UNITED STATES GOVERNMENT
MEMORANDUM

November 16, 2018

To: Public Information (MS 5030)
From: Plan Coordinator, FO, Plans Section (MS 5231)

Subject: Public Information copy of plan

Control #	-	S-07910
Type	-	Supplemental Development Operations Coordinations Document
Lease(s)	-	OCS-G19966 Block - 562 Mississippi Canyon Area
Operator	-	BP Exploration & Production Inc.
Description	-	Subsea Well No. 002
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.

Chiquita Hill
Plan Coordinator

Site Type/Name	Botm Lse/Area/Blk	Surface Location	Surf Lse/Area/Blk
WELL/002	G19966/MC/562	3419 FNL, 5306 FEL	G19966/MC/562

Global Projects Organization

Na Kika Isabela 2 Project

Supplemental Development Operations Coordination Document (SDOCD)

Public Information Copy

Adalberto Garcia
BP Exploration and Production Inc.
501 Westlake Park Blvd., WL1 19.112D
Houston, TX 77079
281-995-2815
Adalberto.Garcia@bp.com

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1 Plan Contents

1.1 Description of Activities

BP will drill and complete the OCS-G 19966 Lease, Mississippi Canyon Block 562 Well 002 under the Revised Exploration Plan (R-6704) filed with the BOEM on April 20, 2018 and approved on June 21, 2018. The Seadrill West Capricorn will drill the MC562 002 well and perform completion operations.

This supplemental Development Operations Coordination Document (DOCD) provides for the following operations:

- The Isabela 2 project consists of a single well subsea tie-back to the existing subsea facilities at the Galapagos (LSPS) Oil Loop, more specifically to the spare hub on IS PLEM 2. The Isabela 2 well will be drilled near Isabela 1, just outside of the Galapagos Oil Loop. The primary Isabela 2 top hole location is about 90 ft southeast of the existing IS PLEM 2. The Isabela 2 tree will be tied back to the existing IS PLEM 2 via a new rigid jumper. Power, hydraulics, and chemicals will be delivered from the existing Isabela infield umbilical to the Isabela 2 tree. Services will be taken from the existing far end UTA of the Isabela infield umbilical and re-routed appropriately via flying leads. A new subsea metering skid (SMS) will tie into the existing Isabela UTA via flying leads to route chemicals (AI, SI, CI) to the Isabela 2 tree.
- Commence production from the Mississippi Canyon Block 562 Well 002

Included in **Appendix A** is Form BOEM 137 "OCS Plan Information Form" which provides for the installation of the jumper and SMS and commencement of production from the associated well.

1.2 History of Leases

BP acquired lease OCS-G 19966 in Mississippi Canyon (MC) Area Block 562 in 1997. The lease has royalty relief and is held by production from the MC562-1 well (I-1). Record title is held 66.67% BP and 33.33% Fieldwood. This lease is currently not held by production.

An initial Exploration Plan (EP) N-8778 for Mississippi Canyon Block 562 was submitted by BP Exploration & Production Inc. and approved in August 18, 2006 to drill and temporarily abandon four (4) exploratory wells.

An initial Development Operations Coordination Document (DOCD) N-9461 for Mississippi Canyon Block 562 was submitted by BP Exploration & Production Inc. and approved on March 26, 2010 to tie-back and produce MC562 001.

A revised Exploration Plan (REP) R-6704 for Mississippi Canyon Block 562 was submitted by BP Exploration & Production Inc. and approved in June 21, 2018 to drill and complete MC562 002.

An Environmental Assessment was completed and approved in April 2018 as part of the revised Exploration Plan Control No. R-6704.

The current lease operator and ownership are as follows:

Area / Block Lease No.	Operator	Ownership
Mississippi Canyon 562	BP Exploration & Production Inc.	BP Exploration & Production Inc. – 66.67% Fieldwood – 33.33%

1.3 Location Information

The MC562 002 well is located in MC Block 562 (Lease OCS-G 19966) in a water depth of approximately 6,436 feet, approximately 90 ft southeast of the existing IS PLEM 2.

The Isabela Field (MC-562) is located in approximately 6,500-ft of water. The Isabela field was developed via subsea tie-back to the centrally-located Na Kika "host" facility (MC-474).

Vicinity, Location and Bathymetry Plats are included in **Appendix B**.

Since BP proposes to use a dynamically positioned construction vessel there will be no anchors associated with this activity.

1.4 Safety and Pollution Prevention Features

No additional drilling operations will be conducted under this supplemental Development Operations Coordination Document.

Appropriate fire drills and abandon ship drills will be conducted, and navigational aids, lifesaving equipment, and all other shipboard safety equipment will be installed and maintained as mandated by the U.S. Coast Guard regulations contained in 33 CFR Part 144.

1.5 Storage Tanks and Production Vessels

Information regarding the storage tanks that will be used to conduct the operations proposed in this plan that will store oil, as defined in 30 CFR § 254.6, is provided in the table below. Only those tanks with a capacity of 25 barrels or more are included.

Storage Tanks Construction Vessel

Type of Storage Tank	Type of Facility	Tank Capacity (bbls)	Number of Tanks	Total Capacity (bbls)	Fluid Gravity (API)
Fuel Oil	DP Construction Vessel	16,800	1	16,800	35

1.6 Pollution Prevention Measures

These operations do not propose activities for which the State of Florida is an affected state.

1.7 Additional Measures

Not conducting proposed activities that require reporting additional measures as per NTL 2008-04.

2 General Information

2.1 Applications and Permits

The table below provides information on the filing or approval status of the individual and/or site-specific Federal, State and local application approvals or permits that must be obtained to conduct the proposed activities.

Application/Permit	Issuing Agency	Status
Supplemental Deepwater Operations Plan (SDWOP)	BSEE	Submitted
Lease-Term Pipeline Application	BSEE	Submitted
Revised Conservation Information Document (CID)	BOEM	Pending Submission
Surface Commingling and Production Measurement (SCPM) Revision	BSEE	Pending Submission
Application for Permit to Modify (APM)	BSEE	Pending Submission
NPDES Permit GMG-290110	EPA	Existing

2.2 Drilling Fluids

There are no drilling operations proposed in this supplemental DOCD.

2.3 Anticipated Production

Type	Average Production Rate	Peak Production Rate	Life of Reservoir
PROPRIETARY DATA			

2.4 Oil Characteristics

Not conducting proposed activities that require reporting additional measures as per NTL 2008-04.

2.5 New or Unusual Technology

No new or unusual technology is proposed in this supplemental DOCD as defined by 30 CFR 550.200.

2.6 Bonding Information

The bonding requirements for the activities proposed in this supplemental DOCD are satisfied by an area-wide bond, furnished and maintained according to 30 CFR 556, Subpart I, and NTL No. 2015-N04, and to the extent under 30 CFR 556.901 and National NTL No.2016-N01.

2.7 Oil Spill Financial Responsibility (OSFR)

BP Exploration and Production Inc. (Operator No. 02481) has demonstrated oil spill financial responsibility for the facilities proposed in this supplemental DOCD according to 30 CFR 553, and NTL 2008-N05, "Guidelines for Oil Spill Financial Responsibility for Covered Facilities."

2.8 Deepwater Well Control

BP Exploration and Production Inc. (Operator No. 02481) has the financial capability to drill a relief well and conduct other emergency well control operations. According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations.

2.9 Suspensions of Production

Well MC562 002 in Mississippi Canyon Area Block 562 is planned to be brought to production within a year of completing drilling operations, therefore, BP does not anticipate filing any requests for Suspension of Production to hold the lease at this time.

2.10 Blowout Scenario

BP will drill and complete the OCS-G 19966 Lease, Mississippi Canyon Block 562 Well 002 to the objective sand as outlined in the Geological and Geophysical Information Section under the Revised Exploration Plan (R-6704). The well will utilize a typical structural, conductor, surface and production casing program. In the event of a worst-case discharge scenario from a production standpoint, BP anticipates a peak production rate of 22 MBOPD and 17 MMSCFD with an anticipated API gravity of 30.5°.

All proposed activities and facilities in this DOCD will be covered by the GoM Regional OSRP filed by BP America Inc. (Operator No. 21372) on April 9, 2018, on behalf of several companies listed in the plan including BP Exploration & Production Inc. (Operator No. 02481) and approved by BSEE on May 17, 2018..

3 Geological and Geophysical Information

3.1 Geological Description

The geological description was submitted with the Revised Exploration Plan Control No. R-06704 for drilling and completion of subsea well MC562 002 approved by BOEM on June 21, 2018.

3.2 Structure Contour Maps

Structure Contour Maps were submitted with the Revised Exploration Plan Control No. R-06704 for drilling and completion of subsea well MC562 002 approved by BOEM on June 21, 2018.

3.3 Interpreted 2-D and / or 3D Seismic Lines

Interpreted Seismic lines were submitted with the Revised Exploration Plan Control No. R-06704 for drilling and completion of subsea well MC562 002 approved by BOEM on June 21, 2018.

3.4 Geological Structure Cross-Section Maps

Geological structure cross sections were submitted with the Revised Exploration Plan Control No. R-06704 for drilling and completion of subsea well MC562 002 approved by BOEM on June 21, 2018.

3.5 Shallow Hazards Report

A regional shallow hazards report dated March 2005, previously submitted to BOEM and assigned BOEM Survey No. 6364 was referenced in the Revised Exploration Plan Control No. R-06704 approved by BOEM on June 21, 2018.

3.6 Shallow Hazards Assessment

A shallow hazards assessment (site clearance letter) was previously submitted to BOEM for the well surface location in MC 562, evaluating seafloor and subsurface geologic and manmade features and conditions and was submitted with the Revised Exploration Plan Control No. R-06704 approved by BOEM on June 21, 2018.

Well jumper will be permitted under separate cover and permitted as lease term pipeline application. The application contains an individual hazard assessment.

3.7 High Resolution Seismic Lines

High resolution seismic lines were submitted with the shallow hazards report referenced above and submitted with the Revised Exploration Plan Control No. R-06704 approved by BOEM on June 21, 2018.

4 Hydrogen Sulfide (H_2S) Information

4.1 Concentration

BP does not anticipate encountering H_2S while conducting the proposed operations under this plan.

4.2 Classification

In accordance with Title 30 CFR 250.490(c) the Bureau of Ocean Energy Management (BOEM) has classified the area in which the proposed operations are to be conducted in Mississippi Canyon Block 562 to be "H_2S absent" by approval letter dated June 21, 2018, for the Revised Exploration Plan (Control No. R-06704).

4.3 H2S Contingency Plan

According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations due to "H2S absent" classification by approval letter dated June 21, 2018, for the Revised Exploration Plan (Control No. R-06704).

4.4 Modeling Report

According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations due to "H2S absent" classification by approval letter dated June 21, 2018, for the Revised Exploration Plan (Control No. R-06704).

5 Mineral Resource Conservation Information

5.1 Technology and Reservoir Engineering Practices and Procedures

Enhanced recovery techniques, such as water flooding or Enhanced Oil Recovery, will not be employed in the Isabela Field development due to limitations of the subsea development. Flowline gas lift is currently operational on the Isabela side of the Nakika Galapagos Oil Loop system.

