in differing weather conditions will be directly in relation to the capabilities of the vessel the system is placed on. Most importantly, however, the decision to operate will be based on the judgment of the Unified Command and/or the Captain of the vessel, who will ultimately have the final say in terminating operations. Skimming equipment listed below may have operational limits which exceed those safety thresholds. As was seen in the Deepwater Horizon (DWH) oil spill response, vessel skimming operations ceased when seas reached 5-6 feet and vessels were often recalled to port when those conditions were exceeded. Systems below are some of the most up-to-date systems available and were employed during the DWH spill.

Boom	3 foot seas, 20 knot winds
Dispersants	Winds more than 25 knots Visibility less than 3 nautical miles Ceiling less than 1,000 feet.
FRU	8 foot seas
HOSS Barge/OSRB	8 foot seas
Koseq Arms	8 foot seas
OSRV	4 foot seas

Environmental Conditions in the GOM

Louisiana is situated between the easterly and westerly wind belts, and therefore, experiences westerly winds during the winter and easterly winds in the summer. Average wind speed is generally 14-15 mph along the coast. Wave heights average 4 and 5 feet. However, during hurricane season, Louisiana has recorded wave heights ranging from 40 to 50 feet high and winds reaching speeds of 100 mph. Because much of southern Louisiana lies below sea level, flooding is prominent.

Surface water temperature ranges between 70 and 80°F during the summer months. During the winter, the average temperature will range from 50 and 60°F.

The Atlantic and Gulf of Mexico hurricane season is officially from 1 June to 30 November. 97% of all tropical activity occurs within this window. The Atlantic basin shows a very peaked season from August through October, with 78% of the tropical storm days, 87% of the minor (Saffir-Simpson Scale categories 1 and 2) hurricane days, and 96% of the major (Saffir-Simpson categories 3, 4 and 5) hurricane days occurring then. Maximum activity is in early to mid September. Once in a few years there may be a hurricane occurring "out of season" - primarily in May or December. Globally, September is the most active month and May is the least active month.

FIGURE 1
TRAJECTORY BY LAND SEGMENT

Trajectory of a spill and the probability of it impacting a land segment have been projected utilizing LLOG's WCD and information in the BOEM Oil Spill Risk Analysis Model (OSRAM) for the Central and Western Gulf of Mexico available on the BOEM website using 30 day impact. The results are tabulated below.				
Area/Block	OCS-G	Launch Area	Land Segment and/or Resource	Conditional Probability (%)
Well Location MC 546 (SL) MC 546 SS006 ST01, Well Location <i>38 miles from shore</i>	G25098	C58	Galveston, TX Jefferson, TX Cameron, LA Vermilion, LA Iberia, LA Terrebonne, LA Lafourche, LA Jefferson, LA Plaquemines, LA St. Bernard, LA Okaloosa, FL	1 1 3 2 1 3 3 1 8 1 1

WCD Scenario– BASED ON WELL BLOWOUT DURING DRILLING OPERATIONS (38 miles from shore) 89,464 bbls of crude oil (Volume considering natural weathering)
API Gravity 28°

FIGURE 2 – Equipment Response Time to MC 546, Well Location SS007

Dispersants/Surveillance

Dispersant/Surveillance	Dispersant Capacity (gal)	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to site	Total Hrs
ASI							
Basler 67T	2000	2	Houma	2	2	0.6	4.8
DC 3	1200	2	Houma	2	2	0.8	5.1
Aero Commander	NA	2	Houma	2	2	0.6	4.8
MSRC							
737-500	4,125	4	Weyers Cave	4	0	1.8	5.8

Offshore Response

Offshore Equipment Pre-Determined Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
CGA											
HOSS Barge	76285	4000	3 Tugs	8	Harvey	6	0	10	8	2	26
95' FRV	22885	249	NA	6	Leeville	2	0	2	2	1	7
95' FRV	22885	249	NA	6	Venice	2	0	2	2	1	7
95' FRV	22885	249	NA	6	Vermilion	2	0	2	7	1	12
Boom Barge (CGA-300) 42" Auto Boom (25000')	NA	NA	1 Tug 50 Crew	4 (Barge) 2 (Per Crew)	Leeville	8	0	4	8	2	22

Recovered Oil Storage Pre-Determined Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
Enterprise Marine Services LLC (Available through contract with CGA)											
CTCo 2603	NA	25000	1 Tug	6	Amelia	31	0	6	10	1	48
CTCo 2604	NA	20000	1 Tug	6	Amelia	31	0	6	10	1	48
CTCo 2605	NA	20000	1 Tug	6	Amelia	31	0	6	10	1	48
CTCo 2606	NA	20000	1 Tug	6	Amelia	31	0	6	10	1	48
CTCo 2607	NA	23000	1 Tug	6	Amelia	31	0	6	10	1	48

Recovered Oil Storage Pre-Determined Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
Kirby Offshore (available through contract with CGA)											
RO Barge	NA	80000+	1 Tug	6	Venice	45	0	4	10	1	60
RO Barge	NA	80000+	1 Tug	6	Venice	45	0	4	10	1	60
RO Barge	NA	80000+	1 Tug	6	Venice	45	0	4	10	1	60
RO Barge	NA	160000+	1 Tug	6	Venice	45	0	4	10	1	60

Offshore Equipment Pre-determined Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
MSRC											
Louisiana Responder 1 Transrec 3502,640' 67" <i>Curtain Pressure Boom</i>	10567	4000	NA	10	Fort Jackson, LA	2	1	4	5	1	13
MSRC 452 Offshore Barge 1 Crucial Disk 88/302,640' 67" <i>Curtain Pressure Boom</i>	11122	45000	3 Tugs	9	Fort Jackson, LA	4	1	6	8	1	20
Mississippi Responder 1 Transrec 350 2,640' 67" <i>Curtain Pressure Boom</i>	10567	4000	NA	10	Pascagoula, MS	2	1	2	10	1	16
MSRC 402 Offshore Barge 1 Crucial Disk 88/30 2,640' 67" <i>Curtain Pressure Boom</i>	11122	40300	3 Tugs	9	Pascagoula, MS	4	1	3	14	1	23
S.T. Benz Responder 1 LFF 100 Brush 2,640' 67" <i>Curtain Pressure Boom</i>	18086	4000	NA	10	Grand Isle, LA	3	1	1	3	1	9

Staging Area: Venice

Offshore Equipment With Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Site	Hrs to Deploy	Total Hrs
T&T Marine (available through direct contract with CGA)											
Koseq Skimming Arms (2) Lamor brush	45770	12000	2 OSV	12	Harvey	24	24	2	10	2	62
Koseq Skimming Arms (4) MariFlex 150 HF	72652	24000	4 OSV	24	Harvey	24	24	2	10	2	62
CGA											
FRU (2) + 100 bbl Tank (4)	8502	400	2 Utility	12	Vermilion	2	5	7	5	1	20
FRU (3) + 100 bbl Tank (6)	12753	600	3 Utility	18	Leeville	2	5	4.5	5	1	17.5
FRU (2) + 100 bbl Tank (4)	8502	400	2 Utility	12	Venice	2	5	2	5	1	15

Staging Area: Venice

Offshore Equipment Preferred Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Site	Hrs to Deploy	Total Hrs
MSRC											
GT-185 Skimmer w Adaptor (2)	2742	1000	2 Utility	10	Lake Charles	1	2	8	5	1	17
Stress I Skimmer (2)	31680	1000	2 Utility	10	Lake Charles	1	2	8	5	1	17
LFF 100 Brush Skimmer (1) <i>1,320' 67" Curtain Pressure Boom</i>	18086	1000	1 PSV	9	Lake Charles	1	2	8	5	1	17
LFF 100 Brush Skimmer (1) <i>1,320' 67" Curtain Pressure Boom</i>	18086	1000	1 PSV	9	Lake Charles	1	2	8	5	1	17
Stress I Skimmer (1)	15840	500	1 Utility	5	Grand Isle	1	2	5	5	1	14
LFF 100 Brush Skimmer (1) <i>1,320' 67" Curtain Pressure Boom</i>	18086	1000	1 PSV	9	Houma	1	2	3.5	5	1	12.5
Foilex 250 Skimmer (1)	3977	500	1 Utility	5	Belle Chasse	1	2	2	5	1	11
Stress I Skimmer (1)	15840	500	1 Utility	5	Fort Jackson	1	2	0.5	5	1	9.5
Crucial Disk 88/30 Skimmer (1) <i>1,320' 67" Curtain Pressure Boom</i>	11122	1000	1 PSV	9	Fort Jackson	1	2	0.5	5	1	9.5

GT-185 Skimmer (1)	1371	500	1 Utility	5	Pascagoula	1	2	5.5	5	1	14.5
Crucial Disk 88/30 Skimmer (1)	11122	1000	1 PSV	9	Pascagoula	1	2	5.5	5	1	14.5

Staging Area: Venice

Offshore Equipment Preferred Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Site	Hrs to Deploy	Total Hrs
CGA											
Hydro-Fire Boom	NA	NA	8 Utility	40	Harvey	0	24	2	5	6	37
MSRC											
67" Curtain Pressure Boom	NA	NA	80*	160	Houston	1	2	12	5	1	21
1000' Fire Resistant Boom	NA	NA	3*	6	Galveston	1	4	13	5	6	29
16000' Fire Resistant Boom	NA	NA	3*	6	Houston	1	4	12	5	6	28
2000' Hydro Fire Boom	NA	NA	8*	8	Lake Charles	1	4	8	5	6	24

* Utility Boats, Crew Boats, Supply Boats, or Fishing Vessels

Nearshore Response

Nearshore Equipment Pre-determined Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
CGA											
Mid-Ship SWS	22885	249	NA	4	Leeville	2	0	N/A	48	1	51
Mid-Ship SWS	22885	249	NA	4	Venice	2	0	N/A	48	1	51
Mid-Ship SWS	22885	249	NA	4	Galveston	2	0	N/A	48	1	51
Trinity SWS	21500	249	NA	4	Leeville	2	0	N/A	48	1	51
Trinity SWS	21500	249	NA	4	Lake Charles	2	0	N/A	48	1	51
Trinity SWS	21500	249	NA	4	Vermilion	2	0	N/A	48	1	51
Trinity SWS	21500	249	NA	4	Galveston	2	0	N/A	48	1	51
46' FRV	15257	65	NA	4	Aransas Pass	2	0	2	19	1	24
46' FRV	15257	65	NA	4	Leeville	2	0	2	2	1	7
46' FRV	15257	65	NA	4	Lake Charles	2	0	2	10	1	15
46' FRV	15257	65	NA	4	Venice	2	0	2	2	1	7
Enterprise Marine Services LLC (Available through contract with CGA)											
CTCo 2608	NA	23000	1 Tug	6	Amelia	25	0	6	16	1	48
CTCo 2609	NA	23000	1 Tug	6	Amelia	25	0	6	16	1	48
CTCo 5001	NA	47000	1 Tug	6	Amelia	25	0	6	16	1	48

Recovered Oil Storage Pre- Determined Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
Kirby Offshore (available through contract with CGA)											
RO Barge	NA	80000+	1 Tug	6	Venice	45	0	4	10	1	60
RO Barge	NA	100000+	1 Tug	6	Venice	45	0	4	10	1	60
RO Barge	NA	100000+	1 Tug	6	Venice	45	0	4	10	1	60

Staging Area: Venice

Nearshore Equipment With Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Load Out	Travel to Staging	Travel to Deployment	Hrs to Deploy	Total Hrs
CGA											
SWS Egmpol	1810	100	NA	3	Galveston	2	2	13	2	1	20
SWS Egmpol	1810	100	NA	3	Leeville	2	2	4.5	2	1	11.5
SWS Marco	3588	20	NA	3	Vermilion	2	2	8	2	1	15
SWS Marco	3588	34	NA	3	Leeville	2	2	4.5	2	1	11.5
SWS Marco	3588	34	NA	3	Venice	2	2	2	2	1	9
Foilex Skim Package (TDS 150)	1131	50	NA	3	Vermilion	4	12	8	2	2	28
Foilex Skim Package (TDS 150)	1131	50	NA	3	Galveston	4	12	13	2	2	33
Foilex Skim Package (TDS 150)	1131	50	NA	3	Harvey	4	12	2	2	2	22
4 Drum Skimmer (Magnum	680	100	1 Crew	3	Vermilion	2	2	8	2	1	15
4 Drum Skimmer (Magnum	680	100	1 Crew	3	Harvey	2	2	2	2	1	9
2 Drum Skimmer (TDS 118)	240	100	1 Crew	3	Vermilion	2	2	8	2	1	15
2 Drum Skimmer (TDS 118)	240	100	1 Crew	3	Harvey	2	2	2	2	1	9
MSRC											
30 ft. Kvichak <i>Marco I Skimmer</i>	3588	24	NA	2	Ingleside	1	1	18	2	1	23
30 ft. Kvichak <i>Marco I Skimmer</i>	3588	24	NA	2	Galveston	1	1	13	2	1	18
30 ft. Kvichak <i>Marco I Skimmer</i>	3588	24	NA	2	Belle Chasse	1	1	2	2	1	7
30 ft. Kvichak <i>Marco I Skimmer</i>	3588	24	NA	2	Pascagoula	1	1	5.5	2	1	10.5
AardVac Skimmer (1)	3840	400	1 Utility	4	Lake Charles	1	1	8	2	1	13
AardVac Skimmer (1)	3840	400	1 Utility	4	Pascagoula	1	1	5.5	2	1	10.5
AardVac Skimmer (2)	7680	800	2 Utility	8	Miami	1	1	27	2	1	32
Queensboro Skimmer (1)	905	400	1 Utility	4	Galveston	1	1	13	2	1	18
Queensboro Skimmer (5)	4525	2000	5 Utility	20	Lake Charles	1	1	8	2	1	13
Queensboro Skimmer (1)	905	400	1 Utility	4	Belle Chasse	1	1	2	2	1	7
Queensboro Skimmer (1)	905	400	1 Utility	4	Pascagoula	1	1	5.5	2	1	10.5
WP 1 Skimmer (1)	3017	400	1 Utility	4	Pascagoula	1	1	5.5	2	1	10.5
WP 1 Skimmer (1)	3017	400	1 Utility	4	Tampa	1	1	21	2	1	26
WP 1 Skimmer (1)	3017	400	1 Utility	4	Miami	1	1	27	2	1	32

Shoreline Protection

Shoreline Protection Boom	VOO	Persons Req.	Storage/Warehouse Location	Hrs to Procure	Hrs to Loadout	Travel to Venice	Travel to Deployment Site	Hrs to Deploy	Total Hrs
MSRC									
50' 18" Boom	1 Crew	2	Port Arthur, TX	1	1	10	2	3	17
150' 18" Boom	1 Crew	2	Galveston, TX	1	1	13	2	3	20
50' 18" Boom	1 Crew	2	Ingleside, TX	1	1	18	2	3	25
9,700' 18" Boom	5 Crew	10	Lake Charles, LA	1	1	8	2	3	15
100' 18" Boom	1 Crew	2	Belle Chasse, LA	1	1	2	2	3	9
6,950' 18" Boom	4 Crew	8	Pascagoula, MS	1	1	5	2	3	12
50' 18" Boom	1 Crew	2	Tampa, FL	1	1	21	2	3	28
2,950' 18" Boom	3 Crew	6	Miami, FL	1	1	27	2	3	34