The MC562 002 well is planned to be commingled with the other Isabela and Galapagos wells in the Galapagos Oil Loop system. MC562 002 will be operated in a similar manner as the other Isabela well with down-hole pressure gauges continuously recording pressure and temperature, fluid samples as required for optimization, and rate and pressure build-up tests performed routinely.

5.2 Technology and Recovery Practices and Procedures

The main recovery mechanism is expected to be aquifer drive combined with rock compaction.

5.3 Reservoir Development

Reservoir development is included in the Proprietary Information copies of this supplemental DOCD.

6 Biological, Physical, and Socioeconomic Information

6.1 Benthic Communities Report

The BOEM requires site-specific surveys and reviews for proposed bottom-disturbing actions in water depths greater than 300-m in order to judge the potential of the region for supporting high density chemosynthetic organisms. NTL No. 2009–G40, formalized the process. BP has conformed to this requirement and has located wells to avoid potential sites for benthic communities during the deepwater development project described by this plan.

MC 562 is located in water depths greater than 300-m; therefore, there is the potential for chemosynthetic organisms to be present. Shallow hazards assessments conducted for the project confirm that high density benthic communities are not found within the vicinity of the proposed wellbore and were submitted with the Revised Exploration Plan Control No. R-06704 approved by BOEM on June 21, 2018.

6.2 Biologically Sensitive Underwater Features and Areas

The proposed activities will be conducted in water depths of approximately 6,436-ft. Therefore, requirements of NTL 2009-G39 for biologically sensitive underwater features and areas such as Topographic Features, Live Bottom (low-relief), Live Bottom (Pinnacle Trend) features, and other potentially sensitive biological features when conducting OCS operations in water depths less than 300-m (984-ft) in the Gulf of Mexico do not apply to this plan.

All proposed bottom-disturbing activities in this DOCD will occur outside of the nearest Topographic Features, "No Activity Zones", Live Bottom (low Relief), and Live Bottom (Pinnacle Trend) Stipulation Blocks described in NTL 2009-G39 and shown on BOEM December 2012 Map: "Biologically Sensitive Areas (< 300-m)".

6.3 Remotely Operated Vehicle (ROV) Monitoring Survey Plan

No longer applicable. NTL 2008-G06 "Remotely Operated Vehicle Surveys in Deepwater" has expired.

6.4 Threatened or Endangered Species, Critical Habitat and Marine Mammal Information

All marine mammals are protected under the Marine Mammal Protection Act (MMPA) and some are also protected under the Endangered Species Act (ESA).

One cetacean, the sperm whale and one sirenian species listed under the Endangered Species Act (ESA), occur in the GoM (USDOI, BOEMRE Final S-EIS CPA 2012-058). The only endangered marine mammal likely to be present at or near the project area is the sperm whale (Physeter macrocephalus); the threatened West Indian Manatee (Trichechus manatus) is thought to be remotely located away from the project area. The oceanic whitetip shark (Carcharhinus longimanus) was listed as threatened under the ESA on 30 January 2018 (effective 30 March 2018) by NMFS (83 FR 4153) and may be found in the Gulf of Mexico.

According to the project specific EIA, excluding the three endangered/threatened species mentioned above, there are an additional 21 species of marine mammals that may be found in the Gulf of Mexico. This includes 1 species of mysticete whale, dwarf and pygmy sperm whales, 4 species of beaked whales, and 14 species of delphinid whales (dolphins). The most common non-endangered cetaceans in the deepwater environment are small odontocetes such as the pantropical spotted dolphin, spinner dolphin, and bottlenose dolphin.

Endangered or threatened species that may occur in the project area and/or along the northern Gulf Coast are listed below and taken from Table 7 of Appendix D.

Federally listed endangered and threatened species potentially occurring in the lease area and along the northern Gulf Coast.

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in Gulf of Mexico
			Project area	Coastal	
Marine Mammals					
Bryde's whale	*Balaenoptera edeni*[a]	P	X	--	None
Sperm whale	*Physeter macrocephalus*	E	X	--	None
West Indian manatee	*Trichechus manatus*[b]	T	--	X	Florida (Peninsular)
Sea Turtles					
Loggerhead turtle	*Caretta caretta*	T,E[c]	X	X	Nesting beaches and nearshore reproductive habitat in Mississippi, Alabama, and Florida; Sargassum habitat including most of the central & western Gulf of Mexico.
Green turtle	*Chelonia mydas*	T	X	X	None
Leatherback turtle	*Dermochelys coriacea*	E	X	X	None
Hawksbill turtle	*Eretmochelys imbricata*	E	X	X	None
Kemp's ridley turtle	*Lepidochelys kempii*	E	X	X	None
Birds					
Piping Plover	*Charadrius melodus*	T	--	X	Coastal Texas, Louisiana, Mississippi, Alabama, and Florida
Whooping Crane	*Grus americana*	E	--	X	Coastal Texas (Aransas National Wildlife Refuge)
Fishes and Sharks					
Oceanic whitetip shark	*Carcharhinus longimanus*	T	X	--	None
Gulf Sturgeon	*Acipenser oxyrinchus desotoi*	T	--	X	Coastal Louisiana, Mississippi, Alabama, and Florida
Invertebrates					
Elkhorn coral	*Acropora palmata*	T	--	X	Florida Keys and the Dry Tortugas
Lobed star coral	*Orbicella annularis*	T	--	X	None
Mountainous star coral	*Orbicella faveolata*	T	--	X	None
Boulder star coral	*Orbicella franksi*	T	--	X	None
Terrestrial Mammals					
Beach mice (Alabama, Choctawhatchee, Perdido Key, St. Andrew)	*Peromyscus polionotus*	E	--	X	Alabama and Florida (Panhandle) beaches

Source: Project Specific EIA prepared by CSA Ocean Sciences Inc. July 2018

E = endangered; P = Proposed; T = threatened; X = potentially present; -- = not present.

[a] Gulf of Mexico Bryde's whales are protected by the Marine Mammal Protection Act. There is currently a proposed rule to list this stock as 'endangered' under the Endangered Species Act.

[b] There are two subspecies of West Indian manatee: the Florida manatee (*T. m. latirostris*), which ranges from the northern Gulf of Mexico to Virginia, and the Antillean manatee (*T. m. manatus*), which ranges from northern Mexico to eastern Brazil. Only the Florida manatee subspecies is likely to be found in the northern Gulf of Mexico. On 30 March 2-17, the USFWS announced the West Indian manatee, including the Florida manatee subspecies, was reclassified as threatened.

[c] The loggerhead turtle is composed of nine distinct population segments (DPS). The only DPS that may occur in the project area (Northwest Atlantic DPS) is listed as threatened (76 *Federal Register* [FR] 58868; 22 September 2011).

Five species of sea turtle are known to inhabit the waters of the Gulf of Mexico:

- leatherback sea turtle (*Dermochelys coriacea*)
- green sea turtle (*Chelonia mydas*)
- hawksbill sea turtle (*Eretmochelys imbricata*)
- Kemp's ridley sea turtle (*Lepidochelys kempii*)
- loggerhead sea turtle (*Caretta caretta*)

According to the project specific EIA (Appendix I), Five species of endangered or threatened sea turtles may be found near the lease area. Endangered species include the leatherback (*Dermochelys coriacea*), Kemp's ridley (*Lepidochelys kempii*), and hawksbill (*Eretmochelys imbricata*) turtles. As of 6 May 2016, the entire North Atlantic DPS of the green turtle (*Chelonia mydas*) is listed as threatened (81 FR 20057). The DPS of loggerhead turtles (*Caretta caretta*) that occurs in the Gulf of Mexico is listed as threatened, although other DPSs are endangered.

Mississippi Canyon Block 562 falls outside Sargassum critical habitat designated for the loggerhead sea turtle. Additional information can be found in the Environmental Impact Analysis attached as **Appendix D.**

Two species of fish are the only listed threatened and endangered fish species in the Gulf of Mexico.

- Smalltooth Sawfish (*Pristis pectinata*)
- Gulf Sturgeon (subspecies *Acipenser oxyrinchus desotoi*)

The NMFS and United States Fish and Wildlife Service (USFWS) designated critical habitat for the Gulf sturgeon in fourteen geographic areas from Florida to Louisiana, encompassing spawning rivers and adjacent estuarine areas.

The smalltooth sawfish (*Pristis pectinata*) is remote from the project area and highly unlikely to be affected.

Two coastal species of birds that inhabit the GoM are protected under the ESA:

- Piping Plover (Charadrius melodus)
- Whooping Crane (*Grus americana*)

Critical overwintering habitat for the Piping plover has been designated in GoM, including beaches in Texas, Louisiana, Mississippi, Alabama, and Florida. Whooping crane critical habitat has been designated within the GoM region within the Aransas National Wildlife Refuge in Texas.

Four beach mice species occurring in the GoM are listed as endangered under the ESA and occupy restricted habitats in the mature coastal dunes of Florida and Alabama:

- Alabama beach mouse (*Peromyscus polionotus ammobates*)
- Choctawhatchee beach mouse (*Peromyscus polionotus allophrys*)
- St. Andrew beach mouse (*Peromyscus polionotus peninsularis*)
- Perdido Key Beach mouse (*Peromyscus polionotus trissyllepsis*)

The Florida salt marsh vole (*Microtus pennsylvanicus dukecampbelli*) is remote from the project area and highly unlikely to be affected.

There are currently six species of corals listed as threatened under the ESA in the Gulf of Mexico:

- elkhorn coral (*Acropora palmata*)
- staghorn coral (*Acropora cervicornis*)
- lobed star coral (*Orbicella annularis)*
- mountainous star coral (*Orbicella faveolata)*
- boulder star coral (*Orbicella franksi)*

The nearest critical habitat is for the elkorn coral has been designated in the Florida Keys.

According to the project specific EIA: "There are no other endangered animals or plants in the Gulf of Mexico that are reasonably likely to be adversely affected by either routine or accidental events."

6.5 Archaeological Report

Mississippi Canyon Area Block 562 is located within the areas of high archaeological potential, as described in NTL 2011-JOINT-G01. The following Archaeological surveys and assessments have been performed covering the majority of MC562 and the proposed well location as referenced under Section 3.5.

C&C Technologies Survey Services, Inc. (C&C), 2006, "Archaeological and Hazard Study, Isabela Prospect, Block 562 (OCS-G-19966) and Vicinity, Mississippi Canyon Area, Project No. 8851-061235, issued to BP America Inc., June 2006.

C&C Technologies Survey Services, Inc. (C&C), 2009, "Archaeological, Engineering and Hazard Study, Galapagos Development Survey, Proposed Isabela, Santiago, Santa Cruz Infield Flowline Routes, Block 562 (OCS-G-19966) to Block 474 (OCS-G-26259), Mississippi Canyon Area, Project No. 097364-097423, issued to BP America Inc., November 2009.

7 Waste and Discharge Information

7.1 Projected Generated Wastes

A table providing information on the projected solid and liquid wastes likely to be generated by the proposed activities is included in **Appendix C**.

7.2 Projected Ocean Discharges

A table providing information on the projected ocean discharges likely to be generated during the proposed activities is included in **Appendix C.**

8 Air Emissions Information

8.1 Emissions Screening Questions

Yes	No	Screening Questions for DOCD's
	X	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 = 3400D2/3 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 H2S 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?

8.2 Air Emissions Summary

The BOEM 0139 Form was used to quantify the Plan emissions for the installation of one (1) jumper for the Isabela 2 project in 2018. The Plan emissions are the same as the Complex Total Emissions for the project. The Air Quality emissions summary below indicates that the NOx emissions proposed for the project are lower than the emission exemption threshold specified in the Bureau of Ocean Energy Management (BOEM) regulations in 30 CFR 550.303(d). As a result, no further Air Quality Review is required for this project.

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL
BP Exploration	Mississippi Canyon	562	OCS-G 19966	0	002

Year	Emitted Substance				
	PM	SOx	NOx	VOC	CO
2019	11.95	5.90	360.89	12.54	78.68
Allowable	2144.52	2144.52	2144.52	2144.52	54626.43

8.2.1 Emission Reductions Measures

There are no emission reductions measures proposed for this project.

8.2.2 Verification of Non-Default Emission Factors

BP utilized the default emission factors in the BOEM Form 0139 to calculate emissions for this project. There are no non-default emission factors proposed for this project.

9 Oil Spill Information

9.1 Oil Spill Response Planning

9.1.1 Regional OSRP Information

All proposed activities and facilities in this supplemental DOCD will be covered by the GoM Regional OSRP filed by BP America Inc. (Operator No. 21372) on April 9, 2018, on behalf of several companies listed in the plan including BP Exploration & Production Inc. (Operator No. 02481) and approved by BSEE on May 17, 2018.

BP has adopted additional performance standards:

a. Provisions to maintain access to a supply of dispersant and fire boom for use in the event of an uncontrolled long-term blowout for the length of time required to drill a relief well;

b. Contingencies for maintaining an ongoing response for the length of time required to drill a relief well;

c. Description of measures and equipment necessary to maximize the effectiveness and efficiency of the response equipment used to recover the discharge on the water's surface, including methods to increase encounter rates;

d. Information regarding remote sensing technology and equipment to be used to track oil slicks, including oil spill detection systems and remote thickness detection systems (e.g., X-band/infrared systems);

e. Information regarding the use of communication systems between response vessels and spotter personnel;

f. Shoreline protection strategy that is consistent with applicable area contingency plans; and

g. For operations using a subsea BOP or a surface BOP on a floating facility, a discussion regarding strategies and plans related to source abatement and control for blowouts from drilling.

9.1.2 Spill Response Site

Primary Response Equipment Location	Preplanned Staging Location(s)
Pensacola, FL; Tampa, FL; Mobile, AL; Pascagoula, MS; Houma, LA.; Leeville, LA; Morgan City, LA; Lake Charles, LA.; Fort Jackson, LA; Venice, LA; Galveston, TX; Corpus Christi, TX; Ingleside, TX.	Fourchon, LA.

9.1.3 OSRO Information

BP is a member of the Marine Spill Response Corporation (MSRC), Clean Gulf Associates (CGA) and the National Response Corporation and would utilize said Oil Spill Response Organization (OSRO) personnel and equipment in the event of an oil spill at Mississippi Canyon Area Block 562.

9.1.4 Worst-Case Scenario Determination

Category	Regional OSRP approved 5/17/2018 Production	Supplemental DOCD Production
Type of Activity	Production > 10 miles	Production > 10 miles
Facility Location	MC 822	MC 562
Facility Designation	Thunder Horse Well – MC 822-11	SS Well MC562 002
Distance to Nearest Shoreline	68-miles	64.4-miles
Volume Facility Storage:	0-bbls	0-bbls
Max Tanks /Vessels	0-bbls	16,800-bbls
Flowlines	0-bbls	0-bbls
Lease Term pipelines	63,000-bbls	3-bbls
Daily Production Volume	55,000-bbls	19,000-bbls
Volume Uncontrolled Blowout (Day 1)	0-bbls	0-bbls
Total Volume	118,000-bbls	35,803-bbls
Type of Oil(s) – (Crude Oil, Condensate, Diesel)	Crude	Crude
API Gravity(s)	33.0	30.5

The activities proposed in this supplemental DOCD include the installation of a lease term pipeline (well jumper) utilizing a dynamically positioned construction vessel.

BP has determined that the worst case scenario from the activities proposed in this plan does not supersede the worst case scenario in BP's Regional OSRP approved on May 17, 2018. Therefore, pursuant to NTL No. 2008-G04, BP makes the following statement:

Since BP Exploration & Production Inc. has the capability to respond to the worst-case spill scenario included in its Regional Oil Spill Response Plan approved on May17, 2018 , and since the worst-case scenario determined for this DOCD does not replace the appropriate worst-case scenario in our regional OSRP, BP hereby certifies that it 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 this DOCD.

9.2 Oil Spill Response Discussion

Not conducting proposed activities that require reporting Oil Spill Response Discussion as per NTL 2008-04.

10 Environmental Monitoring and Mitigation Measures

10.1 Monitoring Systems

Operational personnel have been instructed to check for pollution frequently during their tour of duty and, in the event pollution is spotted, to identify and shut-off the source and make immediate notifications as per instructions provided in Section 8 of BP's certified OSRP.

10.2 Incidental Takes

To mitigate against incidental takes, activities will be conducted in adherence to BSEE NTL 2015-G03 "Marine Trash and Debris Awareness Training and Elimination", NTL 2016-G02 "Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program" and and BOEM NTL 2016-G01 "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting". As required by BSEE NTL 2015-G03, BP submits an annual certification letter for its Marine Debris Awareness Training Process. The marine debris awareness training is required annually by the BSEE and is identified by "BP's Gulf of Mexico (GoM) Environmental Training Matrix" and "BP's GoM Health, Safety, and Environmental (HSE) Training Needs Assessment", both of which are located on BP's GoM HSE website. Monitoring activities are conducted by personnel on vessels to prevent accidental loss of materials overboard, and to report sightings of injured/ dead protected species. Reporting of dead/ injured protected species is addressed in Annex 2 of BP's "Incident Notification and Investigation Procedure - Attachment 1".

10.3 Flower Garden Banks National Marine Sanctuary

All proposed activities will occur outside of the Protective Zones of the Flower Garden Banks and Stetson Bank.

11 Lease Stipulations

Oil and gas exploration activities on the OCS are sometimes subject to mitigations in the form of lease stipulations.

11.1 Lease Stipulation Information

Lease Stipulation for Protected Species

All activities will be conducted in adherence to NTL 2015-G03 "Marine Trash and Debris Awareness Training and Elimination"; BOEM NTL 2016-G01 "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting" and BOEM NTL 2016-G02 "Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program". Mitigation to prevent takes varies based on the activity underway and it can include worker training on waste management and trash and debris containment procedures to avoid accidental loss overboard and its potential impact on protected species, and training on reporting of dead/injured protected species addressed in BP's Incident Notification and Investigation Procedure.

12 Related Facilities and Operations Information

12.1 Related OCS Facilities and Operations

The Isabela 2 project consists of a single well subsea tie-back to the existing subsea facilities at the Galapagos (LSPS) Oil Loop, more specifically to the spare hub on IS PLEM 2. The Isabela 2 well will be drilled near Isabela 1, just outside of the Galapagos Oil Loop. The primary Isabela 2 top hole location is about 90 ft southeast of the existing IS PLEM 2. The Isabela 2 tree will be tied back to the existing IS PLEM 2 via a new rigid jumper. Power, hydraulics, and chemicals will be delivered from the existing Isabela infield umbilical to the Isabela 2 tree. Services will be taken from the existing far end UTA of the Isabela infield umbilical and re-routed appropriately via flying leads. A new subsea metering skid (SMS) will tie into the existing Isabela UTA via flying leads to route chemicals (AI, SI, CI) to the Isabela 2 tree.

Production from well MC562 002 will commingle with the other Isabela and Galapagos wells in the Galapagos Oil Loop system and will terminate at BP's existing Mississippi Canyon Area Block 474 A (Na Kika) FDPS, RUE OCS-G 23624. These incoming produced hydrocarbons will be separated and measured with the existing production processed at Na Kika.

The anticipated combined flow rates and shut-in times for the proposed pipeline are as follows:

Origination Point	Flow Rates	Shut-in Time
Galapagos Oil Loop (Well MC562 002)	**PRPOPRIETARY DATA**	**< 2 Minutes**

12.2 Transportation System

The Na Kika production will be transported by the existing export pipeline system.

Gas production from subsea wells produced to the Na Kika facility will continue to be measured for sales and royalty purposes on the Na Kika Mississippi Canyon Block 474 A Platform, a semisubmersible FDPS, prior to delivery to shore via Operations System DTN.

Liquid hydrocarbons from subsea wells produced to the Na Kika facility will continue to be measured for sales and royalty purposes using a LACT unit located on this same facility prior to delivery to shore via Operations System No. 51.1.

12.3 Produced Liquid Hydrocarbon Transportation Vessels

According to NTL 2008-G04, this Section of the Plan is not applicable to the proposed operations.

13 Support Vessels and Aircraft Information

13.1 General

Type	Maximum Fuel Tank Storage Capacity	Maximum No. in Area at Any Time	Trip Frequency or Duration
Helicopter	760-gals	2	2 / week
Supply Boats	5,000-bbls	1	2 / week

13.2 Diesel Oil Supply Vessels

Not conducting proposed activities that require reporting Oil Spill Response Discussion as per NTL 2008-04.

13.3 Drilling Fluids Transportation

There are no drilling operations proposed in this supplemental DOCD.

13.4 Solid and Liquid Wastes Transportation

Information about the transportation of solid and liquid wastes generated by proposed activities has been included in **Appendix C**.

13.5 Vicinity Map

A vicinity map depicting the location of the proposed activities relative to the shoreline, the distance of the proposed activities from the shoreline, and the primary route(s) of the support vessels and aircraft when traveling between the onshore support facilities and the project areas is included in **Appendix B.**

14 Onshore Support Facilities Information

14.1 General

The onshore support base for the proposed operations will be in Fourchon, Louisiana. Mississippi Canyon Block 562 is located approximately 108.6 miles from the existing onshore support base located in Fourchon, Louisiana, as indicated on the vicinity map in **Appendix B.**

The following table provides information of the existing onshore facility that will be used to provide supply and service support for the activities proposed in this plan.

Name	Location	Existing / New / Modified
C-Port	Fourchon, LA	Existing
Heliport	Houma, LA	Existing

BP will primarily use the existing C-Port Fourchon Shorebase located in Fourchon, Terrebonne Parish, Louisiana to support general vessel operations. No expansion of these physical facilities is expected to result from the proposed revised activities. The C-Port Fourchon facility is located approximately 143-miles from the general activity area, provides a vehicle parking lot, office space, radio communication equipment, outside and warehouse storage space, crane, forklifts, water and fueling facilities, and boat dock space. The base is in operation 24-hours each day. Helicopters will be based out of Houma, Louisiana.

A small amount of vessel and helicopter traffic may originate from bases other than those described above in order to address changes in weather conditions. It is expected that this vessel traffic will originate from bases and locations that are in the near vicinity of the bases previously described.

14.2 Support Base Construction or Expansion

Not conducting proposed activities that require reporting Oil Spill Response Discussion as per NTL 2008-04.