Shoreline Protection Boom	VOO	Persons Req.	Storage/Warehouse Location	Hrs to Procure	Hrs to Loadout	Travel to Venice	Travel to Deployment Site	Hrs to Deploy	Total Hrs
OMI Environmental (available through MSA)									
3,500' 18" Boom	2 Crew	4	Belle Chasse, LA	1	1	2	2	3	9
2,000' 18" Boom	1 Crew	2	Sulfur, LA	1	1	4	2	3	11
4,100' 18" Boom	1 Crew	2	Gonzalez, LA	1	1	4	2	3	11
10,000' 18" Boom	5 Crew	10	Harvey, LA	1	1	2	2	3	9
14,000' 18" Boom	6 Crew	12	Cut Off, LA	1	1	4	2	3	11
2,300' 18" Boom	2 Crew	4	Morgan City, LA	1	1	5	2	3	12
32,200' 18" Boom	10 Crew	20	New Iberia, LA	1	1	6	2	3	13
3,500' 18" Boom	1 Crew	2	Venice, LA	1	1	0	2	3	7
16,000' 18" Boom	6 Crew	12	Deer Park, TX	1	1	12	2	3	19
6,100' 18" Boom	3 Crew	6	La Marque, TX	1	1	13	2	3	20
20,000' 18" Boom	6 Crew	12	Port Arthur, TX	1	1	10	2	3	17

Wildlife Response	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Deployment	Hrs to Deploy	Total Hrs
CGA											
Wildlife Support Trailer	NA	NA	NA	2	Harvey	2	2	3	1	2	10
Bird Scare Guns (24)	NA	NA	NA	2	Harvey	2	2	3	1	2	10
Bird Scare Guns (12)	NA	NA	NA	2	Galveston	2	2	12	1	2	19
Bird Scare Guns (12)	NA	NA	NA	2	Aransas Pass	2	2	16.5	1	2	23.5
Bird Scare Guns (48)	NA	NA	NA	2	Lake Charles	2	2	7	1	2	14
Bird Scare Guns (24)	NA	NA	NA	2	Leeville	2	2	2	1	2	9

Response Asset	Total (bbls)
Offshore EDRC	502,535
Offshore Recovered Oil Storage	656,447+
Nearshore / Shallow Water EDRC	281,303
Nearshore / Shallow Water Recovered Oil Storage	381,937+

APPENDIX J
ENVIRONMENTAL MONITORING INFORMATION
(30 CFR PART 550.221 AND 550.252)

A. Monitoring Systems

LLOG subscribes to StormGeo Weather Service which provides access to real-time weather conditions, and provides periodic updates on impending inclement weather conditions such as tropical depressions, storms and/or hurricanes entering the Gulf of Mexico.

LLOG also relies on the National Weather Service to support the aforementioned subscribed service. During impending inclement weather conditions, LLOG closely coordinates the activity with our contractors and field personnel to ensure the safety of people for evacuation; measures to prepare the facility for evacuation to ensure protection of the environment and the facility/equipment.

Mississippi Canyon Block 546 is in water depths greater than 400 meters (1,312’); therefore LLOG will follow the guidelines of the applicable NTL 2009-G02 “Ocean Current Monitoring”, by monitoring and gathering ocean current data using Acoustic Doppler Current Profile (ADCP) while the MODU is on location.

B. Incidental Takes

LLOG is sensitive to the marine life and the environment we work in, especially regarding activities in or around the moon pool. LLOG will implement and adhere to, the BSEE NTL No. 2015-G03 “Marine Trash and Debris Awareness Training and Elimination” and BOEM NTL No. 2016-G01 “Vessel Strike Avoidance and Injured/Dead Protected Species Reporting”, and BOEM NTL No. 2016-G02 “Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program”. Moon pool daily observation log shall be maintained on the bridge. The deck supervisor on tour shall go to the bridge and log time, date, and results of each moon pool inspection. STOP WORK AUTHORITY shall be used and implemented, in a safe and timely manner, for any work that could affect marine life listed on the Endangered Species Act.

LLOG will operate in accordance with the regulations, agency guidance, and Appendix B of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion, and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste.

Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass. LLOG will collect and remove flotsam resulting from activities related to proposed operations. Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g. helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), “Think About It” (previously “All Washed Up: The Beach Litter Problem”). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from LLOG management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE.

Contract vessel operators can avoid marine mammals and reduce potential deaths by maintaining a vigilant watch for marine mammals and maintaining a safe distance of 91 meters or greater from whales and a distance of 45 meters or greater from small cetaceans. When assemblages of cetaceans are observed vessel speeds will be reduced to 10 knots or less. Vessel personnel should use a Gulf of Mexico reference guide to help identify the twenty-one species of whales and dolphins, and the single species of manatee that may be encountered in the Gulf of Mexico OCS. Contract vessel operators will comply with the measures included in Appendix C of the NMFS Biological Opinion, BOEM NTL 2016-G01 “Vessel Strike Avoidance and Injured/Dead Protected Species Reporting” and requirements of the Protected Species Lease Stipulation, except under extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

Vessel personnel must report sightings of any injured or dead protected marine mammal species immediately, regardless of whether the injury or death is caused by their vessel, to the NMFS Southeast Marine Mammal Stranding Hotline at (877) WHALE-HELP (877-942-5343). Additional information may be found at the following website: (<https://www.fisheries.noaa.gov/report>). Any injured or dead protected species should also be reported to takereport.nmfs@noaa.gov. In addition, if the injury or death was caused by a collision with the operator’s vessel, an entrapment within the operator’s equipment or vessel (e.g. moon pool), or an entanglement within the operator’s equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment/entanglement by email to protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed. These proposed operations may utilize a moon pool(s) to conduct various subsea activities. LLOG’s contractor or company representative will provide a dedicated crew member to monitor and continually survey the moon pool area during the operations for

sea turtles. If any sea turtle is detected in the moon pool, LLOG will cease operations and contact NMFS at nmfs.psoreview@noaa.gov and BSEE at protectedspecies@bsee.gov and 985-722-7902 for additional guidance and incidental report information. The procedures found in Appendix J of the NMFS Biological Opinion will be employed to free entrapped or entangled marine life safely.

C. Flower Garden Banks National Marine Sanctuary

The activities proposed in this plan are not within the Protective Zones of the Flower Garden Banks and Stetson Banks.

APPENDIX K
LEASE STIPULATION INFORMATION
(30 CFR PART 550.222 AND 550.253)

A. Lease Stipulations

BOEM invoked Stipulation No. 6 – Protected Species on Lease OCS-G-25098 Mississippi Canyon Block 546 & OCS-G-27277 MC 503 references measures to minimize or avoid potential adverse impacts to protected species (sea turtles, marine mammals, gulf sturgeon, and other federally protected species).

BOEM has issued Notice to Lessees BOEM NTL No. 2016-G02 “Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program”, BOEM NTL No. 2016-G01 “Vessel Strike Avoidance and Injured/Dead Protected Species Reporting” and BSEE NTL No. 2015-G03 “Marine Trash and Debris Awareness and Elimination”. There is no reason to believe that any sea turtles will be “taken” as a result of the operations proposed under this plan. LLOG will also comply with the Appendix B, C & J of the Biological Opinion as further stated in Appendix J of this plan.

APPENDIX L
ENVIRONMENTAL MITIGATION MEASURES INFORMATION
(30 CFR PART 550.223 AND 550.254)

A. Measures Taken to Avoid, Minimize, and Mitigate Impacts

This section does not apply to the operations as proposed herein.

B. Incidental Takes

LLOG is sensitive to the marine life and the environment we work in, especially regarding activities in or around the moon pool. LLOG will implement and adhere to, the BSEE NTL No. 2015-G03 “Marine Trash and Debris Awareness Training and Elimination”; BOEM NTL No. 2016-G01 “Vessel Strike Avoidance and Injured/Dead Protected Species Reporting”; and BOEM NTL No. 2016-G02 “Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program”. LLOG will also comply with the Appendix B, C & J of the Biological Opinion as further stated in Appendix J of this plan.

APPENDIX M
RELATED FACILITIES AND OPERATIONS INFORMATION
(30FR PART 550.256)

A. Related OCS Facilities and Operations –

LLOG intends to remove the existing Mississippi Canyon (MC) 546 Well SS005 jumper (SN 19148) from the existing MC 546 G1 Manifold. This clears the slot to allow the installation of a new well jumper for MC 546 Well SS007. Well SS007 will utilize the existing Location G Dual Lease Term pipelines and umbilical to flow back to the LLOG-operated MC 547 "A" (Who Dat) manned Platform for processing.

Remove MC 546 Well SS005 (SN 19148) a 68.17 long x 6.625" Jumper

Install an approximate 80' long x 6.625" Well Jumper at Mississippi Canyon Block 546 Well SS007.

LLOG intends to remove the existing Mississippi Canyon (MC) 503 Well SS001 jumper (SN 18212) from the existing MC 503 A Manifold and re-install a new well jumper in the same slot for MC 503 Well SS001. MC 503 Well SS001 will continue to utilize the existing Location A Dual Lease Term pipelines and umbilical to flow back to the LLOG-operated MC 547 "A" (Who Dat) manned Platform for processing.

Remove MC 503 Well SS005 (SN 18212) a 57.58 long x 6.625" Jumper

Re-Install an approximate 58' long x 6.625" Well Jumper at Mississippi Canyon Block 503 Well SS001.

APPENDIX N
SUPPORT VESSELS AND AIRCRAFT INFORMATION
(30 CFR PART 550.224 AND 550.257)

A. General

DURING DRILLING:

Drillship:

Type	Maximum Fuel Tank Storage Capacity	Maximum No. in Area at Any Time	Trip Frequency or Duration
Supply Boats	500 bbls	1	Six times weekly
Crew Boats	500 bbls	1	Three times weekly
Aircraft	279 gallons	1	As Needed

DURING INSTALLATION:

Type	Maximum Fuel Tank Storage Capacity	Maximum No. in Area at Any Time	Trip Frequency or Duration
LCV w/ROV Vessel (Jumpers)	8,805 bbls	1	30 days

Vessels/rigs **WILL NOT** transit the Rice's whale area.

B. Diesel Oil Supply Vessels

Size of Fuel Supply Vessel	Capacity of fuel Supply Vessel	Frequency of Fuel Transfers	Route Fuel Supply Vessel Will Take
180' OSV	1500 bbls	1/weekly	Fourchon, LA to Mississippi Canyon Block 546

C. Drilling Fluids Transportation

See Table 2 – Wastes you will Transport and/or Dispose of Onshore, located in Appendix G of this Plan.

D. Solid and Liquid Wastes Transportation

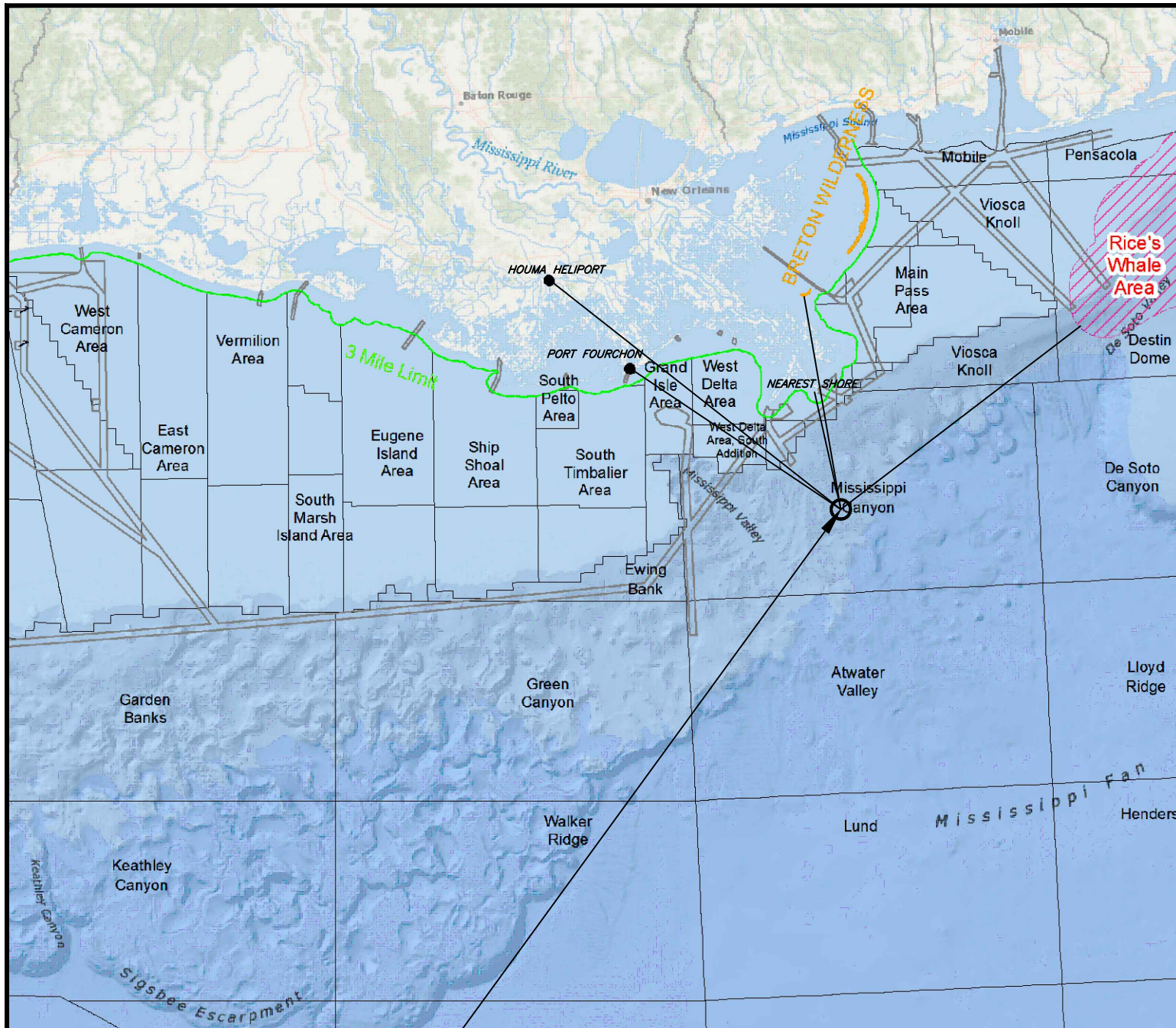
See Table 2 – Wastes you will Transport and/or Dispose of Onshore, located in Appendix G of this Plan.

E. Vicinity Map

Vicinity Plats showing the location of **Mississippi Canyon Block 546** relative to the nearest shoreline and onshore base and transit routes for vessels is included as *Attachment N-1*. Any rigs, vessels, supply boats, etc. utilized for these proposed activities will not transit the Rice's whale area.