14.3 Waste Disposal

Information about the onshore facilities used to store and dispose of solid and liquid wastes generated by proposed activities has been included in **Appendix C**.

15 Coastal Zone Management Act (CZMA) Information

15.1 Consistency Certification

A Coastal Zone Management Act consistency certification, according to 15 CFR Part 930.76(b) and (c) for the State of Louisiana and Alabama are included as **Appendix F**.

16 Environmental Impact Analysis (EIA)

Attached as **Appendix D** is an Environmental Impact Analysis (EIA) prepared for the proposed project by CSA Ocean Sciences Inc., 8502 SW Kansas Avenue, Stuart, Florida 34997.

BOEM (or its predecessor, the Minerals Management Service) has conducted extensive environmental analyses examining the possible impacts produced by oil and gas exploration and production activities, which evaluated impacts from similar activities on the areas in the Gulf of Mexico covered by the present plan.

The EIA, in addressing the project-specific environmental impacts of the present plan, contains conclusions and supporting analyses that are consistent with the extensive prior environmental analyses discussed above.

17 Administrative Information

17.1 Exempted Information Description

In accordance with 43 CFR Part 2, Appendix E, sections (4) and (9), the following information has been determined by the BOEM GOMR exempt from public disclosure:

- Production rates and life of reservoirs
- Proprietary New or Unusual Technology

This information is excluded from the "Public Information" copies of the submitted plan.

17.2 Bibliography

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

Plan Control No	Lease	Blk	Operator Name	Operator Number	Plan Type Code	Received Date	Final Action Code	Final Action Date
R-6704	G19966	MC 562	BP Exploration & Production Inc	02481	EP	04/20/2018	C	06/21/2018
R-5061	G19966	MC 562	BP Exploration & Production Inc	02481	DOCD	8/18/2010	X	10/17/2011
N-9461	G19966	MC 562	BP Exploration & Production Inc.	02481	DOCD	11/9/2009	A	3/26/2010
R-4490	G19966	MC 562	BP Exploration & Production Inc.	02481	EP	1/30/2007	A	2/13/2007
N-8778	G19966	MC 562	BP Exploration & Production Inc.	02481	EP	7/6/2006	C	8/18/2006

17.3 Other Reference Items

Bureau of Ocean Energy Management. 2017a. Gulf of Mexico OCS Oil and Gas Lease Sales: 2017-2025. Gulf of Mexico Lease Sales 249, 250, 251, 252, 253, 254, 256, 257, 259, and 261. Final Multisale Environmental Impact Statement. U.S. Department of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico OCS Region. New Orleans, LA. OCS EIS/EA BOEM 2017-009.

Bureau of Ocean Energy Management. 2017b. Gulf of Mexico OCS Oil and Gas Lease Sale. Final Supplemental Environmental Impact Statement 2018. U.S. Department of the Interior, Bureau of Ocean Energy Management, Gulf of Mexico OCS Region. New Orleans, LA. OCS EIS/EA BOEM 2017-074.

Gardline Surveys, Inc., Project No. 6364, March 2005, 3D Geohazard Assessment, Gulf of Mexico – Mississippi Canyon Blocks 338-342, 382-386, 426-431, 470-479, 517-523, 561-567, & 605-608, Na Kika Prospect 3D Geohazard Study

C&C Technologies Survey Services, Inc. (C&C), 2006, "Archaeological and Hazard Study, Isabela Prospect, Block 562 (OCS-G-19966) and Vicinity, Mississippi Canyon Area, Project No. 8851-061235, issued to BP America Inc., June 2006.

C&C Technologies Survey Services, Inc. (C&C), 2009, "Archaeological, Engineering and Hazard Study, Galapagos Development Survey, Proposed Isabela, Santiago, Santa Cruz Infield Flowline Routes, Block 562 (OCS-G-19966) to Block 474 (OCS-G-26259), Mississippi Canyon Area, Project No. 097364-097423, issued to BP America Inc., November 2009.

Environmental Impact Analysis for a Supplemental Development Operations Coordination Document for Mississippi Canyon Block 562, CSA Ocean Sciences Inc. August 2018.

17.4 Service Processing Fee

A receipt in the amount of $4,238.00 for the service processing fee as required by 30 CFR § 550.125 is included in **Appendix G**.

Appendixes

Appendix A: OCS Plan Information Forms – Form BOEM-0137

Appendix B: Vicinity, Location and Bathymetry Plats

Appendix C: Waste and Discharge Information

Appendix D: Environmental Impact Assessment

Appendix E: Air Emissions Information – Form BOEM-0139

Appendix F: Coastal Zone Management Certifications (LA & AL)

Appendix G: Service Processing Fee

Appendix A: OCS Plan Information Forms – Form BOEM-0137

OCS PLAN INFORMATION FORM – Public Information Copy

General Information

Type of OCS Plan:		Exploration Plan (EP)	Development Operations Coordination Document (DOCD)	X	
Company Name: BP Exploration & Production Inc.			BOEM Operator Number: 02481		
Address: 501 Westlake Park Blvd			Contact Person: Adalberto Garcia		
Houston, TX 77079			Phone Number: 281-995-2815		
			E-Mail Address: Adalberto.Garcia@bp.com		
If a service fee is required under 30 CFR 550.125(a), provide the	Amount paid	$4,238.00	Receipt No.	75552792623	

Project and Worst Case Discharge (WCD) Information

Lease(s): OCS-G 19966		Area: MC		Block(s): 562		Project Name (If Applicable): Isabela 2			
Objective(s)	X	Oil		Gas		Sulphur		Salt	Onshore Support Base(s): Fourchon, LA
Platform/Well Name: MC562 002		Total Volume of WCD: 26 STBO during shut-in time < 2 mins							API Gravity: 30.5°
Distance to Closest Land (Miles): 64.4 statute miles		Volume from uncontrolled blowout: 35,803 STBO/day							

Have you previously provided information to verify the calculations and assumptions for your WCD?	X	Yes		No
If so, provide the Control Number of the EP or DOCD with which this information was provided	R-6704			
Do you propose to use new or unusual technology to conduct your activities?		Yes	X	No
Do you propose to use a vessel with anchors to install or modify a structure?		Yes	X	No
Do you propose any facility that will serve as a host facility for deepwater subsea development?		Yes	X	No

Description of Proposed Activities and Tentative Schedule (Mark all that apply)

Proposed Activity	Start Date	End Date	No. of Days
Installation of lease term pipelines (jumper)	02/17/2019	03/25/2019	37
Commence Production	03/26/2019		1

Description of Drilling Rig

	Jackup		Drillship
	Gorilla Jackup		Platform rig
	Semisubmersible		Submersible
	DP Semisubmersible		Other (Attach Description)
Drilling Rig Name (If Known):			

Description of Structure

	Caisson		Tension leg platform
	Fixed platform		Compliant tower
	Spar		Guyed tower
	Floating production system		Other (Attach Description)

Description of Lease Term Pipelines

From (Facility/Area/Block)	To (Facility/Area/Block)	Diameter (Inches)	Length (Feet)
Well MC562 002	IS PLEM 2 (MC562)	8.625"	~85'

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):MC562 002					Previously reviewed under an approved EP or DOCD? **N-8778 / R-4490/R-6704**		X	Yes		No
Is this an existing well or structure?		Yes	X	No	If this is an existing well or structure, list the Complex ID or API No.	API No. 608174139001				
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?								Yes	X	No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day):	For structures, volume of all storage and pipelines (Bbls): N/A	API Gravity of fluid	30.5°

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS-G 19966		OCS OCS
Area Name	Mississippi Canyon		
Block No.	562		
Blockline Departures (in feet)	N/S Departure: 3,419.00 FNL	N/S Departure:	N/S Departure: F____L N/S Departure: F____L N/S Departure: F____L
	E/W Departure: 5,306.00 FEL	E/W Departure:	E/W Departure: F____L E/W Departure: F____L E/W Departure: F____L
Lambert X-Y coordinates	X: 1,230,214.00’	X:	X: X: X:
	Y: 10,324,261.00’	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 28° 26’ 37.195” N	Latitude	Latitude Latitude Latitude
	Longitude 88° 16’ 36.540” W	Longitude	Longitude Longitude Longitude

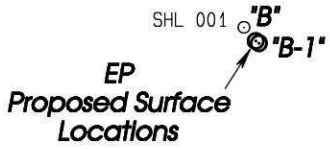
Water Depth (Feet): 6,436	MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:				

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 =	

Appendix B: Vicinity, Location and Bathymetry Plats

10, 327, 680.00ft



MC 562

BP Exploration & Production
OCS-G19966

1, 219, 680.00ft

1, 235, 520.00ft

EP Proposed Surface Hole Locations:

PSHL	MC562 BLOCK TIES FNL	FEL	UTM Zone 16 North NAD27 - US Survey Feet Northing (Y)	Easting (X)	NAD27 Lat/Long Latitude (N)	Longitude (W)	NAD83 Lat/Long Latitude (N)	Longitude (W)	Water Depth MSL (feet)
B	3419.00	5306.00	10324261.00	1230214.00	28°26'37.195"	88°16'36.540"	28°26'38.080"	88°16'36.530"	6436
B-1	3441.00	5273.00	10324239.00	1230247.00	28°26'36.980"	88°16'36.168"	28°26'37.865"	88°16'36.158"	6436

10, 311, 840.00ft

Notes:
1) All spatial ldata based on UTM Zone 16 North, NAD27, US Survey Feet, unless otherwise noted;
2) All geodetic transformations by NADCON 2.0, or better equivalent software;
3) This operation is not within a Military Warning Area;
4) This operation is within BSEE New Orleans District;
5) Water Depths are approximate and are based on GEMS 3D Seismic Derived bathymetry adjusted +13 feet to match as-drilled well depth @ MC562 No.1 of 6435ft.

Grid: UTM Zone 16 North
Datum: NAD27
Units: US Survey Feet

"Public Information"

BP EXPLORATION AND PRODUCTION

PROPOSED EP LOCATIONS OCS-G19966 MC562 "B" and "B-1"

Mississippi Canyon Area (OPD# NH16-10) Block 562 — Federal Offshore

Plat prepared by: Robert M. Frost, PLS, Reservoir Development

Scale 1" = 2000 ft

Date: 13 March 2018

rmf

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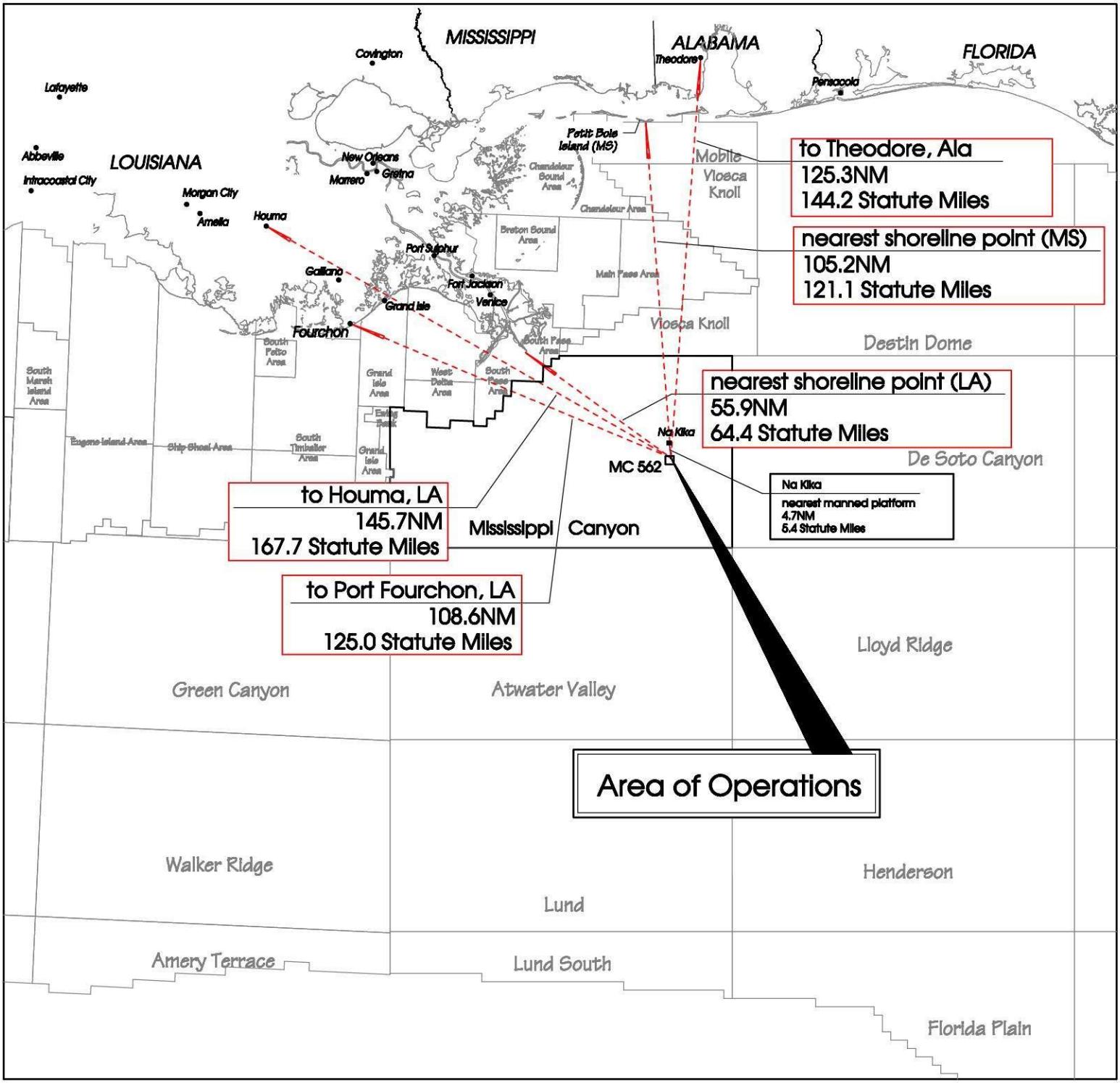


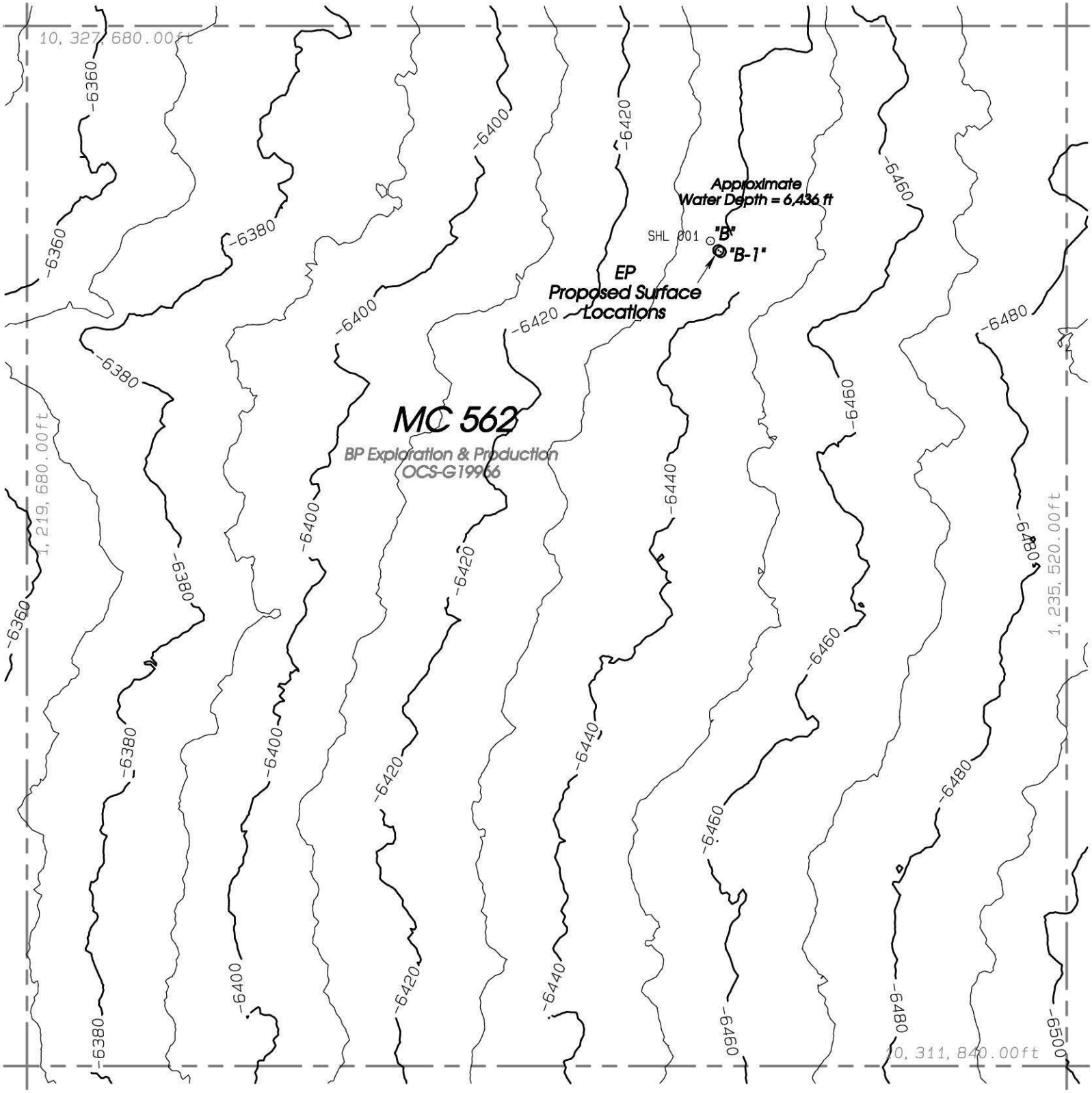
N
Grid North
W
E
S

Grid: UTM Zone 16 North
Datum: NAD27
Units: US Survey Feet

"VICINITY CHART"

bp	BP EXPLORATION AND PRODUCTION Proposed EP Locations OCS-G19966 MC562 "B" and "B-1" *Mississippi Canyon Area (OPD# NH16-10) Block 562* — *Federal Offshore* Plat prepared by: Robert M. Frost, PLS, BP Reservoir Development	*Scale 1" = 50 miles* *Date: 13 March 2018* *rmf*

file: C:\Users\frosr0\OneDrive - BP\DellM4700_Cdrive\bda_drive\BP\1_GoM_Project_Work_files\ocs_g_mc\1_Active_Regulatory_Platting\rmf\MC562_No2_Isabela\MC562_No2_March2018_Vicinity.pro



Notes:
1) All spatial ldata based on UTM Zone 16 North, NAD27, US Survey Feet, unless otherwise noted;
2) All geodetic transformations by NADCON 2.0, or better equivalent software;
3) This operation is not within a Military Warning Area;
4) This operation is within BSEE New Orleans District;
5) Water Depths are approximate and are based on GEMS 3D Seismic Derived bathymetry adjusted +13 feet to match as-drilled well depth @ MC562 No.1 of 6435ft.

Bathymetry:
GEMS 3D Seismic Derived Bathymetry
Adjusted +13 feet to match as-drilled well depth @ MC562 No.1 of 6435ft.
Contour Interval = 10 feet.

Grid: UTM Zone 16 North
Datum: NAD27
Units: US Survey Feet
Grid North

"Bathymetry"

bp

BP EXPLORATION AND PRODUCTION

PROPOSED EP LOCATIONS OCS-G19966 MC562 "B" and "B-1"

Mississippi Canyon Area (OPD# NH16-10) Block 562 — *Federal Offshore*

Plat prepared by: Robert M. Frost, PLS, Reservoir Development

Scale 1" = 2000 ft
Date: 13 March 2018
rmf

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Appendix C: Waste and Discharge Information

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

I2 Tie-Back
37 days total

Type of Waste	Composition	Projected Amount	Projected ocean discharges: Discharge Rate	Discharge Method	Projected Downhole Disposal: Answer yes or no
Will drilling occur ? If yes, you should list muds and cuttings					
Water Based Fluid	Spent drilling fluid drilling riserless hole plus pad mud to fill the hole	0 bbl/well	0 days @ bbl/day	Seafloor	No
Cuttings wetted with Water Based Fluid	Water base interval	0 bbl/well	0 days @ bbl/day	Seafloor	No
Excess Cement Slurry	Excess mixed cement, including additives & waste from equipment wash down after a cement operation	0 bbl/well	0 cmt jobs @ bbl/cmt job	Surface	No
Cuttings wetted with Synthetic Based Fluid	Drill cuttings, cement cuttings, & synthetic base mud retained on cuttings	- bbl/well	0 days @ bbl/day	Surface	No
Small Volume Drilling Fluid Discharges associated with Cuttings	Displaced interfaces, accumulated solids in sand traps, pit clean-out solids, & centrifuge discharges made while changing the mud weight	0 bbl/well	0 days @ bbl/day	Surface	No
Cement transfer losses	Bulk transfer between vessels	0 sks/well	0 events @ sks/event	Surface	No
Barite transfer losses	Bulk transfer between vessels	0 sks/well	0 events @ sks/event	Surface	No
Will humans be there? If yes, expect conventional waste					
Domestic Waste / Gray Water	Food waste, drainage from dishwasher, shower, laundry, bath, & washbasin drains	6,970 bbl	28 9 days @ 175 232 bbl/day (avg)	Surface	No
Sanitary Waste	Treated human body waste discharged from toilets & urinals	2,970 bbl	28 9 days @ 74 99 bbl/day (avg)	Surface	No
Is there a deck? If yes, there will be Deck Drainage					
Deck Drainage	Deck washdown & rain water	3,811 bbl	28 9 days @ 61 140 bbl/day (avg)	Surface	No
Will you conduct well treatment, completion, or workover?					
Well Treatment Fluids	Stimulations fluids including acids, solvents & propping agents	bbl	events @ bbl/event	Surface	No
Completion Fluids	Salt solutions, weighted brines, polymers & various additives	bbl	days @ bbl/day	Surface	No
Workover Fluids - **If applicable**	Salt solutions, weighted brines, polymers, & other speciality additives	bbl	days @ bbl/day	Surface	No
Miscellaneous discharges. If yes, only fill in those associated with your activity.					
Desalinization Unit Discharge	Wastewater associated with the process of creating freshwater from seawater	2,974 bbl	37 days @ 80 bbl/day	Surface	No
Blowout Preventer Fluid	Fluid used to actuate the hydraulic equipment on the BOP			N/A	N/A
Uncontaminated Ballast Water	Uncontaminated seawater added or removed to maintain proper draft	1,258 bbl	37 days @ 34 bbl/day (avg)	Surface	No
Uncontaminated Bilge Water	Water that collects in the vessels bilge	444 bbl	37 days @ 12 bbl/day (avg)	Surface	N/A
Cement discharged at seafloor	Excess mixed cement slurry	bbl	event @ bbl/day	Seafloor	No
Fire Water	Uncontaminated seawater/freshwater used for fire control	49,856 bbl	28 9 days @ 4917 200 bbl/day (avg)	Surface	No
Cooling Water / Utility Water	Uncontaminated seawater	9,565 bbl	37 days @ 235 bbl/day	Surface	No
Sea Water / Fresh Water that has been Chemically Treated	Biocide, corrosion inhibitors, or other chemicals used to prevent corrosion or fouling of piping or equipment	bbl	event @ bbl/event	Surface	No
Sub Sea Fluid Discharges	Wellhead Preservation, Hydrate Control, Umbilical Steel Tube Storage, Leak Tracer, & Riser Tensioner Fluids			N/A	N/A
Will you produce hydrocarbons? If yes fill in for produced water.					
Produced Water	Water brought up from hydrocarbon-bearing strata during extraction of oil & gas	N/A	N/A	N/A	N/A
Will you be covered by an individual or General NPDES permit ?		GMG290000	and MARPOL		
NOTE: If you will not have a type of waste, enter NA in the row.		Red = Drlg Eng, **Yellow** = Completion Eng, **Blue** = Waste Specialist, **Green = Calculator Tool**			