Vicinity Map

Attachment N-1 (Public Information)



SITE OF PROPOSED WELLS

~38 STATUTE (33 NAUTICAL) MILES TO PLAQUEMINES PARISH (NEAREST SHORE)
 COORDINATE TO NEAREST POINT ON SHORELINE X = 952,619 Y = 10,519,414
 ~84 STATUTE (73 NAUTICAL) MILES TO PORT FOURCHON, LA
 ~124 STATUTE (108 NAUTICAL) MILES TO HOUMA HELIPORT, HOUMA, LA
 ~104 STATUTE (90 NAUTICAL) MILES TO RICE'S WHALE AREA
 ~115 KILOMETERS TO BRETON WILDERNESS

VICINITY MAP

THE DISTANCES SHOWN HEREON ARE FROM THE PROPOSED WELL TO THE NEAREST COASTLINE POINT AS OBTAINED FROM NOAA, ENTITLED NOAA MEDIUM RESOLUTION SHORELINE. <[HTTP://SHORELINE.NOAA.GOV/DATA/DATASHEETS/MEDRES.HTML](http://shoreline.noaa.gov/data/datasheets/MEDRES.HTML)>.

**LLOG EXPLORATION
OFFSHORE, L.L.C.**



Echo
OFFSHORE LLC

36499 Perkins Road
Prairieville, Louisiana 70769
Tel: 225-673-2163

NOT TO SCALE

DOCD PLAT

**PROPOSED WELLS #7 & ALT #7
OCS-G 25098 BLOCK 546
MISSISSIPPI CANYON AREA**

GULF OF AMERICA

DATUM: NAD 27 | SPHEROID: CLARKE 1866 | PROJECTION: U.T.M. | ZONE: 16

DRAWN BY: RJN | CHK. BY: MEK | REV. No.: 1 | JOB No.: 26-033 | DWG No.: 26-033-EXP_N07_REV1
 DATE: 07/02/2026 | REV. DATE: 7/7/26 | SCALE: N.T.S. | **SHEET 1 OF 1**

APPENDIX O
ONSHORE SUPPORT FACILITIES INFORMATION
(30 CFR PART 550.225 AND 550.258)

A. General

The proposed operations in Mississippi Canyon Block 546 will be located approximately 38 statute miles from the nearest Louisiana shoreline, approximately 84 statute miles from the onshore support base in Fourchon, LA and 124 miles to Bristow and PHI in Houma, LA heliports:

Name	Location	Existing/New/Modified
LLOG c/o GIS Yard	Fourchon, LA	Existing
PHI / Bristow- Heliports	Houma, LA	Existing

LLOG will use an existing onshore base to accomplish the following routine operations:

- Loading/Offloading point for equipment supporting the offshore operations.
- Dispatching personnel and equipment, and does not anticipate the need for any expansion of the selected facilities as a result of the activities proposed in this Supplemental Plan.
- Temporary storage for materials and equipment.
- 24 Hour Dispatcher

B. Support Base Construction or Expansion

The proposed operations are temporary in nature and do not require any immediate action to acquire additional land or expand existing base facilities.

C. Support Base Construction or Expansion Timetable

This section of the plan is not applicable to the proposed operations.

D. Waste Disposal

See Table 2 – Wastes you will Transport and/or Dispose of Onshore, located in Appendix G of this Plan.

APPENDIX P
COASTAL ZONE MANAGEMENT ACT (CZMA) INFORMATION
(30 CFR PART 550.226 AND 550.260)

Under direction of the Coastal Zone Management Act (CZMA), the States of Alabama, Florida, Louisiana, Mississippi, and Texas developed Coastal Zone Management Programs (CZMP) to allow for the supervision of significant land and water use activities that take place within or that could significantly impact their respective coastal zones.

A. Consistency Certification

A certificate of Coastal Zone Management Consistency for the State of Louisiana is not required for a Supplemental DOCD.

APPENDIX Q
ENVIRONMENTAL IMPACT ANALYSIS
(30 CFR PART 550.227 AND 550.261)

LLOG Offshore Exploration, L.L.C. (LLOG)

Supplemental DOCD
Mississippi Canyon Block
546 OCS-G 25098

(A) Impact Producing Factors

ENVIRONMENTAL IMPACT ANALYSIS WORKSHEET

Environment Resources	Impact Producing Factors (IPFs)					
	Categories and Examples					
	Refer to recent GOM OCS Lease Sale EIS for a more complete list of IPFs					
	Emissions (air, noise, light, etc.)	Effluents (muds, cutting, other discharges to the water column or seafloor)	Physical disturbances to the seafloor (rig or anchor emplacements, etc.)	Wastes sent to shore for treatment or disposal	Accidents (e.g., oil spills, chemical spills, H ₂ S releases)	Discarded Trash & Debris
Site-specific at Offshore Location						
Designated topographic features		(1)	(1)		(1)	
Pinnacle Trend area live bottoms		(2)	(2)		(2)	
Eastern Gulf live bottoms		(3)	(3)		(3)	
Benthic communities			(4)			
Water quality		X			X	
Fisheries		X			X	
Marine Mammals	X(8)	X			X(8)	X
Sea Turtles	X(8)	X			X(8)	X
Air quality	X(9)					
Shipwreck sites (known or potential)			(7)			
Prehistoric archaeological sites			(7)			
Vicinity of Offshore Location						
Essential fish habitat		X			X(6)	
Marine and pelagic birds					X	X
Public health and safety					(5)	
Coastal and Onshore						
Beaches					X(6)	X
Wetlands					X(6)	
Shore birds and coastal nesting birds					X(6)	
Coastal wildlife refuges						
Wilderness areas						

Footnotes for Environmental Impact Analysis Matrix

- 1) Activities that may affect a marine sanctuary or topographic feature. Specifically, if the well or platform site or any anchors will be on the seafloor within the:
 - 4-mile zone of the Flower Garden Banks, or the 3-mile zone of Stetson Bank;
 - 1000-meter, 1-mile or 3-mile zone of any topographic feature (submarine bank) protected by the Topographic Features Stipulation attached to an OCS lease;
 - Essential Fish Habitat (EFH) criteria of 500 feet from any no-activity zone; or
 - Proximity of any submarine bank (500-foot buffer zone) with relief greater than two meters that is not protected by the Topographic Features Stipulation attached to an OCS lease.
- 2) Activities with any bottom disturbance within an OCS lease block protected through the Live Bottom (Pinnacle Trend) Stipulation attached to an OCS lease.
- 3) Activities within any Eastern Gulf OCS block where seafloor habitats are protected by the Live Bottom (Low-Relief) Stipulation attached to an OCS lease.
- 4) Activities on blocks designated by the BOEM as being in water depths 300 meters or greater.
- 5) Exploration or production activities where H₂S concentrations greater than 500 ppm might be encountered.
- 6) All activities that could result in an accidental spill of produced liquid hydrocarbons or diesel fuel that you determine would impact these environmental resources. If the proposed action is located a sufficient distance from a resource that no impact would occur, the EIA can note that in a sentence or two.
- 7) All activities that involve seafloor disturbances, including anchor emplacements, in any OCS block designated by the BOEM as having high probability for the occurrence of shipwrecks or prehistoric sites, including such blocks that will be affected that are adjacent to the lease block in which your planned activity will occur. If the proposed activities are located a sufficient distance from a shipwreck or a prehistoric site that no impact would occur, the EIA can note that in a sentence or two.
- 8) All activities that you determine might have an adverse effect on endangered or threatened marine mammals or sea turtles or their critical habitats.
- 9) Production activities that involve transportation of produced fluids to shore using shuttle tankers or barges.

TABLE 1: THREATENED AND ENDANGERED SPECIES, CRITICAL HABITAT, AND MARINE MAMMAL INFORMATION

The federally listed endangered and threatened species potentially occurring in the lease area and along the Gulf Coast are provided in the table below.

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in the Gulf of Mexico	Gulf of Mexico Range
			Lease Area	Coastal		
Marine Mammals						
Manatee, West Indian	<i>Trichechus manatus latirostris</i>	T	--	X	Florida (peninsular)	Coastal Louisiana, Mississippi, Alabama, and Florida
Whale, Blue	<i>Balaenoptera masculus</i>	E	X ¹	--	None	GOM
Whale, Bryde’s ⁴	<i>Balaenoptera brydei/edeni</i>	E	X	--	None	Eastern GOM
Whale, Fin	<i>Balaenoptera physalus</i>	E	X ¹	--	None	GOM
Whale, Humpback	<i>Megaptera novaeangliae</i>	E	X ¹	--	None	GOM
Whale, North Atlantic Right	<i>Eubalaena glacialis</i>	E	X ¹	--	None	GOM
Whale, Rice’s ⁴	<i>Balaenoptera ricei</i>	E	X	--	None	GOM
Whale, Sei	<i>Balaenopiera borealis</i>	E	X ¹	--	None	GOM
Whale, Sperm	<i>Physeter catodon</i> (=macrocephalus)	E	X	--	None	GOM
Terrestrial Mammals						
Mouse, Beach (Alabama, Choctawatchee,	<i>Peromyscus polionotus</i>	E	-	X	Alabama, Florida (panhandle) beaches	Alabama, Florida (panhandle) beaches

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in the Gulf of Mexico	Gulf of Mexico Range
			Lease Area	Coastal		
Perdido Key, St. Andrew)						
Birds						
Plover, Piping	<i>Charadrius melodus</i>	T	-	X	Coastal Texas, Louisiana, Mississippi, Alabama, and Florida (panhandle)	Coastal GOM
Crane, Whooping	<i>Grus Americana</i>	E	-	X	Coastal Texas	Coastal Texas and Louisiana
Crane, Mississippi sandhill	<i>Grus canadensis pulla</i>	E	-	X	Coastal Mississippi	Coastal Mississippi
Curlew, Eskimo	<i>Numenius borealis</i>	E	-	X	none	Coastal Texas
Falcon, Northern Aplomado	<i>Falco femoralis septentrionalis</i>	E	-	X	none	Coastal Texas
Knot, Red	<i>Calidris canutus rufa</i>	T	-	X	None	Coastal GOM
Stork, Wood	<i>Mycteria americana</i>	T	-	X	None	Coastal Alabama and Florida
Reptiles						
Sea Turtle, Green	<i>Chelonia mydas</i>	T/E ³	X	X	None	GOM
Sea Turtle, Hawksbill	<i>Eretmochelys imbricata</i>	E	X	X	None	GOM
Sea Turtle, Kemp's Ridley	<i>Lepidochelys kempli</i>	E	X	X	None	GOM
Sea Turtle, Leatherback	<i>Dermochelys coriacea</i>	E	X	X	None	GOM
Sea Turtle, Loggerhead	<i>Caretta caretta</i>	T	X	X	Texas, Louisiana, Mississippi, Alabama, Florida	GOM
Fish						
Sturgeon, Gulf	<i>Acipenser oxyrinchus</i>	T	X	X	Coastal Louisiana, Mississippi,	Coastal Louisiana, Mississippi,

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in the Gulf of Mexico	Gulf of Mexico Range
			Lease Area	Coastal		
	(= <i>oxyrhynchus</i>) <i>desotoi</i>				Alabama, and Florida (panhandle)	Alabama and Florida (panhandle)
Shark, Oceanic Whitetip	<i>Carcharhinus longimanus</i>	E	X	—	None	GOM
Sawfish, Smalltooth	<i>Pristis pectinate</i>	E	-	X	None	Florida
Grouper, Nassau	<i>Epinephelus striatus</i>	T	-	X	None	Florida
Ray, Giant Manta	<i>Manta birostris</i>	E	X	--	None	GOM
Corals						
Coral, Elkhorn	<i>Acopora palmate</i>	T	X ²	X	Florida Keys and Dry Tortugas	Flower Garden Banks, Florida, and the Caribbean
Coral, Staghorn	<i>Acopora cervicornis</i>	T	X	X	Florida	Flower Garden Banks, Florida, and the Caribbean
Coral, Boulder Star	<i>Orbicella franksi</i>	T	X	X	none	Flower Garden Banks and Florida
Coral, Lobed Star	<i>Orbicella annularis</i>	T	X	X	None	Flower Garden Banks and Caribbean
Coral, Mountainous Star	<i>Orbicella faveolate</i>	T	X	X	None	Flower Garden Banks and Gulf of Mexico
Coral, Rough Cactus	<i>Mycetophyllia ferox</i>	T	-	X	None	Florida and Southern Gulf of Mexico

Abbreviations: E = Endangered; T = Threatened

1 The Blue, Fin, Humpback, North Atlantic Right, and Sei Whales are rare or extralimital in the Gulf of Mexico and are unlikely to be present in the lease area.

2 According to the 2017 EIS, Elkhorn Coral, while uncommon, has been found in the Flower Garden Banks. (BOEM 2017-009)

3 Green Sea Turtles are considered threatened throughout the Gulf of Mexico; however, the breeding population off the coast of Florida is considered endangered.

4 The Bryde's whale, also known as the Bryde's whale complex, is a collection of baleen whales that are still being researched to determine if they are the same species or if they are individual species of whales. In 2021, the Rice's whale, formerly known as the Gulf of Mexico Bryde's whale, was determined to be a

separate species. There are less than 100 Rice's whales living in the Gulf of Mexico year-round. These whales retain all the protections of the Gulf of Mexico Bryde's whale under the Endangered Species Act while the regulations are being updated to reflect the name change. Other Bryde's whales are migratory and may enter the Gulf of Mexico; however, the migratory Bryde's whales are rare or extralimital in the Gulf of Mexico and are unlikely to be present in the lease area.

(B) Analysis

Site-Specific at Mississippi Canyon Block 546

Proposed operations consist of the drilling of one location with a SHL of Mississippi Canyon Block 546 and a BHL of Mississippi Canyon Block 502. The operations will be conducted with a Drillship or DP semi-submersible with a moonpool as described in **Appendix I** of this plan. There are no seismic surveys, pile driving, or pipelines making landfall associated with the operations covered by this plan.

1. Designated Topographic Features

Potential IPFs to topographic features as a result of the proposed operations include physical disturbances to the seafloor, effluents, and accidents.

Physical disturbances to the seafloor: Mississippi Canyon Block 546 is 32.3 miles from the closest designated Topographic Features Stipulation Block (Sackett Bank); therefore, no adverse impacts are expected. Additionally, a Drillship or DP semi-submersible is being used for the proposed activities; therefore, only an insignificant amount of seafloor will be disturbed.

Effluents: Mississippi Canyon Block 546 is 32.3 miles from the closest designated Topographic Features Stipulation Block (Sackett Bank); therefore, no adverse impacts are expected.

Accidents: It is unlikely that an accidental surface or subsurface spill would occur from the proposed activities (refer to statistics in **Item 5**, Water Quality). Oil spills cause damage to benthic organisms only if the oil contacts the organisms. Oil from a surface spill can be driven into the water column; measurable amounts have been documented down to a 10-meter depth. At this depth, the oil is found only at concentrations several orders of magnitude lower than the amount shown to have an effect on corals. Because the crests of topographic features in the Northern Gulf of Mexico are found below 10 meters, oil from a surface spill is not expected to reach their sessile biota. Oil from a subsurface spill is not applicable due to the distance of these blocks from a topographic area. The activities proposed in this plan will be covered by LLOG's Regional OSRP (refer to information submitted in **Appendix H**).

If dispersants were utilized as a response method, the fate and effects of spilled oil would be impacted. Dispersants have been utilized in previous spill response efforts and were used extensively in the response to the Deepwater Horizon oil spill, with both surface and sub-surface applications. Reports on dispersant usage on surface oil indicate that a majority of the dispersed oil remains in the top 10 meters of the water column, with 60 percent of the oil in the top two meters of water (McAuliffe et al, 1981; Lewis and Aurand, 1997; OCS Report BOEM 2017-007). Lubchenko et al. (2010) report that most chemically dispersed surface oil from the Deepwater Horizon explosion and oil spill remained in the top six meters of the water column

where it mixed with surrounding waters and biodegraded (BOEM 2017-007). None of the topographic features or potentially sensitive biological features in the GOM are shallower than 10 meters (33 feet), and only the Flower Garden Banks are shallower than 20 meters (66 feet).

In one extraordinary circumstance with an unusual combination of meteorological and oceanographic conditions, a tropical storm forced a large volume of Deepwater Horizon oil spill-linked surface oil/dispersant mixture to as deep as 75 meters (246 feet), causing temporary exposure to mesophotic corals in the Pinnacle Trend area and leading to some coral mortality and sublethal impacts (Silva et al., 2015; BOEM 2017-007).

Additionally, concentrations of dispersed and dissolved oil in the Deepwater Horizon oil-spill subsea plume were reported to be in the parts per million range or less and were generally lower away from the water's surface and away from the well head (Adcroft et al., 2010; Haddad and Murawski, 2010; Joint Analysis Group, 2010; Lubchenco et al, 2010; BOEM 2017-007).

In the case of subsurface spills like a blowout or pipeline leak, dispersants may be injected at the seafloor. This will increase oil concentrations near the source but tend to decrease them further afield, especially at the surface. Marine organisms in the lower water column will be exposed to an initial increase of water-soluble oil compounds that will dilute in the water column over time (Lee et al., 2013a; NAS 2020).

Dispersant application involves a trade-off between decreasing the risk to the surface and shoreline habitat and increasing the risk beneath the surface. The optimal trade-off must account for various factors, including the type of oil spilled, the spill volume, the weather and sea state, the water depth, the degree of turbulence, and the relative abundance and life stages of organisms (NRC, 2005; NAS 2020).

Chemical dispersants may increase the risk of toxicity to subsurface organisms by increasing bioavailability of the oil. However, it is important to note that at the 1:20 dispersant-to-oil ratio recommended for use during response operations, the dispersants currently approved for use are far less acutely toxic than oil is. Toxicity of chemically dispersed oil is primarily due to the oil itself and its enhanced bioavailability (Lee et al., 2015; NAS 2020).

With the exception of special Federal management areas or designated exclusion areas, dispersants have been preapproved for surface use, which provides the USCG On-Scene Coordinator with the authority to approve the use of dispersants. However, that approval would only be granted upon completion of the protocols defined in the appropriate Area Contingency Plan (ACP) and the Regional Response Team (RRT) Dispersant Plan. The protocols include conducting an environmental benefit analysis to determine if the dispersant use will prevent a substantial threat to the public health or welfare or minimize serious environmental

damage. The Regional Response Team would be notified immediately to provide technical support and guidance in determining if the dispersant use meets the established criteria and provide an environmental benefit. Additionally, there is currently no preapproval for subsea dispersant injection and the USCG On-Scene Coordinator must approve use of this technology before any subsea application. Due to the unprecedented volume of dispersants applied for an extended period of time, the U.S. National Response Team has developed guidance for atypical dispersant operations to ensure that planning and response activities will be consistent with national policy (BOEM 2017-007).

Dispersants were used extensively in the response to the Deepwater Horizon oil spill, both surface and sub-surface applications. However, during a May 2016 significant oil spill (approximately 1,926 barrels) in the Gulf of Mexico dispersants were not utilized as part of the response. The Regional Response Team was consulted and recommended that dispersants not be used, despite acknowledging the appropriate protocols were correctly followed and that there was a net environmental benefit in utilizing dispersants. This demonstrates that the federal authorities (USCG and RRT) will be extremely prudent in their decision-making regarding dispersant use authorizations.

Due to the distance of this block from a topographic area and the coverage of the activities proposed in this plan by LLOG's Regional OSRP (refer to information submitted in **Appendix H**), impacts to topographic features from surface or sub-surface oil spills are not expected.

There are no other IPFs (including emissions and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact topographic features.

2. Pinnacle Trend Area Live Bottoms

Potential IPFs to pinnacle trend area live bottoms from the proposed operations include physical disturbances to the seafloor, emissions (noise / sound), effluents, and accidents.

Physical disturbances to the seafloor: Mississippi Canyon Block 546 is 66 miles from the closest live bottom (pinnacle trend) area; therefore, no adverse impacts are expected. Additionally, a Drillship or DP semi-submersible is being used for the proposed activities; therefore, only an insignificant amount of seafloor will be disturbed.

Emissions (noise / sound): All routine OCS oil-and gas-related activities have some element of sound generation. Common sound sources include propeller cavitation, rotating machinery, and reciprocating machinery, which are associated with routine OCS oil-and gas-related activities such as vessel traffic, drilling, construction, and oil and gas production, processing, and transport. Sound introduced into the marine environment as a result of human activities has the potential to affect marine organisms. Although there is little information available on

sound detection and sound-mediated behaviors for marine invertebrates, the overall impacts on pinnacle and low-relief feature communities from anthropogenic noise are expected to be negligible (BOEM 2017-009). Additionally, Mississippi Canyon Block 546 is 66 miles from the closest live bottom (pinnacle trend) area; therefore, no adverse impacts are expected.

Effluents: Mississippi Canyon Block 546 is 66 miles from the closest live bottom (pinnacle trend) area; therefore, no adverse impacts are expected.

Accidents: It is unlikely that an accidental surface or subsurface spill would occur from the proposed activities (refer to statistics in **Item 5**, Water Quality). Oil spills have the potential to foul benthic communities and cause lethal and sublethal effects on live bottom organisms. Oil from a surface spill can be driven into the water column; measurable amounts have been documented down to a 10-meter depth. At this depth, the oil is found only at concentrations several orders of magnitude lower than the amount shown to have an effect on marine organisms. Oil from a subsurface spill is not expected to impact pinnacle trend area live bottoms due to the distance of this block from a live bottom (pinnacle trend) area and the coverage of the activities proposed in this plan by LLOG's Regional OSRP (refer to information submitted in **Appendix H**).

If dispersants were utilized as a response method, the fate and effects of spilled oil would be impacted. A detailed discussion on dispersants, their usage during the Deepwater Horizon oil spill, and their impacts on different levels of benthic communities can be found in **Item 1**.

There are no other IPFs (including wastes sent to shore for treatment or disposal) from the proposed activities that are likely to impact a live bottom (pinnacle trend) area.

3. Eastern Gulf Live Bottoms

Potential IPFs on Eastern Gulf live bottoms from the proposed operations include physical disturbances to the seafloor, emissions (noise / sound), effluents, and accidents.

Physical disturbances to the seafloor: Mississippi Canyon Block 546 is not located in an area characterized by the existence of live bottoms, and this lease does not contain a Live-Bottom Stipulation requiring a photo documentation survey and survey report. Additionally, a Drillship or DP semi-submersible is being used for the proposed activities; therefore, only an insignificant amount of seafloor will be disturbed.

Emissions (noise / sound): All routine OCS oil-and gas-related activities have some element of sound generation. Common sound sources include propeller cavitation, rotating machinery, and reciprocating machinery, which are associated with routine OCS oil-and gas-related activities such as vessel traffic, drilling, construction, and oil and gas production, processing,

and transport. Sound introduced into the marine environment as a result of human activities has the potential to affect marine organisms. Although there is little information available on sound detection and sound-mediated behaviors for marine invertebrates, the overall impacts on pinnacle and low-relief feature communities from anthropogenic noise are expected to be negligible (BOEM 2017-009). Additionally, Mississippi Canyon Block 546 is not located in an area characterized by the existence of live bottoms; therefore, no adverse impacts are expected.

Effluents: Mississippi Canyon Block 546 is not located in an area characterized by the existence of live bottoms; therefore, no adverse impacts are expected.

Accidents: It is unlikely that an accidental surface or subsurface spill would occur from the proposed activities (refer to statistics in **Item 5**, Water Quality). Oil spills cause damage to live bottom organisms only if the oil contacts the organisms. Oil from a surface spill can be driven into the water column; measurable amounts have been documented down to a 10-meter depth. At this depth, the oil is found only at concentrations several orders of magnitude lower than the amount shown to have an effect on marine invertebrates. Oil from a subsurface spill is not expected to impact Eastern Gulf live bottoms due to the distance of this block from a live bottom area and coverage of the activities proposed in this plan by LLOG's Regional OSRP (refer to information submitted in **Appendix H**).

If dispersants were utilized as a response method, the fate and effects of spilled oil would be impacted. A detailed discussion on dispersants, their usage during the Deepwater Horizon oil spill, and their impacts on different levels of benthic communities can be found in **Item 1**.

There are no other IPFs (including wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact an Eastern Gulf live bottom area.

4. Deepwater Benthic Communities

There are no IPFs (including emissions (noise / sound), physical disturbances to the seafloor, wastes sent to shore for treatment or disposal, and accidents) from the proposed operations that are likely to cause impacts to deepwater benthic communities.

Mississippi Canyon Block 546 is located in water depths of 984 feet (300 meters) or greater. At such depth high-density, deepwater benthic communities may sometimes be found. However, Mississippi Canyon Block 546 is approximately 17.1 miles from a known deepwater benthic community site (Mississippi Canyon Block 640), listed in NTL 2009-G40. Additionally, a Drillship or DP semi-submersible is being used for the proposed activities; therefore, only an insignificant amount of seafloor will be disturbed. Due to the distance from the closest known deepwater benthic community and because physical disturbances to the seafloor will be minimized by the

use of a Drillship or DP semi-submersible, LLOG's proposed operations in Mississippi Canyon Block 546 are not likely to impact deepwater benthic communities.

Deepwater benthic communities would potentially be subject to detrimental effects from a catastrophic seafloor blowout due to sediment and oiled sediment from the initial event (BOEM 2017-007). However, this is unlikely due to the distancing requirements described in NTL 2009-G40. Additionally, the potential impacts would be localized due to the directional movement of oil plumes by water currents and the scattered, patchy distribution of sensitive habitats. Although widely dispersed, biodegraded particles of a passing oil plume might impact patchy habitats, no significant impacts would be expected to the Gulfwide population. Most deepwater benthic communities are expected to experience no impacts from a catastrophic seafloor blowout due to the directional movement of oil plumes by the water currents and their scattered, patchy distribution. Impacts may be expected if a spill were to occur close to a deepwater benthic habitat, however, beyond the localized area of impact particles would become increasingly biodegraded and dispersed. Localized impacts to deepwater benthic organisms would be expected to be mostly sublethal (BOEM 2017-007).

If dispersants were utilized as a response method, the fate and effects of spilled oil would be impacted. A detailed discussion on dispersants, their usage during the Deepwater Horizon oil spill, and their impacts on different levels of benthic communities can be found in **Item 1**.

5. Water Quality

Potential IPFs that could result in water quality degradation from the proposed operations in Mississippi Canyon Block 546 include disturbances to the seafloor, effluents, and accidents.

Physical disturbances to the seafloor: Bottom area disturbances resulting from the emplacement of drill rigs, the drilling of wells and the installation of platforms and pipelines would increase water-column turbidity and re-suspension of any accumulated pollutants, such as trace metals and excess nutrients. This would cause short-lived impacts on water quality conditions in the immediate vicinity of the emplacement operations. Additionally, a Drillship or DP semi-submersible is being used for the proposed activities; therefore, only an insignificant amount of seafloor will be disturbed.

Effluents: Levels of contaminants in drilling muds and cuttings and produced water discharges, discharge-rate restrictions and monitoring and toxicity testing are regulated by the EPA NPDES permit, thereby eliminating many significant biological or ecological effects. Operational discharges are not expected to cause significant adverse impacts to water quality. Additionally, an analysis of the best available information from the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion on the Federally Regulated Oil and Gas Program Activities in the Gulf of Mexico (NMFS, 2020) concludes that exposures to

toxicants in discharges from oil and gas activities are not likely to adversely affect ESA-listed species.

Accidents: IPFs related to OCS oil- and gas-related accidental events primarily involve drilling fluid spills, chemical spills, and oil spills.

Drilling Fluid Spills

Water-based fluid (WBF) and Synthetic-based fluid (SBF) spills may result in elevated turbidity, which would be short term, localized, and reversible. The WBF is normally discharged to the seafloor during riserless drilling, which is allowable due to its low toxicity. For the same reasons, a spill of WBF would have negligible impacts. The SBF has low toxicity, and the discharge of SBF is allowed to the extent that it adheres onto drill cuttings. Both USEPA Regions 4 and 6 permit the discharge of cuttings wetted with SBF as long as the retained SBF amount is below a prescribed percent, meets biodegradation and toxicity requirements, and is not contaminated with the formation oil or PAH. A spill of SBF may cause a temporary increase in biological oxygen demand and locally result in lowered dissolved oxygen in the water column. Also, a spill of SBF may release an oil sheen if formation oil is present in the fluid. Therefore, impacts from a release of SBF are considered to be minor. Spills of SBF typically do not require mitigation because SBF sinks in water and naturally biodegrades, seafloor cleanup is technically difficult, and SBF has low toxicity. (BOEM 2017-009)

Chemical Spills

Accidental chemical spills could result in temporary localized impacts on water quality, primarily due to changing pH. Chemical spills are generally small volume compared with spills of oil and drilling fluids. During the period of 2007 to 2014, small chemical spills occurred at an average annual volume of 28 barrels, while large chemical spills occurred at an average annual volume of 758 barrels. These chemical spills normally dissolve in water and dissipate quickly through dilution with no observable effects. Also, many of these chemicals are approved to be commingled in produced water for discharge to the ocean, which is a permitted activity. Therefore, impacts from chemical spills are considered to be minor and do not typically require mitigation because of technical feasibility and low toxicity after dilution (BOEM 2017-009).

Oil Spills

Oil spills have the greatest potential of all OCS oil-and gas-related activities to affect water quality. Small spills (<1,000 barrels) are not expected to substantially impact water quality in coastal or offshore waters because the oil dissipates quickly through dispersion and weathering while still at sea. Reasonably foreseeable larger spills ($\geq 1,000$ barrels), however, could impact water quality in coastal and offshore waters (BOEM 2017-007). However, based on data provided in the BOEM 2016 Update of Occurrence Rates for Offshore Oil Spills, it is unlikely that an accidental surface or subsurface spill of a significant volume would occur from the proposed

activities. Between 2001 and 2015 OCS operations produced eight billion barrels of oil and spilled 0.062 percent of this oil, or one barrel for every 1,624 barrels produced. (The overall spill volume was almost entirely accounted for by the 2010 Deepwater Horizon blowout and subsequent discharge of 4.9 million barrels of oil. Additional information on unlikely scenarios and impacts from very large oil spills are discussed in the Catastrophic Spill Event Analysis white paper (BOEM 2017-007).