Timothy Weisenberger

PROVIDED BY DRILLING/COMPLETION ENGINEERS

Calculated by Water SME via this Workbook

Assumption - used values form Grand Canyon II and ieither Edison or M/V Breeze 9 days

TABLE 2. WASTES YOU WILL TRANSPORT AND/OR DISPOSE OF ONSHORE

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

Isabella 2 Construction Activity (37 planned installation days)	Projected generated waste	Solid and Liquid Wastes transportation	Waste Disposal		
Type of Waste	**Composition**	**Transport Method**	**Name/Location of Facility**	**Amount (tons) (total for 30 days)**	**Disposal Method**
Will drilling occur? If yes, fill in the muds and cuttings.					
EXAMPLE: Synthetic-based drilling fluid or mud	*internal olefin, ester*	*Below deck storage tanks on offshore support vessels*	*Newport Environmental Services Inc., Ingleside, TX*	*X bbl/well*	*Recycled*
Oil-based drilling fluid or mud	NA	NA	NA	NA	NA
Synthetic-based drilling fluid or mud	NA	NA	NA	NA	NA
Cuttings wetted with Water-based fluid	NA	NA	NA	NA	NA
Cuttings wetted with Synthetic-based fluid	NA	NA	NA	NA	NA
Cuttings wetted with oil-based fluids	NA	NA	NA	NA	NA
Will you produce hydrocarbons? If yes fill in for produced sand.					
Produced sand	NA	NA	NA	NA	NA
Will you have additional wastes that are not permitted for discharge? If yes, fill in the appropriate rows.					
EXAMPLE: trash and debris (recylables)	*Plastic, paper, aluminum*	*barged in a storage bin*	*ARC, New Iberia, LA*	*X tons*	*Recycled*
Chemical product wastes	Pills, spacers, additives etc.	Barged in (totes)	River Birch Landfill, Avondale, LA	NA	Recycle / Landfill / Incineration
Domestic waste	Municipal trash	Barged in (supersacks)	River Birch Landfill, Avondale, LA	0.1	Landfill
Excess cement	Excess cement from vessel tank cleaning	Transported by vehicle (supersacks)	Grand Isle Port Commission or River Birch landfill	NA	Reuse / Landfill
Recyclables	Plastic, paper, aluminum	Barged in (supersacks)	Recycle the Gulf ARC, Iberia, LA	2.8	Recycle
Scrap Metal	Scrap piping, grating and other metals	scrap piping, grating and other metals	Barged in (scrap baskets)	NA	Recycle
Trash and debris	Municipal trash	Barged in (supersacks)	River Birch Landfill, Avondale, LA	2.6	Landfill
Universal Waste	Batteries	Barged in (DOT drums)	L&L Oil and Gas Services, Fourchon, LA	NA	Recycle
Universal Waste	Fluorescent light bulbs	Barged in (DOT drums)	L&L Oil and Gas Services, Fourchon, LA	NA	Recycle
Used oil	Used oil, hydraulic oil	Barged in (DOT drums)	Omega Waste Management, Patterson, LA	3.1	Recycle
Vessel Maintenance Wastes (non hazardous)	Oily rags, pads, oil filters etc.	Barged in (drums or totes)	River Birch Landfill, Avondale, LA	0.1	Recycle
Vessel Maintenance Wastes (painting, blasting)	Paint thinner, paint chips, blast media, aerosol cans	Barged in (drums or totes)	Chemical Waste Management, Sulphur, LA	0.1	Incineration / Landfill
Wash water		Barged in (totes)	River Birch Landfill, Avondale, LA	2.5	Disposal

NOTE: If you will not have a type of waste, enter NA in the row.

Appendix D: Environmental Impact Assessment

Environmental Impact Analysis

For a

DEVELOPMENT OPERATIONS AND COORDINATION DOCUMENT
for
Mississippi Canyon Block 562 (OCS-G-19966)
Offshore Alabama

August 2018

Prepared for:

BP Exploration & Production Inc.
501 Westlake Park Boulevard
Houston, Texas 77079-2696

Prepared by:

CSA Ocean Sciences Inc.
8502 SW Kansas Avenue
Stuart, Florida 34997
Telephone: (772) 219-3000

Contents

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Acronyms and Abbreviations

ADIOS2	Automated Data Inquiry for Oil Spills 2
bbl	barrel
BOEM	Bureau of Ocean Energy Management
BP	BP Exploration & Production Inc.
BSEE	Bureau of Safety and Environmental Enforcement
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
DOCD	Development Operations and Coordination Document
dB re 1 µPa	decibel relative to one micropascal
dB re 1 µPa m	decibel relative to one micropascal at 1 meter
dB re 1 $\mu Pa^2 \cdot s$	decibels relative to 1 micropascal squared × seconds
DP	dynamically positioned
DPS	distinct population segment
EFH	Essential Fish Habitat
EIA	Environmental Impact Analysis
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FAD	fish aggregating device
FR	*Federal Register*
ft	feet
GMFMC	Gulf of Mexico Fishery Management Council
GPS	global positioning system
H_2S	hydrogen sulfide
HAPC	Habitat Area of Particular Concern
Hz	hertz
IPF	impact-producing factor
km	kilometer
m	meter
MARPOL	International Convention for the Prevention of Pollution from Ships
MC	Mississippi Canyon
MMC	Marine Mammal Commission
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service
NAAQS	National Ambient Air Quality Standards
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NO_x	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NTL	Notice to Lessees and Operators
NWR	National Wildlife Refuge
OCS	Outer Continental Shelf
OSRA	Oil Spill Risk Analysis
OSRP	Oil Spill Response Plan
PAH	polycyclic aromatic hydrocarbons
PM	particulate matter
SO_x	sulfur oxides
USCG	U.S. Coast Guard
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VOC	volatile organic compound
WCD	worst case discharge

Introduction

BP Exploration & Production Inc. (BP) is submitting a Development Operations and Coordination Document (DOCD) for Mississippi Canyon (MC) Block 562 (MC 562), Gulf of Mexico, Outer Continental Shelf (OCS)-G-19966. Under this DOCD, BP proposes to install a single well subsea tie-back in BP's Isabela prospect to existing subsea facilities at the Galapagos Oil Loop. The Isabela 2 tree will be tied back to the existing IS PLEM 2 via a new rigid jumper. Power, hydraulics, and chemicals will be delivered from the existing Isabela infield umbilical to the Isabela 2 tree. Services will be taken from the existing far end UTA of the Isabela infield umbilical and re-routed appropriately via flying leads. A new subsea metering skid (SMS) will tie into the existing Isabela UTA via flying leads to route chemicals to the Isabela 2 tree. This report provides the Environmental Impact Analysis (EIA) for the activities proposed by BP.

MC 562 is located within the Central Gulf of Mexico OCS Planning Area, approximately 64 statute miles (103 kilometers [km]) from the nearest shoreline (Plaquemines Parish, Louisiana), 125 statute miles (201 km) from the regional onshore support base (Port Fourchon, Louisiana), and 168 statute miles (269 km) from the helicopter base at Houma, Louisiana (**Figure 1**). The water depth at the location of the proposed activities is approximately 1,962 meters (m) (6,436 feet [ft]). A dynamically positioned (DP) construction vessel is anticipated to be on site for approximately 37 days.

The EIA for this DOCD was prepared for submittal to the Bureau of Ocean Energy Management (BOEM) in accordance with applicable regulations, including Title 30 Code of Federal Regulations (CFR) 550.242(s) and 550.261. The EIA is a project- and site-specific analysis of the potential environmental impacts of BP's planned activities. The EIA complies with guidance provided in existing Notices to Lessees and Operators (NTLs) issued by BOEM and its predecessors, Minerals Management Service (MMS) and Bureau of Ocean Energy Management, Regulation and Enforcement, including NTLs 2008-G04 (extended by 2015-N02). Potential impacts from offshore oil and gas activities have been analyzed at a broader level in the 2017 to 2022 Programmatic Environmental Impact Statement (EIS) for the OCS Oil and Gas Leasing Program (BOEM, 2016a) and in multisale EISs for the Western and Central Gulf of Mexico Planning Areas (BOEM, 2012a, b, 2013, 2014, 2015, 2016b, 2017a, b). The most recent multisale EIS contains updated environmental baseline information after the Macondo (*Deepwater Horizon*) incident and addresses potential impacts of a catastrophic spill (BOEM, 2012a, b, 2013, 2014, 2015, 2016b, 2017a, b). The impact analyses from those documents are incorporated here by reference.