If a spill were to occur, the water quality of marine waters would be temporarily affected by the dissolved components and small oil droplets. Dispersion by currents and microbial degradation would remove the oil from the water column and dilute the constituents to background levels. Historically, changes in offshore water quality from oil spills have only been detected during the life of the spill and up to several months afterwards. Most of the components of oil are insoluble in water and therefore float. Dispersants will only be used if approved by the Regional Response Team in coordination with the RRT Dispersant Plan and RRT Biological Assessment for Dispersants.

Oil spills, regardless of size, may allow hydrocarbons to partition into the water column in a dissolved, emulsion, and/or particulate phase. Therefore, impacts from reasonably foreseeable oil spills are considered moderate. Mitigation efforts for oil spills may include booming, burning, and the use of dispersants (BOEM 2017-009).

These methods may cause short-term secondary impacts to water quality, such as the introduction of additional hydrocarbon into the dissolved phase through the use of dispersants and the sinking of hydrocarbon residuals from burning. Since burning and the use of dispersants put additional hydrocarbons into the dissolved phase, impacts to water quality after mitigation efforts are still considered to be moderate, because dissolved hydrocarbons extend down into the water column. This results in additional exposure pathways via ingestion and gill respiration and may result in acute or chronic effects to marine life (BOEM 2017-009).

Most oil-spill response strategies and equipment are based upon the simple principle that oil floats. However, as evident during the Deepwater Horizon explosion, oil spill, and response, this is not always true. Sometimes it floats and sometimes it suspends within the water column or sinks to the seafloor (BOEM 2017-009).

Oil that is chemically dispersed at the surface moves into the top six meters of the water column where it mixes with surrounding waters and begins to biodegrade (U.S. Congress, Office of Technology Assessment, 1990). Dispersant use, in combination with natural processes, breaks up oil into smaller components that allows them to dissipate into the water and degrade more rapidly (Nalco, 2010). Dispersant use must be in accordance with an RRT Preapproved Dispersant Use Manual and with any conditions outlined within an RRT's site-specific,

dispersant approval given after a spill event. Consequently, dispersant use must be in accordance with the restrictions for specific water depths, distances from shore, and monitoring requirements. At this time, neither the Region IV nor the Region VI RRT dispersant use manuals, which cover the GOM region, give preapproval for the application of dispersant use subsea (BOEM 2017-009).

The operations proposed in this plan will be covered by LLOG's Regional Oil Spill Response Plan, which discusses potential response actions in more detail (refer to information submitted in **Appendix H**).

There are no other IPFs (including emissions, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact water quality.

6. Fisheries

There are multiple species of fish in the Gulf of Mexico, including the endangered and threatened species listed in **Table 1** at the beginning of this Environmental Impact Assessment. More information regarding the endangered gulf sturgeon (**Item 20.2**), oceanic whitetip shark (**Item 20.3**), and giant manta ray (**Item 20.4**) can be found below. Potential IPFs to fisheries as a result of the proposed operations in Mississippi Canyon Block 546 include physical disturbances to the seafloor, emissions (noise / sound), effluents, and accidents.

Physical disturbances to the seafloor: The emplacement of a structure or drilling rig results in minimal loss of bottom trawling area to commercial fishermen. Pipelines cause gear conflicts which result in losses of trawls and shrimp catch, business downtime and vessel damage. Most financial losses from gear conflicts are covered by the Fishermen's Contingency Fund (FCF). The emplacement and removal of facilities are not expected to cause significant adverse impacts to fisheries. Additionally, a Drillship or DP semi-submersible is being used for the proposed activities; therefore, only an insignificant amount of seafloor will be disturbed.

Emissions (noise / sound): All routine OCS oil-and gas-related activities have some element of sound generation. Common sound sources include propeller cavitation, rotating machinery, and reciprocating machinery, which are associated with routine OCS oil-and gas-related activities such as vessel traffic, drilling, construction, and oil and gas production, processing, and transport. Sound introduced into the marine environment as a result of human activities has the potential to affect marine organisms by stimulating behavioral response, masking biologically important signals, causing temporary or permanent hearing loss (Popper et al., 2005; Popper et al., 2014), or causing physiological injury (e.g., barotrauma) resulting in mortality (Popper and Hastings, 2009). The potential for anthropogenic sound to affect any individual organism is dependent on the proximity to the source, signal characteristics, received

peak pressures relative to the static pressure, cumulative sound exposure, species, motivation, and the receiver's prior experience. In addition, environmental conditions (e.g., temperature, water depth, and substrate) affect sound speed, propagation paths, and attenuation, resulting in temporal and spatial variations in the received signal for organisms throughout the ensonified area (Hildebrand, 2009).

Sound detection capabilities among fishes vary. For most fish species, it is reasonable to assume hearing sensitivity to frequencies below 500 Hertz (Hz) (Popper et al., 2003 and 2014; Popper and Hastings, 2009; Slabbekoorn et al., 2010; Radford et al., 2014). The band of greatest interest to this analysis, low-frequency sound (30-500 Hz), has come to be dominated by anthropogenic sources and includes the frequencies most likely to be detected by most fish species. For example, the noise generated by large vessel traffic typically results from propeller cavitation and falls within 40-150 Hz (Hildebrand, 2009; McKenna et al., 2012). This range is similar to that of fish vocalizations and hearing and could result in a masking effect.

Masking occurs when background noise increases the threshold for a sound to be detected; masking can be partial or complete. If detection thresholds are raised for biologically relevant signals, there is a potential for increased predation, reduced foraging success, reduced reproductive success, or other effects. However, fish hearing and sound production may be adapted to a noisy environment (Wysocki and Ladich, 2005). There is evidence that fishes are able to efficiently discriminate between signals, extracting important sounds from background noise (Popper et al., 2003; Wysocki and Ladich, 2005). Sophisticated sound processing capabilities and filtering by the sound sensing organs essentially narrows the band of masking frequencies, potentially decreasing masking effects. In addition, the low-frequency sounds of interest propagate over very long distances in deep water, but these frequencies are quickly lost in water depths between $\frac{1}{2}$ and $\frac{1}{4}$ the wavelength (Ladich, 2013). This would suggest that the potential for a masking effect from low-frequency noise on behaviors occurring in shallow coastal waters may be reduced by the receiver's distance from sound sources, such as busy ports or construction activities.

Pulsed sounds generated by OCS oil-and gas-related activities (e.g., impact-driven piles and airguns) can potentially cause behavioral response, reduce hearing sensitivity, or result in physiological injury to fishes and invertebrate resources. However, there are no pulsed sound generation activities proposed for these operations.

Support vessel traffic, drilling, production facilities, and other sources of continuous sounds contribute to a chronic increase in background noise, with varying areas of effect that may be influenced by the sound level, frequencies, and environmental factors (Hildebrand, 2009; Slabbekoorn et al., 2010; McKenna et al., 2012). These sources have a low potential for causing physiological injury or injuring hearing in fishes and invertebrates (Popper et al., 2014).

However, continuous sounds have an increased potential for masking biologically relevant sounds than do pulsed signals. The potential effects of masking on fishes and invertebrates are difficult to assess in the natural setting for communities and populations of species, but evidence indicates that the increase to background noise as a result of OCS oil and gas operations would be relatively minor. Therefore, it is expected that the cumulative impact to fishes and invertebrate resources would be minor and would not extend beyond localized disturbances or behavioral modification.

Despite the importance of many sound-mediated behaviors and the potential biological costs associated with behavioral response to anthropogenic sounds, many environmental and biological factors limit potential exposure and the effects that OCS oil-and gas-related sounds have on fishes and invertebrate resources. The overall impact to fishes and invertebrate resources due to anthropogenic sound introduced into the marine environment by OCS oil-and gas-related routine activities is expected to be minor.

Effluents: Effluents such as drilling fluids and cuttings discharges contain components and properties which are detrimental to fishery resources. Moderate petroleum and metal contamination of sediments and the water column can occur out to several hundred meters down current from the discharge point. Offshore discharges are expected to disperse and dilute to very near background levels in the water column or on the seafloor within 3,000 meters of the discharge point and are expected to have negligible effect on fisheries. Additionally, an analysis of the best available information from the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion on the Federally Regulated Oil and Gas Program Activities in the Gulf of Mexico (NMFS, 2020) concludes that exposures to toxicants in discharges from oil and gas activities are not likely to adversely affect ESA-listed species.

Accidents: Collisions between support vessels and ESA-listed fish, would be unusual events, however, should one occur, death or injury to ESA-listed fish is possible. Contract vessel operators can avoid protected aquatic species and reduce potential deaths by maintaining a vigilant watch and a distance of 50 meters or greater, with the exception of animals that approach the vessel. Vessel personnel should use a Gulf of Mexico reference guide that includes identifying information on marine mammals, sea turtles, and other marine protected species (i.e., Endangered Species Act listed species such as Gulf sturgeon, giant manta ray, or oceanic whitetip shark) that may be encountered in the Gulf of Mexico Outer Continental Shelf (OCS).

Contract vessel operators will comply with the measures included in Appendix C of the NMFS Biological Opinion and requirements of the Protected Species Lease Stipulation, except under

extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

Should an ESA-listed fish (e.g., giant manta ray, oceanic whitetip shark, or Gulf sturgeon) be entrapped, entangled, or injured, personnel should contact the ESA Section 7 biologist at (301) 427-8413 (nmfs.psoreview@noaa.gov) and report all incidents to takereport.nmfs@noaa.gov. After making the appropriate notifications, LLOG may call BSEE at (985) 722-7902 for questions or additional guidance on recovery assistance needs, continued monitoring requirements, and incidental report information which at minimum is detailed below. Additional information may be found at the following website: <https://www.fisheries.noaa.gov/report>. Any injured or dead protected species should also be reported to takereport.nmfs@noaa.gov. In addition, if the injury or death was caused by a collision with the operator's vessel, an entrapment within the operator's equipment or vessel (e.g. moon pool), or an entanglement within the operator's equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment/entanglement by email to protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

An accidental oil spill has the potential to cause some detrimental effects on fisheries; however, it is unlikely that such an event would occur from the proposed activities (refer to **Item 5**, Water Quality). The effects of oil on mobile adult finfish or shellfish would likely be sublethal and the extent of damage would be reduced to the capacity of adult fish and shellfish to avoid the spill, to metabolize hydrocarbons, and to excrete both metabolites and parent compounds. The activities proposed in this plan will be covered by LLOG's Regional OSRP (refer to information submitted in **Appendix H**).

There are no other IPFs (including wastes sent to shore for treatment or disposal) from the proposed operations that are likely to cause impacts to fisheries.

7. Marine Mammals

The latest population estimates for the Gulf of Mexico revealed that cetaceans of the continental shelf and shelf-edge were almost exclusively bottlenose dolphin and Atlantic spotted dolphin. Squid eaters, including dwarf and pygmy killer whale, Risso's dolphin, rough-toothed dolphin, and Cuvier's beaked whale, occurred most frequently along the upper slope in areas outside of anticyclones. The Rice's whale (née Gulf of Mexico Bryde's whale) is the only commonly occurring baleen whale in the northern Gulf of Mexico and has been sighted off western Florida and in the De Soto Canyon region. Florida manatees have been sighted along the entire northern GOM but are mainly found in the shallow coastal waters of Florida, which are unassociated with the proposed actions. A complete list of all endangered and threatened

marine mammals in the GOM may be found in **Table 1** at the beginning of this Environmental Impact Assessment. More information regarding the endangered Rice's whale can be found in **Item 20.1** below. Potential IPFs to marine mammals as a result of the proposed operations in Mississippi Canyon Block 546 include emissions (noise / sound), effluents, discarded trash and debris, and accidents.

Emissions (noise / sound): Noises from drilling activities, support vessels and helicopters (i.e., non-impulsive anthropogenic sound) may elicit a startle reaction from marine mammals. This reaction may lead to disruption of marine mammals' normal activities. Stress may make them more vulnerable to parasites, disease, environmental contaminants, and/or predation (Majors and Myrick, 1990). Responses to sound exposure may include lethal or nonlethal injury, temporary hearing impairment, behavioral harassment and stress, or no apparent response. Noise-induced stress is possible, but it is little studied in marine mammals. Tyack (2008) suggests that a more significant risk to marine mammals from sound are these less visible impacts of chronic exposure. There is little conclusive evidence for long-term displacements and population trends for marine mammals relative to noise.

Vessels are the greatest contributors to increases in low-frequency ambient sound in the sea (Andrew et al. 2011). Sound levels and tones produced are generally related to vessel size and speed. Larger vessels generally emit more sound than smaller vessels, and vessels underway with a full load, or those pushing or towing a load, are noisier than unladen vessels. Cetacean responses to aircraft depend on the animals' behavioral state at the time of exposure (e.g., resting, socializing, foraging, or traveling) as well as the altitude and lateral distance of the aircraft to the animals (Luksenburg and Parsons 2009). The underwater sound intensity from aircraft is less than produced by vessels, and visually, aircraft are more difficult for whales to locate since they are not in the water and move rapidly (Richter et al. 2006). Perhaps not surprisingly then, when aircraft are at higher altitudes, whales often exhibit no response, but lower flying aircraft (e.g., approximately 500 meters or less) have been observed to elicit short-term behavioral responses (Luksenburg and Parsons 2009; NMFS 2017b; NMFS 2017f; Patenaude et al. 2002; Smultea et al. 2008a; Wursig et al. 1998). Thus, aircraft flying at low altitude, at close lateral distances and above shallow water elicit stronger responses than aircraft flying higher, at greater lateral distances and over deep water (Patenaude et al. 2002; Smultea et al. 2008a). Routine OCS helicopter traffic would not be expected to disturb animals for extended periods, provided pilots do not alter their flight patterns to more closely observe or photograph marine mammals. Helicopters, while flying offshore, generally maintain altitudes above 700 feet during transit to and from a working area, and at an altitude of about 500 feet between platforms. The duration of the effects resulting from a startle response is expected to be short-term during routine flights, and the potential effects will be insignificant to sperm whales and Rice's whales. Therefore, we find that any disturbance that may result from aircraft associated with the proposed action is not likely to adversely affect ESA-listed whales.

Drilling and production noise would contribute to increases in the ambient noise environment of the GOM, but they are not expected in amplitudes sufficient to cause either hearing or behavioral impacts (BOEM 2017-009). There is the possibility of short-term disruption of movement patterns and/or behavior caused by vessel noise and disturbance; however, these are not expected to impact survival and growth of any marine mammal populations in the GOM. Additionally, the National Marine Fisheries Service published a final recovery plan for the sperm whale, which identified anthropogenic noise as either a low or unknown threat to sperm whales in the GOM (USDOC, NMFS, 2010b). Sirenians (i.e., manatees) are not located within the area of operations. Additionally, there were no specific noise impact factors identified in the latest BOEM environmental impact statement for sirenians related to GOM OCS operations (BOEM 2017-009). See **Item 20.1** for details on the Rice's whale.

Impulsive sound impacts (i.e., pile driving, seismic surveys) are not included among the activities proposed under this plan.

Effluents: Drilling fluids and cuttings discharges contain components which may be detrimental to marine mammals. Most operational discharges are diluted and dispersed upon release. Any potential impact from drilling fluids would be indirect, either as a result of impacts on prey items or possibly through ingestion in the food chain (API, 1989).

Discarded trash and debris: Both entanglement in and ingestion of debris have caused the death or serious injury of marine mammals (Laist, 1997; MMC, 1999). The limited amount of marine debris, if any, resulting from the proposed activities is not expected to substantially harm marine mammals. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V, the Marine Plastic Pollution Research and Control Act, and regulations imposed by various agencies, including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA).

LLOG will operate in accordance with the regulations, agency guidance, and Appendix B of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass. LLOG will also collect and remove flotsam resulting from activities related to proposed operations.

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support

services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), “Think About It” (previously “All Washed Up: The Beach Litter Problem”). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from LLOG management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE.

Accidents: Collisions between support vessels and marine mammals, including cetaceans, would be unusual events; however, should one occur, death or injury to marine mammals is possible. Contract vessel operators can avoid marine mammals and reduce potential deaths by maintaining a vigilant watch for marine mammals and maintaining a safe distance of 500 meters or greater from baleen whales, 100 meters or greater from sperm whales, and a distance of 50 meters or greater from all other aquatic protected species, with the exception of animals that approach the vessel. If unable to identify the marine mammal, the vessel will act as if it were a baleen whale and maintain a distance of 500 meters or greater. If a manatee is sighted, all vessels in the area will operate at “no wake/idle” speeds in the area, while maintaining proper distance. When assemblages of cetaceans are observed, including mother/calf pairs, vessel speeds will be reduced to 10 knots or less. Vessel personnel should use a Gulf of Mexico reference guide that includes identifying information on marine mammals, sea turtles, and other marine protected species (i.e., Endangered Species Act listed species such as Gulf sturgeon, giant manta ray, or oceanic whitetip shark) that may be encountered in the Gulf of Mexico Outer Continental Shelf (OCS).

Contract vessel operators will comply with the measures included in Appendix C of the NMFS Biological Opinion and requirements of the Protected Species Lease Stipulation, except under extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

Vessel personnel must report sightings of any injured or dead protected marine mammal species immediately, regardless of whether the injury or death is caused by their vessel, to the NMFS Southeast Marine Mammal Stranding Hotline at (877) WHALE-HELP (877-942-5343). Additional information may be found at the following website: <https://www.fisheries.noaa.gov/report>. Any injured or dead protected species should also be reported to takereport.nmfsser@noaa.gov. In addition, if the injury or death was caused by a collision with the operator’s vessel, an entrapment within the operator’s equipment or vessel (e.g. moon pool), or an entanglement within the operator’s equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment/entanglement by email to protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the

responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

These proposed operations will utilize a moon pool(s) to conduct various subsea activities as described in **Appendix I** of this plan. LLOG's contractor or company representative will provide a dedicated crew member to monitor and continually survey the moon pool area during the operations for marine mammals. If any marine mammal is detected in the moon pool, LLOG will cease operations and contact NMFS at nmfs.psoreview@noaa.gov and BSEE at protectedspecies@bsee.gov and 985-722-7902 for additional guidance and incident report information.

Oil spills have the potential to cause sublethal oil-related injuries and spill-related deaths to marine mammals. However, it is unlikely that an accidental oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). Oil spill response activities may increase vessel traffic in the area, which could impact cetacean behavior and/or distribution, thereby causing additional stress to the animals. The effect of oil dispersants on cetaceans is not known. Removing oil from the surface would reduce the likelihood of oil adhering to marine mammals. Laboratory experiments have shown that the dispersants used during the Deepwater Horizon response are cytotoxic to sperm whale cells; however, it is difficult to determine actual exposure levels in the GOM. Therefore, dispersants will only be used if approved by the Regional Response Team in coordination with the RRT Dispersant Plan and RRT Biological Assessment for Dispersants. The acute toxicity of oil dispersant chemicals included in LLOG's OSRP is considered to be low when compared with the constituents and fractions of crude oils and diesel products. The activities proposed in this plan will be covered by LLOG's OSRP (refer to information submitted in accordance with **Appendix H**).

The NMFS Office of Protected Resources coordinates agency assessment of the need for response and leads response efforts for spills that may impact cetaceans. If a spill may impact cetaceans, NMFS Protected Resources Contacts should be notified (see contact details below), and they will initiate notification of other relevant parties.

NMFS Protected Resources Contacts for the Gulf of Mexico:

- Marine mammals – Southeast emergency stranding hotline 1-877-433-8299
- Other endangered or threatened species – ESA section 7 consulting biologist: nmfs.ser.emergency.consult@noaa.gov

There are no other IPFs (including physical disturbances to the seafloor) from the proposed operations that are likely to impact marine mammals.

8. Sea Turtles

GulfCet II studies sighted most loggerhead, Kemp's ridley and leatherback sea turtles over shelf waters. Historically these species have been sighted up to the shelf's edge. They appear to be more abundant east of the Mississippi River than they are west of the river (Fritts et al., 1983b; Lohoefer et al., 1990). Deep waters may be used by all species as a transitory habitat. A complete list of endangered and threatened sea turtles in the GOM may be found in **Table 1** at the beginning of this Environmental Impact Assessment. Additional details regarding the loggerhead sea turtle's critical habitat in the GOM are located in **Item 20.5**. Potential IPFs to sea turtles as a result of the proposed operations include emissions (noise / sound), effluents, discarded trash and debris, and accidents.

Emissions (noise / sound): Noise from drilling activities, support vessels, and helicopters (i.e., non-impulsive anthropogenic sound) may elicit a startle reaction from sea turtles, but this is a temporary disturbance. Responses to sound exposure may include lethal or nonlethal injury, temporary hearing impairment, behavioral harassment and stress, or no apparent response. Vessels are the greatest contributors to increases in low-frequency ambient sound in the sea (Andrew et al. 2011). Sound levels and tones produced are generally related to vessel size and speed. Larger vessels generally emit more sound than smaller vessels, and vessels underway with a full load, or those pushing or towing a load, are noisier than unladen vessels. Routine OCS helicopter traffic would not be expected to disturb animals for extended periods, provided pilots do not alter their flight patterns to more closely observe or photograph marine mammals. Helicopters, while flying offshore, generally maintain altitudes above 700 feet during transit to and from a working area, and at an altitude of about 500 feet between platforms. The duration of the effects resulting from a startle response is expected to be short-term during routine flights and the potential effects will be insignificant to sea turtles. Therefore, we find that any disturbance that may result from aircraft associated with the proposed action is not likely to adversely affect sea turtles. Construction and operational sounds other than pile driving should have insignificant effects on sea turtles; effects would be limited to short-term avoidance of construction activity itself rather than the sound produced. As a result, sound sources associated with support vessel movement as part of the proposed operations are insignificant and therefore are not likely to adversely affect sea turtles.

Overall noise impacts on sea turtles from the proposed activities are expected to be negligible to minor depending on the location of the animal(s) relative to the sound source and the frequency, intensity, and duration of the source. The National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion Appendix C explains how operators must implement measures to minimize the risk of vessel strikes to protected species and report observations of injured or dead protected species. This guidance should also minimize the chance of sea turtles being subject to the increased noise level of a service vessel in very close proximity.

Effluents: Drilling fluids and cuttings discharges are not known to be lethal to sea turtles. Most operational discharges are diluted and dispersed upon release. Any potential impact from drilling fluids would be indirect, either as a result of impacts on prey items or possibly through ingestion in the food chain (API, 1989).

Discarded trash and debris: Both entanglement in, and ingestion of, debris have caused the death or serious injury of sea turtles (Balazs, 1985). The limited amount of marine debris, if any, resulting from the proposed activities is not expected to substantially harm sea turtles. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V, the Marine Plastic Pollution Research and Control Act, and regulations imposed by various agencies, including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA).

LLOG will operate in accordance with the regulations, agency guidance, and Appendix B of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass. LLOG will also collect and remove flotsam resulting from activities related to proposed operations.

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), “Think About It” (*previously “All Washed Up: The Beach Litter Problem”*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from LLOG management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE.

Accidents: Collisions between support vessels and sea turtles would be unusual events; however, should one occur, death or injury to sea turtles is possible. Contract vessel operators can avoid sea turtles and reduce potential deaths by maintaining a vigilant watch for sea turtles and maintaining a safe distance of 50 meters or greater when they are sighted, with the exception of sea turtles that approach the vessel. Vessel crews should use a reference guide to help identify the five species of sea turtles that may be encountered in the Gulf of Mexico OCS as well as other marine protected species (i.e., Endangered Species Act listed species). Contract

vessel operators will comply with the measures included in Appendix C of the NMFS Biological Opinion and requirements of the Protected Species Lease Stipulation, except under extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

Vessel crews must report sightings of any injured or dead protected sea turtle species immediately, regardless of whether the injury or death is caused by their vessel, to the State Coordinators for the Sea Turtle Stranding and Salvage Network (STSSN) at http://www.sefsc.noaa.gov/species/turtles/stranding_coordinators.htm (phone numbers vary by state). Additional information may be found at the following website: <https://www.fisheries.noaa.gov/report>. Any injured or dead protected species should also be reported to takereport.nmfs@noaa.gov. In addition, if the injury or death was caused by a collision with the operator's vessel, an entrapment within the operator's equipment or vessel (e.g. moon pool), or an entanglement within the operator's equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment/entanglement by email to protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

These proposed operations will utilize a moon pool(s) to conduct various subsea activities as described in **Appendix I** of this plan. LLOG's contractor or company representative will provide a dedicated crew member to monitor and continually survey the moon pool area during the operations for sea turtles. If any sea turtle is detected in the moon pool, LLOG will cease operations and contact NMFS at nmfs.psoreview@noaa.gov and BSEE at protectedspecies@bsee.gov and 985-722-7902 for additional guidance and incidental report information. The procedures found in Appendix J of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion will be employed to free entrapped or entangled marine life safely.

All sea turtle species and their life stages are vulnerable to the harmful effects of oil through direct contact or by fouling of their food. Exposure to oil can be fatal, particularly to juveniles and hatchlings. However, it is unlikely that an accidental oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). Oil spill response activities may increase vessel traffic in the area, which could add to the possibility of collisions with sea turtles. The activities proposed in this plan will be covered by LLOG's Regional Oil Spill Response Plan (refer to information submitted in accordance with **Appendix H**).

The NMFS Office of Protected Resources coordinates agency assessment of the need for response and leads response efforts for spills that may impact sea turtles. If a spill may impact

sea turtles, the following NMFS Protected Resources Contacts should be notified, and they will initiate notification of other relevant parties.

- Dr. Brian Stacy at brian.stacy@noaa.gov and 352-283-3370 (cell); or
- Stacy Hargrove at stacy.hargrove@noaa.gov and 305-781-7453 (cell)

There are no other IPFs (including physical disturbances to the seafloor) from the proposed operations that are likely to impact sea turtles.

9. Air Quality

Potential IPFs to air quality as a result of the proposed operations include accidents.

Mississippi Canyon Block 546 is located 71.7 miles from the Breton Wilderness Area and 38 miles from shore. Applicable emissions data is included in **Appendix G** of this plan.

There would be a limited degree of air quality degradation in the immediate vicinity of the proposed activities. Plan Emissions for the proposed activities do not exceed the annual exemption levels as set forth by BOEM. Accidents and blowouts can release hydrocarbons or chemicals, which could cause the emission of air pollutants. However, these releases would not impact onshore air quality because of the prevailing atmospheric conditions, emission height, emission rates, and the distance of Mississippi Canyon Block 546 from the coastline.

There are no other IPFs (including effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact air quality.

10. Shipwreck Sites (known or potential)

In accordance with BOEM NTL 2005-G07, LLOG will submit an archaeological resource report per 30 CFR 550.194 if directed to do so by the Regional Director.

Potential IPFs to known or unknown shipwreck sites as a result of the proposed operations in Mississippi Canyon Block 546 include physical disturbances to the seafloor and accidents.

Physical disturbances to the seafloor: A Drillship or DP semi-submersible is being used for the proposed activities; therefore, only an insignificant amount of seafloor will be disturbed. Because physical disturbances to the seafloor will be minimized by the use of a Drillship or DP semi-submersible, LLOG's proposed operations in Mississippi Canyon Block 546 are not likely to impact shipwreck sites.

Additionally, Mississippi Canyon Block 546 is not located in or adjacent to an OCS block designated by BOEM as having a high probability for occurrence of shipwrecks. Should LLOG

discover any evidence of a shipwreck, they will immediately halt operations within a 1000-foot radius, report to BOEM within 48 hours, and make every reasonable effort to preserve and protect that cultural resource.

Accidents: An accidental oil spill has the potential to cause some detrimental effects to shipwreck sites if the release were to occur subsea. However, it is unlikely that an accidental oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). The activities proposed in this plan will be covered by LLOG's Regional Oil Spill Response Plan (refer to information submitted in accordance with **Appendix H**).

There are no other IPFs (including emissions, effluents, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact shipwreck sites.

11. Prehistoric Archaeological Sites

In accordance with BOEM NTL 2005-G07, LLOG will submit an archaeological resource report per 30 CFR 550.194 if directed to do so by the Regional Director.

Potential IPFs to prehistoric archaeological sites as a result of the proposed operations in Mississippi Canyon Block 546 are physical disturbances to the seafloor and accidents. Should LLOG discover any object of prehistoric archaeological significance, they will immediately halt operations within a 1000-foot radius, report to BOEM within 48 hours, and make every reasonable effort to preserve and protect that cultural resource.

Physical Disturbances to the seafloor: Although the operations proposed will be conducted by utilizing a Drillship or DP semi-submersible, which would cause only an insignificant amount of seafloor to be disturbed, Mississippi Canyon Block 546 is located inside the Archaeological Prehistoric high probability lines. LLOG will report to BOEM the discovery of any object of prehistoric archaeological significance and make every reasonable effort to preserve and protect that cultural resource.

Accidents: An accidental oil spill has the potential to cause some detrimental effects to prehistoric archaeological sites if the release were to occur subsea. However, it is unlikely that an accidental oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). The activities proposed in this plan will be covered by LLOG's Regional Oil Spill Response Plan (refer to information submitted in accordance with **Appendix H**).

There are no other IPFs (including emissions, effluents, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact prehistoric archeological sites.

Vicinity of Offshore Location

12. Essential Fish Habitat (EFH)

Potential IPFs to EFH as a result of the proposed operations in Mississippi Canyon Block 546 include physical disturbances to the seafloor, effluents, and accidents. EFH includes all estuarine and marine waters and substrates in the Gulf of Mexico.