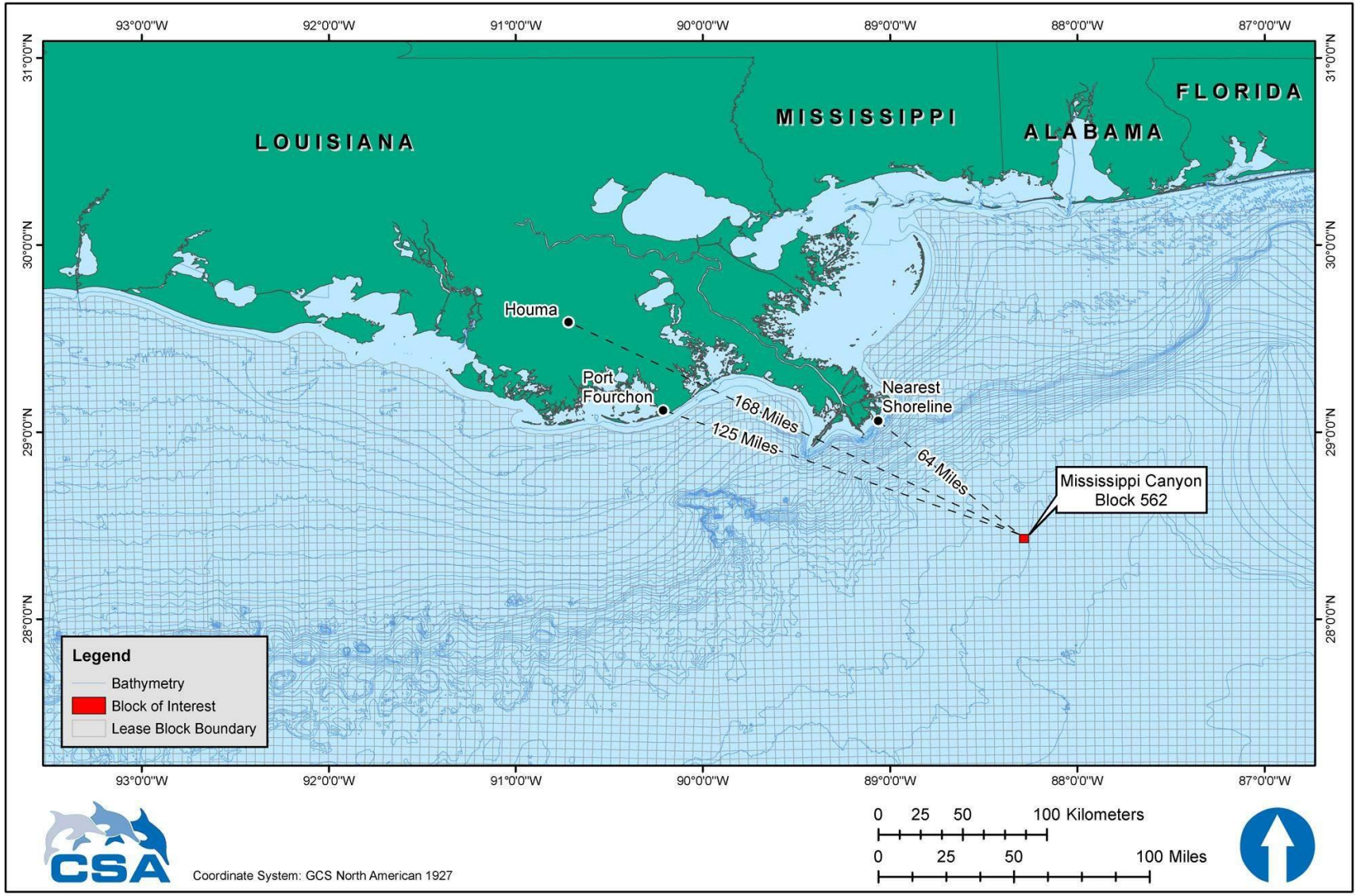

Figure 1. Location of Mississippi Canyon Block 562 in the Gulf of Mexico.

Oil spill response-related activities under BP's DOCD are governed by the BP Regional Oil Spill Response Plan (OSRP), as filed by the Gulf of Mexico Region of BP Exploration & Production Inc. (Operator No. 02481) on 16 April 2018. The OSRP was approved by the Bureau of Safety and Environmental Enforcement (BSEE) on 17 May 2018. The BP OSRP is expected to meet the requirements contained in 30 CFR Part 254. BP has demonstrated oil spill financial responsibility for the facilities proposed in this DOCD, according to 30 CFR Part 553 and NTL No. 2008-N05, "Guidelines for Oil Spill Financial Responsibility for Covered Facilities." The OSRP details BP's plan for response to manage oil spills that may result from drilling, production and associated operations. BP has designed its response program based on a regional capability of response to spills ranging from small operations-related spills to a worst case discharge (WCD) from a well blowout. BP's spill response program is intended to meet the planning requirements of the relevant coastal states and applicable federal oil spill planning regulations. The OSRP includes information regarding BP's incident management team and dedicated response assets, potential spill risks, and local environmentally sensitive areas. The OSRP describes personnel and equipment mobilization, the incident management team organization, and an overview of strategies, actions and notifications to be taken in the event of a spill.

The EIA is organized into **Sections A** through **I** corresponding to the information required by NTLs 2008-G04 and 2015-N01. The main impact-related discussions are in **Section A** (Impact-Producing Factors) and **Section C** (Impact Analysis). **Table 1** lists and summarizes the NTLs applicable to the EIA.

Table 1. Notices to Lessees and Operators (NTLs) applicable to the Environmental Impact Analysis (EIA).

NTL	Title	Summary
BOEM-2016-G01	Vessel Strike Avoidance and Injured/Dead Protected Species Reporting	Recommends protected species identification training; recommends that vessel operators and crews maintain a vigilant watch for marine mammals and slow down or stop their vessel movement to avoid striking protected species; and requires operators to report sightings of any injured or dead protected species.
BOEM-2016-G02	Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program	Summarizes seismic survey mitigation measures, updates regulatory citations, and provides clarification on how the measures identified in the NTL will be used by the Bureau of Ocean Energy Management (BOEM), Bureau of Safety and Environmental Enforcement, and operators in order to comply with the Endangered Species Act and the Marine Mammals Protection Act.
BSEE-2015-G03	Marine Trash and Debris Awareness and Elimination	Instructs operators to exercise caution in the handling and disposal of small items and packaging materials; requires the posting of instructional placards at prominent locations on offshore vessels and structures; and mandates a yearly marine trash and debris awareness training and certification process.
BOEM 2015-N02	Elimination of Expiration Dates on Certain Notices to Lessees and Operators Pending Review and Reissuance	Eliminates expiration dates (past or upcoming) of all NTLs currently posted on the BOEM website.
BOEM 2014-G04	Military Warning and Water Test Areas	Provides contact links to individual command headquarters for the military warning and water test areas in the Gulf of Mexico.

Table 1. (Continued).

NTL	Title	Summary
BSEE 2014-N01	Elimination of Expiration Dates on Certain Notices to Lessees and Operators Pending Review and Reissuance	Eliminates expiration dates (past or upcoming) of all NTLs currently posted on the BSEE website.
BSEE-2012-N06	Guidance to Owners and Operators of Offshore Facilities Seaward of the Coast Line Concerning Regional Oil Spill Response Plans	Provides clarification, guidance, and information for preparation of regional Oil Spill Response Plans. Recommends description of response strategy for worst-case discharge scenarios to ensure capability to respond to oil spills is both efficient and effective.
2011-JOINT-G01	Revisions to the List of OCS Blocks Requiring Archaeological Resource Surveys and Reports	Provides new information of which OCS blocks require archaeological surveys and reports; identifies required survey line spacing in each block. This NTL augments NTL 2005-G07.
2010-N10	Statement of Compliance with Applicable Regulations and Evaluation of Information Demonstrating Adequate Spill Response and Well Containment Resources	Informs operators using subsea or surface blowout preventers on floating facilities that applications for well permits must include a statement signed by an authorized company official stating that the operator will conduct all activities in compliance with all applicable regulations, including the increased safety measures regulations (75 *Federal Register* [FR] 63346). Informs operators that the Bureau of Ocean Energy Management will be evaluating whether each operator has submitted adequate information demonstrating that it has access to and can deploy containment resources to respond promptly to a blowout or other loss of well control.
2009-G40	Deepwater Benthic Communities	Provides guidance for avoiding and protecting high-density deepwater benthic communities (including chemosynthetic and deepwater coral communities) from damage caused by OCS oil and gas activities in water depths greater than 300 m (984 ft). Prescribes separation distances of 610 m (2,000 ft) from each mud and cuttings discharge location and 76 m (250 ft) from all other seafloor disturbances.
2009-G39	Biologically Sensitive Underwater Features and Areas	Provides guidance for avoiding and protecting biologically sensitive features and areas (i.e., topographic features, pinnacles, low relief live bottom areas, and other potentially sensitive biological features) when conducting OCS operations in water depths less than 300 m (984 ft) in the Gulf of Mexico.
2008-G04	Information Requirements for Exploration Plans and Development Operations Coordination Documents	Provides guidance on information requirements for OCS plans, including EIA requirements and information regarding compliance with the provisions of the Endangered Species Act and Marine Mammal Protection Act.
2008-N05	Guidelines for Oil Spill Financial Responsibility (OSFR) for Covered Facilities	Provides clarification and guidance to operators/lessees on policies for submitting required OSFR documents to the Gulf of Mexico OCS Region as required under 30 CFR Part 253.
2005-G07	Archaeological Resource Surveys and Reports	Provides guidance on regulations regarding archaeological discoveries, specifies requirements for archaeological resource surveys and reports, and outlines options for protecting archaeological resources.

A. Impact-Producing Factors

Based on the description of BP's proposed activities, a series of impact-producing factors (IPFs) have been identified; IPFs include both routine activities and accidental events. **Table 2** identifies the environmental resources that may be affected in the left column, and identifies sources of impacts associated with the proposed project across the top. **Table 2,** adapted from Form BOEM-0142, has been developed *a priori* to focus the impact analysis on those resources that may be impacted as a result of one or more IPFs. An "X" indicates that an IPF could reasonably be expected to affect a certain resource, and a dash (--) indicates no impact or negligible impact. Where there may be an effect, an analysis is provided in **Section C**. Potential IPFs for the proposed activities are listed below and briefly discussed in the following sections.

- DP construction vessel presence (including sound and lights);
- Physical disturbance to the seafloor;
- Air pollutant emissions;
- Effluent discharges;
- Water intake;
- Onshore waste disposal;
- Marine debris;
- Support vessel and helicopter traffic (includes vessel collisions with resources and marine sound); and
- Accidents.

Table 2. Matrix of impact-producing factors (IPF) and affected environmental resources. X = potential impact; dash (--) = no impact or negligible impact.