Physical disturbances to the seafloor: Turbidity and sedimentation resulting from the bottom disturbing activities included in the proposed operations would be short term and localized. Fish are mobile and would avoid these temporarily suspended sediments. Additionally, the Live Bottom Low Relief Stipulation, the Live Bottom (Pinnacle Trend) Stipulation, and the Eastern Gulf Pinnacle Trend Stipulation have been put in place to minimize the impacts of bottom disturbing activities. Additionally, a Drillship or DP semi-submersible is being used for the proposed activities; therefore, only an insignificant amount of seafloor will be disturbed. Therefore, the bottom disturbing activities from the proposed operations would have a negligible impact on EFH.

Effluents: The Live Bottom Low Relief Stipulation, the Live Bottom (Pinnacle Trend) Stipulation, and the Eastern Gulf Pinnacle Trend Stipulation would prevent most of the potential impacts on live-bottom communities and EFH from operational waste discharges. Levels of contaminants in drilling muds and cuttings and produced-water discharges, discharge-rate restrictions, and monitoring and toxicity testing are regulated by the EPA NPDES permit, thereby eliminating many significant biological or ecological effects. Operational discharges are not expected to cause significant adverse impacts to EFH.

Accidents: An accidental oil spill has the potential to cause some detrimental effects on EFH. Oil spills that contact coastal bays and estuaries, as well as OCS waters when pelagic eggs and larvae are present, have the greatest potential to affect fisheries. However, it is unlikely that an oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). The activities proposed in this plan will be covered by LLOG's Regional OSRP (refer to information submitted in **Appendix H**).

There are no other IPFs (including emissions and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact essential fish habitat.

13. Marine and Pelagic Birds

Potential IPFs to marine birds as a result of the proposed activities include emissions (air, noise / sound), accidental oil spills, and discarded trash and debris from vessels and the facilities.

Emissions:

Air Emissions

Emissions of pollutants into the atmosphere from these activities are far below concentrations which could harm coastal and marine birds.

Noise / Sound Emissions

The OCS oil-and gas-related helicopters and vessels have the potential to cause noise and disturbance. However, flight altitude restrictions over sensitive habitat, including that of birds, may make serious disturbance unlikely. Birds are also known to habituate to noises, including airport noise. It is an assumption that the OCS oil-and gas-related vessel traffic would follow regular routes; if so, seabirds would find the noise to be familiar. Therefore, the impact of OCS oil-and gas-related noise from helicopters and vessels to birds would be expected to be negligible.

The use of explosives for decommissioning activities may potentially kill one or more birds from barotrauma if a bird (or several birds because birds may occur in a flock) is present at the location of the severance. For the impact of underwater sound, a threshold of 202 dB sound exposure level (SEL) for injury and 208 dB SEL for barotrauma was recommended for the *Brahyramphus marmoratus*, a diving seabird (USDOJ, FWS, 2011). However, the use of explosive severance of facilities for decommissioning are not included in these proposed operations, therefore these impacts are not expected.

Accidents: An oil spill would cause localized, low-level petroleum hydrocarbon contamination. However, it is unlikely that an oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). Marine and pelagic birds feeding at the spill location may experience chronic, nonfatal, physiological stress. It is expected that few, if any, coastal and marine birds would actually be affected to that extent. The activities proposed in this plan will be covered by LLOG's Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: Marine and pelagic birds could become entangled and snared in discarded trash and debris, or ingest small plastic debris, which can cause permanent injuries and death. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V, the Marine Plastic Pollution Research and Control Act, and regulations imposed by various agencies, including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA).

LLOG will operate in accordance with the regulations, agency guidance, and Appendix B of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling

and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass. LLOG will also collect and remove flotsam resulting from activities related to proposed operations.

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), “Think About It” (previously “All Washed Up: The Beach Litter Problem”). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from LLOG management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE. Debris, if any, from these proposed activities will seldom interact with marine and pelagic birds; therefore, the effects will be negligible.

ESA bird species: Seven species found in the GOM are listed under the ESA. BOEM consults on these species and requires mitigations that would decrease the potential for greater impacts due to small population size.

There are no other IPFs (including effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact marine and pelagic birds.

14. Public Health and Safety Due to Accidents.

There are no IPFs (including emissions, effluents, physical disturbances to the seafloor, wastes sent to shore for treatment or disposal, and accidents, including an accidental H₂S release) from the proposed activities that are likely to impact public health and safety. In accordance with NTL No.’s 2008-G04, 2009-G27, and 2009-G31, sufficient information is included in **Appendix D** to justify our request that our proposed operations be classified by BSEE as H₂S absent.

Coastal and Onshore

15. Beaches

Potential IPFs to beaches from the proposed operations include accidents and discarded trash and debris.

Accidents: Oil spills contacting beaches would have impacts on the use of recreational beaches and associated resources. Due to the distance from shore (38 miles) and the response capabilities that would be implemented, no significant adverse impacts are expected. The operations proposed in this plan will be covered by LLOG’s Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: Trash on the beach is recognized as a major threat to the enjoyment and use of beaches. There will only be a limited amount of marine debris, if any, resulting from the proposed activities. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V, the Marine Plastic Pollution Research and Control Act, and regulations imposed by various agencies, including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA).

LLOG will operate in accordance with the regulations, agency guidance, and Appendix B of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass. LLOG will also collect and remove flotsam resulting from activities related to proposed operations.

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), “Think About It” (*previously “All Washed Up: The Beach Litter Problem”*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from LLOG management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE.

There are no other IPFs (including emissions, effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact beaches.

16. Wetlands

Potential IPFs to wetlands from the proposed operations include accidents and discarded trash and debris.

Accidents: It is unlikely that an oil spill would occur from the proposed activities (refer to **Item 5, Water Quality**). Due to the distance from shore (38 miles) and the response capabilities that would be implemented, no impacts are expected. The operations proposed in this plan will be covered by LLOG’s Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: There will only be a limited amount of marine debris, if any, resulting from the proposed activities. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V, the Marine Plastic Pollution Research and Control Act, and regulations imposed by various agencies, including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA).

LLOG will operate in accordance with the regulations, agency guidance, and Appendix B of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass. LLOG will also collect and remove flotsam resulting from activities related to proposed operations.

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), “Think About It” (*previously “All Washed Up: The Beach Litter Problem”*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from LLOG management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE.

There are no other IPFs (including emissions, effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact wetlands.

17. Shore Birds and Coastal Nesting Birds

Potential IPFs to shore birds and coastal nesting birds as a result of the proposed operations include accidents and discarded trash and debris.

Accidents: Oil spills could cause impacts to shore birds and coastal nesting birds. However, it is unlikely that an oil spill would occur from the proposed activities (refer to **Item 5**, Water Quality). Given the distance from shore (38 miles) and the response capabilities that would be implemented, no impacts are expected. The operations proposed in this plan will be covered by LLOG’s Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: Shore birds and coastal nesting birds are highly susceptible to entanglement in floating, submerged, and beached marine debris: specifically, plastics. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V, the Marine Plastic Pollution Research and Control Act, and regulations imposed by various agencies including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA).

LLOG will operate in accordance with the regulations, agency guidance, and Appendix B of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass. LLOG will also collect and remove flotsam resulting from activities related to proposed operations.

Informational placards will be posted on vessels and every facility that has sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), “Think About It” (*previously “All Washed Up: The Beach Litter Problem”*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from LLOG management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE.

There are no other IPFs (including emissions, effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact shore birds and coastal nesting birds.

18. Coastal Wildlife Refuges

Potential IPFs to coastal wildlife refuges as a result of the proposed operations include accidents and discarded trash and debris.

Accidents: An accidental oil spill from the proposed activities could cause impacts to coastal wildlife refuges. However, it is unlikely that an oil spill would occur from the proposed activities (refer to Item 5, Water Quality). Due to the distance from shore (38 miles) and the response capabilities that would be implemented, no impacts are expected. The operations proposed in this plan will be covered by LLOG’s Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V, the Marine Plastic Pollution Research and Control Act and regulations imposed by various agencies, including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA).

LLOG will operate in accordance with the regulations, agency guidance, and Appendix B of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass. LLOG will also collect and remove flotsam resulting from activities related to proposed operations.

Informational placards will be posted on vessels and every facility that has sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), “Think About It” (*previously “All Washed Up: The Beach Litter Problem”*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from LLOG management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE.

There are no other IPFs (including emissions, effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact coastal wildlife refuges.

19. Wilderness Areas

Potential IPFs to wilderness areas as a result of the proposed operations include accidents and discarded trash and debris.

Accidents: An accidental oil spill from the proposed activities could cause impacts to wilderness areas. However, it is unlikely that an oil spill would occur from the proposed operations (refer to **Item 5**, Water Quality). Due to the distance from the nearest designated Wilderness Area (71.7 miles) and the response capabilities that would be implemented, no significant adverse impacts are expected. The operations proposed in this plan will be covered by LLOG’s Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V, the Marine Plastic Pollution Research and Control Act and regulations imposed by various agencies including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA).

LLOG will operate in accordance with the regulations, agency guidance, and Appendix B of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass. LLOG will also collect and remove flotsam resulting from activities related to proposed operations.

Informational placards will be posted on vessels and every facility that has sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), “Think About It” (*previously “All Washed Up: The Beach Litter Problem”*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from LLOG management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE.

There are no other IPFs (including emissions, effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact wilderness areas.

20. Other Environmental Resources Identified

20.1 – Rice’s Whale (née Gulf of Mexico Bryde’s Whale)

The Bryde’s whale, also known as the Bryde’s whale complex, is a collection of baleen whales that are still being researched to determine if they are the same species or if they are individual species of whales. In 2021, the Rice’s whale, formerly known as the Gulf of Mexico Bryde’s whale, was determined to be a separate species from other Bryde’s whales. There are less than 100 Rice’s whales living in the Gulf of Mexico year-round. These whales retain all the protections of the Gulf of Mexico Bryde’s whale under the Endangered Species Act while the regulations are being updated to reflect the name change.

The Rice’s whale (née Gulf of Mexico Bryde’s whale) is the only commonly occurring baleen whale in the northern Gulf of Mexico and has been sighted off western Florida and in the De

Soto Canyon region. The Rice's whale area is over 70.3 miles from the proposed operations. Additionally, vessel traffic associated with the proposed operations will not flow through the Rice's whale area. Therefore, there are no IPFs from the proposed operations that are likely to impact the Rice's whale. Additional information on marine mammals may be found in **Item 7**.

20.2 – Gulf Sturgeon

The Gulf sturgeon resides primarily in inland estuaries and rivers from Louisiana to Florida and a small population of the species enters the Gulf of Mexico seasonally in western Florida. Potential IPFs to the Gulf sturgeon from the proposed operations include accidents, emissions (noise / sound), and discarded trash and debris. Additional information on ESA-listed fish may be found in **Item 6**.

Accidents: Collisions between support vessels and the Gulf sturgeon would be unusual events; however, should one occur, death or injury to the Gulf sturgeon is possible. Contract vessel operators can avoid protected aquatic species and reduce potential deaths by maintaining a vigilant watch and a distance of 50 meters or greater, with the exception of animals that approach the vessel. Vessel personnel should use a Gulf of Mexico reference guide that includes identifying information on marine mammals, sea turtles, and other marine protected species (i.e., Endangered Species Act listed species such as Gulf sturgeon, giant manta ray, or oceanic whitetip shark) that may be encountered in the Gulf of Mexico Outer Continental Shelf (OCS).

Contract vessel operators will comply with the measures included in Appendix C of the NMFS Biological Opinion and requirements of the Protected Species Lease Stipulation, except under extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

Should an ESA-listed fish (e.g., giant manta ray, oceanic whitetip shark, or Gulf sturgeon) be entrapped, entangled, or injured, personnel should contact the ESA Section 7 biologist at (301) 427-8413 (nmfs.psoreview@noaa.gov) and report all incidents to takereport.nmfs@noaa.gov. After making the appropriate notifications, LLOG may call BSEE at (985) 722-7902 for questions or additional guidance on recovery assistance needs, continued monitoring requirements, and incidental report information which at minimum is detailed below. Additional information may be found at the following website: <https://www.fisheries.noaa.gov/report>. Any injured or dead protected species should also be reported to takereport.nmfs@noaa.gov. In addition, if the injury or death was caused by a collision with the operator's vessel, an entrapment within the operator's equipment or vessel (e.g. moon pool), or an entanglement within the operator's equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment/entanglement by email to protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the

responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

Due to the distance from the nearest identified Gulf sturgeon critical habitat (15 miles) and the response capabilities that would be implemented during a spill, no significant adverse impacts are expected to the Gulf sturgeon. Considering the information from the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion, the location of this critical habitat in relation to proposed operations, the likely dilution of oil reaching nearshore areas, and the on-going weathering and dispersal of oil over time, we do not anticipate the effects from oil spills will appreciably diminish the value of Gulf sturgeon designated critical habitat for the conservation of the species. The operations proposed in this plan will be covered by LLOG's Regional OSRP (refer to information submitted in **Appendix H**).

Emissions (noise / sound): All routine OCS oil-and gas-related activities have some element of sound generation. Common sound sources include propeller cavitation, rotating machinery, and reciprocating machinery, which are associated with routine OCS oil-and gas-related activities such as vessel traffic, drilling, construction, and oil and gas production, processing, and transport. Sound introduced into the marine environment as a result of human activities has the potential to affect marine organisms. The National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion found that construction and operational sounds other than pile driving will have insignificant effects on Gulf sturgeon (NMFS, 2020). There are no pile driving activities associated with the proposed operations, therefore noise impacts are not expected to significantly affect Gulf sturgeon.

Discarded trash and debris: Trash and debris are not expected to impact the Gulf sturgeon. There will only be a limited amount of marine debris, if any, resulting from the proposed activities. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V, the Marine Plastic Pollution Research and Control Act, and regulations imposed by various agencies including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA).

LLOG will operate in accordance with the regulations, agency guidance, and Appendix B of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass. LLOG will also collect and remove flotsam resulting from activities related to proposed operations.

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), “Think About It” (previously “All Washed Up: The Beach Litter Problem”). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from LLOG management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE.

There are no other IPFs (including effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact the Gulf sturgeon.

20.3 – Oceanic Whitetip Shark

Oceanic whitetip sharks may be found in tropical and subtropical waters around the world, including the Gulf of Mexico (Young 2016). According to the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion, Essential Fish Habitat (EFH) for the oceanic whitetip shark includes localized areas in the central Gulf of Mexico and Florida Keys. Oceanic whitetip sharks were listed as threatened under the Endangered Species Act in 2018 due to worldwide overfishing. Oceanic whitetip sharks had an abundant worldwide population, which has been threatened in recent years by inadequate regulatory measures governing fisheries; therefore, there is little research regarding the impact of oil and gas operations on oceanic whitetip sharks (NMFS, 2020). IPFs that have been determined by NMFS to be discountable to oceanic whitetip sharks include vessel strike, emissions (noise / sound), discharges, entanglement and entrapment, and marine debris. Potential IPFs to oceanic whitetip sharks as a result of the proposed operations in Mississippi Canyon Block 546 include accidents. Additional information on ESA-listed fish may be found in **Item 6**.

Accidents: Collisions between support vessels and the oceanic whitetip shark would be unusual events, however, should one occur, death or injury to the oceanic whitetip shark is possible. Contract vessel operators can avoid protected aquatic species and reduce potential deaths by maintaining a vigilant watch and a distance of 50 meters or greater, with the exception of animals that approach the vessel. Vessel personnel should use a Gulf of Mexico reference guide that includes identifying information on marine mammals, sea turtles, and other marine protected species (i.e., Endangered Species Act listed species such as Gulf sturgeon, giant manta ray, or oceanic whitetip shark) that may be encountered in the Gulf of Mexico Outer Continental Shelf (OCS).

Contract vessel operators will comply with the measures included in Appendix C of the NMFS Biological Opinion and requirements of the Protected Species Lease Stipulation, except under extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

Should an ESA-listed fish (e.g., giant manta ray, oceanic whitetip shark, or Gulf sturgeon) be entrapped, entangled, or injured, personnel should contact the ESA Section 7 biologist at (301) 427-8413 (nmfs.psoreview@noaa.gov) and report all incidents to takereport.nmfs@noaa.gov. After making the appropriate notifications, LLOG may call BSEE at (985) 722-7902 for questions or additional guidance on recovery assistance needs, continued monitoring requirements, and incidental report information which at minimum is detailed below. Additional information may be found at the following website: <https://www.fisheries.noaa.gov/report>. Any injured or dead protected species should also be reported to takereport.nmfs@noaa.gov. In addition, if the injury or death was caused by a collision with the operator's vessel, an entrapment within the operator's equipment or vessel (e.g. moon pool), or an entanglement within the operator's equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment/entanglement by email to protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

There is little information available on the impacts of oil spills or dispersants on oceanic whitetip sharks. It is expected that exposure of oil or dispersants to oceanic whitetip sharks would likely result in effects similar to other marine species, including fitness reduction and the possibility of mortality (NMFS, 2020). Due to the sparse population in the Gulf of Mexico, it is possible that a small number of oceanic whitetip sharks could be impacted by an oil spill. However, it is unlikely that such an event would occur from the proposed activities (refer to **Item 5**, Water Quality). The operations proposed in this plan will be covered by LLOG's Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: There is little available information on the effects of marine debris on oceanic whitetip sharks. Since these sharks are normally associated with surface waters, they may be susceptible to entanglement. However, due to the small, widely dispersed, and highly mobile population in the Gulf of Mexico, and the localized and patchy distribution of marine debris, it is extremely unlikely that oceanic whitetip sharks would be impacted by marine debris.

There will only be a limited amount of marine debris, if any, resulting from the proposed activities. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V, the Marine Plastic Pollution Research and Control Act, and regulations

imposed by various agencies, including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA).

LLOG will operate in accordance with the regulations, agency guidance, and Appendix B of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass. LLOG will also collect and remove flotsam resulting from activities related to proposed operations.

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), “Think About It” (*previously “All Washed Up: The Beach Litter Problem”*). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from LLOG management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE.

There are no IPFs (including effluents, physical disturbances to the seafloor, and wastes sent to shore for treatment or disposal) from the proposed operations that are likely to impact oceanic whitetip sharks.

20.4 – Giant Manta Ray

According to the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion, the giant manta ray lives in tropical, subtropical, and temperate oceanic waters and productive coastlines throughout the Gulf of Mexico. While uncommon in the Gulf of Mexico, there is a population of approximately 70 giant manta rays in the Flower Garden Banks National Marine Sanctuary (Miller and Klimovich 2017). Giant manta rays were listed as threatened under the Endangered Species Act in 2018 due to worldwide overfishing. Giant manta rays had an abundant worldwide population, which has been threatened in recent years by inadequate regulatory measures governing fisheries; therefore, there is little research regarding the impact of oil and gas operations on giant manta rays (NMFS, 2020). IPFs that have been determined by NMFS to be discountable to giant manta rays include vessel strike, emissions (noise / sound), discharges, entanglement and entrapment, and marine debris. Potential IPFs to giant manta rays as a result of the proposed operations in Mississippi Canyon Block 546 include accidents. Additional information on ESA-listed fish may be found in **Item 6**.

Accidents: Collisions between support vessels and the giant manta ray would be unusual events, however, should one occur, death or injury to the giant manta ray is possible. Contract vessel operators can avoid protected aquatic species and reduce potential deaths by maintaining a vigilant watch and a distance of 50 meters or greater, with the exception of animals that approach the vessel. Vessel personnel should use a Gulf of Mexico reference guide that includes identifying information on marine mammals, sea turtles, and other marine protected species (i.e., Endangered Species Act listed species such as Gulf sturgeon, giant manta ray, or oceanic whitetip shark) that may be encountered in the Gulf of Mexico Outer Continental Shelf (OCS).

Contract vessel operators will comply with the measures included in Appendix C of the NMFS Biological Opinion and requirements of the Protected Species Lease Stipulation, except under extraordinary circumstances when the safety of the vessel or crew is in doubt or the safety of life at sea is in question.

Should an ESA-listed fish (e.g., giant manta ray, oceanic whitetip shark, or Gulf sturgeon) be entrapped, entangled, or injured, personnel should contact the ESA Section 7 biologist at (301) 427-8413 (nmfs.psoreview@noaa.gov) and report all incidents to takereport.nmfs@noaa.gov. After making the appropriate notifications, LLOG may call BSEE at (985) 722-7902 for questions or additional guidance on recovery assistance needs, continued monitoring requirements, and incidental report information which at minimum is detailed below. Additional information may be found at the following website: <https://www.fisheries.noaa.gov/report>. Any injured or dead protected species should also be reported to takereport.nmfs@noaa.gov. In addition, if the injury or death was caused by a collision with the operator's vessel, an entrapment within the operator's equipment or vessel (e.g. moon pool), or an entanglement within the operator's equipment, the operator must further notify BOEM and BSEE within 24 hours of the strike or entrapment/entanglement by email to protectedspecies@boem.gov and protectedspecies@bsee.gov. If the vessel is the responsible party, it is required to remain available to assist the respective salvage and stranding network as needed.

There is little information available on the impacts of oil spills or dispersants on giant manta rays. It is expected that exposure of oil or dispersants to giant manta rays would likely result in effects similar to other marine species, including fitness reduction and the possibility of mortality (NMFS, 2020). It is possible that a small number of giant manta rays could be impacted by an oil spill in the Gulf of Mexico. However, due to the distance to the Flower Garden Banks (178.3 miles), the low population dispersed throughout the Gulf of Mexico, and the response capabilities that would be implemented during a spill, no significant adverse impacts are expected to impact giant manta rays. Additionally, it is unlikely that such an event

would occur from the proposed activities (refer to **Item 5**, Water Quality). The operations proposed in this plan will be covered by LLOG's Regional OSRP (refer to information submitted in **Appendix H**).

Discarded trash and debris: There is little available information on the effects of marine debris on giant manta rays. Since these sharks are normally associated with surface waters, they may be susceptible to entanglement. However, due to the small, widely dispersed, and highly mobile population in the Gulf of Mexico, and the localized and patchy distribution of marine debris, it is extremely unlikely that oceanic whitetip sharks would be impacted by marine debris.

There will only be a limited amount of marine debris, if any, resulting from the proposed activities. Operators are prohibited from deliberately discharging debris as mandated by MARPOL-Annex V, the Marine Plastic Pollution Research and Control Act, and regulations imposed by various agencies, including the United States Coast Guard (USCG) and the Environmental Protection Agency (EPA).

LLOG will operate in accordance with the regulations, agency guidance, and Appendix B of the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion and also avoid accidental loss of solid waste items by maintaining waste management plans, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. Special caution will be exercised when handling and disposing of small items and packaging materials, particularly those made of non-biodegradable, environmentally persistent materials such as plastic or glass. LLOG will also collect and remove flotsam resulting from activities related to proposed operations.

Informational placards will be posted on all vessels and facilities having sleeping or food preparation capabilities. All offshore personnel, including contractors and other support services-related personnel (e.g., helicopter pilots, vessel captains and boat crews) will be indoctrinated on waste procedures, and will view the video (or Microsoft PowerPoint presentation), "Think About It" (previously "All Washed Up: The Beach Litter Problem"). Thereafter, all personnel will view the marine trash and debris training video annually. Offshore personnel will also receive an explanation from LLOG management or the designated lease operator management that emphasizes their commitment to waste management in accordance with NTL No. 2015-G03-BSEE.

There are no other IPFs (including effluents, physical disturbances to the seafloor, and wastes sent to shore for disposal) from the proposed operations that are likely to impact giant manta rays.

20.5 – Loggerhead Sea Turtle

The loggerhead sea turtles are large sea turtles that inhabit continental shelf and estuarine environments throughout the temperate and tropical regions of the Atlantic Ocean, with nesting beaches along the northern and western Gulf of Mexico. NMFS issued a Final Rule in 2014 (79 FR 39855) designating a critical habitat including 38 marine areas within the Northwest Atlantic Ocean, with seven of those areas residing within the Gulf of Mexico. These areas contain one or a combination of habitat types: nearshore reproductive habitats, winter areas, breeding areas, constricted migratory corridors, and/or *Sargassum* habitats.

There are multiple IPFs that may impact loggerhead sea turtles (see **Item 8**). However, the closest loggerhead critical habitat is located 126.7 miles from Mississippi Canyon Block 546; therefore, no adverse impacts are expected to the critical habitat. Additionally, considering the information from the National Marine Fisheries Service Endangered Species Act (ESA) Section 7 Biological Opinion, we do not expect proposed operations to affect the ability of *Sargassum* to support adequate prey abundance and cover for loggerhead turtles.

20.6 - Protected Corals

Protected coral habitats in the Gulf of Mexico range from Florida, the Flower Garden Banks National Marine Sanctuary, and into the Caribbean, including Puerto Rico, the U.S. Virgin Islands, and Navassa Island. Four counties in Florida (Palm Beach, Broward, Miami-Dade, and Monroe Counties) were designated as critical habitats for elkhorn (*Acropora palmata*) and staghorn (*Acropora cervicornis*) corals. These coral habitats are located outside of the planning area and are not expected to be impacted by the proposed actions. Elkhorn coral can also be found in the Flower Garden Banks along with three additional coral species, boulder star coral (*Orbicella franksi*), lobed star coral (*Orbicella annularis*), and mountainous star coral (*Orbicella faveolata*). Potential IPFs to protected corals from the proposed operations include accidents.

Accidents: It is unlikely that an accidental surface or subsurface spill would occur from the proposed operations (refer to statistics in **Item 5**, Water Quality). Oil spills cause damage to corals only if the oil contacts the organisms. Due to the distance from the Flower Garden Banks (178.3 miles) and other critical coral habitats, no adverse impacts are expected. The operations proposed in this plan will be covered by LLOG's Regional OSRP (refer to information submitted in **Appendix H**).

There are no other IPFs (including emissions, effluents, physical disturbances to the seafloor, and wastes sent to shore for disposal) from the proposed operations that are likely to impact protected corals.

20.7 - Endangered Beach Mice

There are four subspecies of endangered beach mouse that are found in the dune systems along parts of Alabama and northwest Florida. Due to the location of Mississippi Canyon Block 546 and the beach mouse critical habitat (above the intertidal zone), there are no IPFs that are likely to impact endangered beach mice.

20.8 - Navigation

The current system of navigation channels around the northern GOM is believed to be generally adequate to accommodate traffic generated by the future Gulfwide OCS Program. As exploration and development activities increase on deepwater leases in the GOM, port channels may need to be expanded to accommodate vessels with deeper drafts and longer ranges. However, current navigation channels will not be changed, and new channels will not be required as a result of the operations proposed in this plan.

(C) IMPACTS ON PROPOSED ACTIVITIES

The site-specific environmental conditions have been taken into account for the proposed activities. No impacts are expected on the proposed operations from site-specific environmental conditions.

(D) ENVIRONMENTAL HAZARDS

During the hurricane season, June through November, the Gulf of Mexico is impacted by an average of ten tropical storms (39-73 mph winds), of which six become hurricanes (> 74 mph winds). Due to its location in the Gulf, Mississippi Canyon Block 546 may experience hurricane and tropical storm force winds and related sea currents. These factors can adversely impact the integrity of the operations covered by this plan. A significant storm may present physical hazards to operators and vessels, damage exploration or production equipment, or result in the release of hazardous materials (including hydrocarbons). Additionally, the displacement of equipment may disrupt the local benthic habitat and pose a threat to local species.

The following preventative measures included in this plan may be implemented to mitigate these impacts:

1. Drilling & completion
 - a. Secure well
 - b. Secure rig / platform
 - c. Evacuate personnel

Drilling activities will be conducted in accordance with NTL No.'s 2008-G09, 2009-G10, and 2010-N10.

2. Structure Installation

Operator will not conduct structure installation operations during Tropical Storm or Hurricane threat.

(E) ALTERNATIVES

No alternatives to the proposed operations were considered to reduce environmental impacts.

(F) MITIGATION MEASURES

No mitigation measures other than those required by regulation will be employed to avoid, diminish, or eliminate potential impacts on environmental resources.

(G) CONSULTATION

No agencies or persons were consulted regarding potential impacts associated with the proposed operations. Therefore, a list of such entities has not been provided.

(H) PREPARER(S)

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(I) REFERENCES

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APPENDIX R

ADMINISTRATIVE INFORMATION

A. EXEMPTED INFORMATION

Proprietary information included in the proprietary copy of this Development Operations Coordination Document

- BHL, TVD and MD information on form BOEM 0137 (OCS Plan Information Form)
- Production Rates and Life of Reserves
- New and Unusual Technologies
- All items and enclosures under Geological and Geophysical Information
- Mineral Resource Conservation Information

B. BIBLIOGRAPHY

Any previously submitted EP, DPP, or DOCD, study report, survey report; or other material referenced in this DOCD or its accompanying information is listed below:

- Supplemental Development Operations Coordination Document (S-7659) Mississippi Canyon 546 submitted by LLOG Exploration Offshore, LLC and approved 07/03/2014.
- Supplemental Development Operations Coordination Document (S-7708) Mississippi Canyon 546 submitted by LLOG Exploration Offshore, LLC and approved 02/02/2015.
- LLOG Exploration Offshore LLC's approved Regional Oil Spill Response Plan.
- Berger Geosciences, LLC Shallow Hazards Assessment, Benthic Communities Evaluation, and Archaeological Resource Survey prepared for MC 546 dated August 15, 2014 submitted to Minerals Management Service (BOEMRE) under separate cover on September 18, 2014.
- Tesla Offshore, L. L. C. for MC 546 Archaeological Assessment for "G3" surface location (same as "G4" manifold location for this plan) prepared on behalf of LLOG Exploration Offshore, Inc. The report was submitted to BOEM as part of the the Supplemental DOCD (S-7708) and was submitted as part of that plan and is included in this plan.