Environmental Resources	Impact-Producing Factors									
	DP Construction Vessel Presence (incl. sound & lights)	Physical Disturbance to Seafloor	Air Pollutant Emissions	Effluent Discharges	Water Intake	Onshore Waste Disposal	Marine Debris	Support Vessel/Helo Traffic	Accidents	
									Small Fuel Spill	Large Fuel Spill
Physical/Chemical Environment										
Air quality	--	--	--X(9)	--	--	--	--	--	X(6)	X(6)
Water quality	--	--	--	X	--	--	--	--	X(6)	X(6)
Seafloor Habitats and Biota										
Soft bottom benthic communities	--	X	--	--	--	--	--	--	--	--
High-density deepwater benthic communities	--	--(4)	--	--(4)	--	--	--	--	--	--
Designated topographic features	--	--(1)	--	--(1)	--	--	--	--	--	--
Pinnacle trend area live bottoms	--	--(2)	--	--(2)	--	--	--	--	--	--
Eastern Gulf live bottoms	--	--(3)	--	--(3)	--	--	--	--	--	--
Threatened, Endangered, and Protected Species and Critical Habitat										
Sperm whale (endangered)	X(8)	--	--	--	--	--	--	X(8)	X(6,8)	X(6,8)
West Indian manatee (threatened)	--	--	--	--	--	--	--	X(8)	--	X(6,8)
Non-endangered marine mammals (protected)	X	--	--	--	--	--	--	X	X(6)	X(6)
Sea turtles (endangered/threatened)	X(8)	--	--	--	--	--	--	X(8)	X(6,8)	X(6,8)
Piping Plover (threatened)	--	--	--	--	--	--	--	--	--	X(6)
Whooping Crane (endangered)	--	--	--	--	--	--	--	--	--	X(6)
Oceanic whitetip shark (threatened)	X									X(6)
Gulf sturgeon (threatened)	--	--	--	--	--	--	--	--	--	X(6)
Beach mice (endangered)	--	--	--	--	--	--	--	--	--	X(6)
Threatened coral	--	--	--	--	--	--	--	--	--	X(6)
Coastal and Marine Birds										
Marine birds	X	--	--	--	--	--	--	X	X(6)	X(6)
Shorebirds and coastal nesting birds	--	--	--	--	--	--	--	X	--	X(6)
Fisheries Resources										
Pelagic communities and ichthyoplankton	X	--	--	X	X	--	--	--	X(6)	X(6)
Essential Fish Habitat	X	--	--	X	X	--	--	--	X(6)	X(6)
Archaeological Resources										
Shipwreck sites	--	--(7)	--	--	--	--	--	--	--	X(6)
Prehistoric archaeological sites	--	--(7)	--	--	--	--	--	--	--	X(6)
Coastal Habitats and Protected Areas										
Barrier beaches and dunes	--	--	--	--	--	--	--	X	--	X(6)
Wetlands and seagrass beds	--	--	--	--	--	--	--	X	--	X(6)
Coastal wildlife refuges and wilderness areas	--	--	--	--	--	--	--	--	--	X(6)
Socioeconomic and Other Resources										
Recreational and commercial fishing	X	--	--	--	--	--	--	--	X(6)	X(6)
Public health and safety	--	--	--	--	--	--	--	--	--	X(6)
Employment and infrastructure	--	--	--	--	--	--	--	--	--	X(6)
Recreation and tourism	--	--	--	--	--	--	--	--	--	X(6)
Land use	--	--	--	--	--	--	--	--	--	X(6)
Other marine uses	--	--	--	--	--	--	--	--	--	X(6)

X indicates potential impact; dash (--) indicates no impact or negligible impact; numbers refer to table footnotes; Helo = helicopter.

Table 2 Footnotes and Applicability to this Program:

*Footnotes are numbered to correspond to entries in **Table 2**; applicability to each case is noted by a bullet point following the footnote.*

(1) Activities that may affect a marine sanctuary or topographic feature. Specifically, if the well, rig site, or any anchors will be on the seafloor within the following:

(a) 4-mile zone of the Flower Garden Banks, or the 3-mile zone of Stetson Bank;

(b) 1,000-m, 1-mile, or 3-mile zone of any topographic feature (submarine bank) protected by the Topographic Features Stipulation attached to an Outer Continental Shelf (OCS) lease;

(c) Essential Fish Habitat (EFH) criteria of 152 m (500 ft) from any no-activity zone; or

(d) Proximity of any submarine bank (152 m [500-ft] buffer zone) with relief greater than 2 m (7 ft) that is not protected by the Topographic Features Stipulation attached to an OCS lease.

- None of these conditions (a through d) are applicable. The project area is not within or near any marine sanctuary, topographic feature, submarine bank, or no-activity zone.

(2) Activities with any bottom disturbance within an OCS lease block protected through the Live Bottom (Pinnacle Trend) Stipulation attached to an OCS lease.

- The Live Bottom (Pinnacle Trend) Stipulation is not applicable to the project area.

(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.

- The Live Bottom (Low-Relief) Stipulation is not applicable to the project area.

(4) Activities on blocks designated by the BOEM as being in water depths 400 m or greater.

- No impacts are anticipated to high-density deepwater benthic communities. There are no features indicative of seafloor hard bottom that could support high-density chemosynthetic communities or coral communities within 610 m (2,000 ft) of the location of the proposed activities (BP, 2018).

(5) Exploration or production activities where Hydrogen Sulfide (H_2S) concentrations greater than 500 ppm might be encountered.

- Mississippi Canyon (MC) Block 562 (MC 562) is classified as H_2S absent under a previously approved Exploration Plan.

(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.

- Accidental hydrocarbon spills could affect the resources marked (X) in the matrix, and impacts are analyzed in **Section C**.

(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 prehistoric site that no impact would occur, the EIA can note that in a sentence or two.

- No impacts are expected to archaeological resources. While MC 562 is on the list of high-probability blocks for shipwrecks (BOEM, 2011), the project area is well beyond the 60-m depth contour used by BOEM as the seaward extent for prehistoric archaeological site potential in the Gulf of Mexico. The site clearance letter (BP, 2018), reported that no archaeologically significant sonar contacts were identified within 610 m (2,000 ft) of location of the proposed activities.

(8) All activities that you determine might have an adverse effect on endangered or threatened marine mammals or sea turtles or their critical habitats.

- IPFs that may affect marine mammals, sea turtles, or their critical habitats include DP construction vessel presence, support vessel and helicopter traffic, and accidents. See **Section C**.

(9) Production activities that involve transportation of produced fluids to shore using shuttle tankers or barges.

- Not applicable.

A.1 DP Construction Vessel Presence (Including Underwater Sound and Surface Lights)

The subsea well tie back seafloor infrastructure proposed in this DOCD will be installed using a DP construction vessel. DP vessels use a global positioning system (GPS), specific computer software, and sensors in conjunction with a series of thrusters to maintain position. Through satellite navigation and position reference sensors, the location of the vessel is precisely monitored while thrusters, positioned at various locations about the rig pontoons, are activated to maintain position. This allows operations at sea in areas where mooring or anchoring is not feasible. Consequently, there will be no anchoring during installation activities in MC 562 during this project. The selected DP construction vessel is expected to be on site for an estimated 37 days, inclusive of mobilization and demobilization time. The DP construction vessel will maintain exterior lighting in accordance with applicable federal navigation and aviation safety regulations (International Regulations for Preventing Collisions at Sea, 1972 [72 COLREGS], Part C).

Potential impacts to marine resources from the DP construction vessel include the physical presence of the vessel in the ocean, working and safety lighting, and underwater sound produced during installation operations.

The physical presence of the DP construction vessel in the ocean can attract and potentially impact pelagic marine resources, as discussed in **Section C.5.1**. Offshore vessels maintain exterior lighting for working at night and for navigational and aviation safety in accordance with applicable federal safety regulations. This artificial lighting may also attract and directly or indirectly impact natural resources. Installation operations produce underwater sounds that may impact certain marine resources. Sources of installation-related sounds include, for example, DP thrusters, deck machinery, remotely operated vehicle operations and seabed mounted active acoustics (such as ultra-short baseline systems) for positioning.

The installation operations and equipment can be expected to produce noise associated with propulsion machinery that transmits directly to the water during station keeping, installation, and maintenance operations. Additional sound and vibration are transmitted through the hull to the water from auxiliary machinery, such as generators, pumps, and compressors (Richardson et al., 1995). The noise levels produced by DP vessels for station-keeping are largely dependent on the level of thruster activity required to keep position and vary based on local ocean currents, sea and weather conditions, and operational requirements. Representative source levels for vessels in DP activities range from 184 to 190 decibels relative to one micropascal (dB re 1 µPa), with a primary amplitude frequency below 600 hertz (Hz) (Blackwell and Greene Jr., 2003, McKenna et al., 2012, Kyhn et al., 2014).

A.2 Physical Disturbance to the Seafloor

The proposed operations will only cause physical disturbance to the seafloor in the immediate vicinity of the installation locations of the SMS and electrical flying leads. The proposed subsea tie-in via rigid jumper has no seafloor flowline. The tie-in is approximately 30 m (90 ft) in length and will not touch the seafloor.

A.3 Air Pollutant Emissions

The air pollutant emissions are calculated in accordance with BOEM requirements and summarized in the Air Quality Emissions Report in DOCD Section 8. The primary air pollutants typically associated with OCS activities are suspended particulate matter (PM), sulfur oxides (SO_x), nitrogen oxides (NO_x), volatile organic compounds (VOCs), and carbon monoxide (CO). These emissions occur mainly from combustion of fuels by diesel and natural gas powered generators, pumps, and motors.

The Air Quality Emissions Report indicates that the projected emissions are below exemption levels set by the applicable regulations in 30 CFR 550.303 for all pollutants. No further evaluation will be required.

A.4 Effluent Discharges

Effluent discharges are summarized in DOCD Section 7. All offshore discharges are expected to meet the requirements of the National Pollutant Discharge Elimination System (NPDES) General Permit issued by the U.S. Environmental Protection Agency (USEPA) and/or MARPOL and any applicable U.S. Coast Guard (USCG) regulations.

Other effluent discharges are expected to include treated sanitary and domestic wastes and deck drainage. Miscellaneous discharges of seawater and freshwater from the vessels to which treatment chemicals have been added are anticipated to include ballast water, bilge water, fire water, and cooling water.

There are planned discharges of chemically treated water fluids during the commissioning phase of the project. The discharges will be in accordance with the conditions of NPDES permit/BSEE approvals.

Under certain circumstances, the installation vessel may relocate to a safe zone which is not located within the leased area to avoid severe weather or loop currents, or to conduct routine maintenance while idled from installation activities. During these limited times of safe zone harboring, incidental vessel discharges may occur. These discharges are expected to be within the limits represented in the waste and water discharge table estimates submitted as part of this DOCD and permitted under the NPDES permit.

A.5 Water Intake

Seawater will be drawn from the ocean for once-through, non-contact cooling of machinery. Section 316(b) of the Clean Water Act requires NPDES permits to ensure that the location, design, construction, and capacity of cooling water intake structures reflect the best technology available to minimize adverse environmental impact from impingement and entrainment of aquatic organisms. The General NPDES Permit specifies design requirements for facilities for which construction commenced after 17 July 2006 with a cooling water intake structure having a design intake capacity of greater than two million gallons of water per day, of which at least 25% is used for cooling purposes. It is expected that the DP construction vessel ultimately selected for this project will be in compliance with all applicable cooling water intake structure design requirements, monitoring, and limitations. Where applicable, the DP construction vessel operator takes responsibility for obtaining necessary NPDES permit coverage for its cooling water intake structure and associated permit compliance.

A.6 Onshore Waste Disposal

A list of the solid and liquid wastes generated during this project to be disposed of onshore are tabulated in DOCD Section 7.1. Typical waste streams requiring onshore disposal from a project of this nature include the following:

- Domestic (e.g., municipal trash) and universal wastes (e.g., batteries, florescent light bulbs);
- Nonhazardous domestic recyclables (e.g., plastic, paper, aluminum);
- Scrap metal;
- Radioactive waste; and
- Miscellaneous unused chemicals.

These waste streams are expected to be segregated on the installation vessel and transported to shore for disposal in an appropriately permitted facility. All other wastes generated by BP and its contractors are managed by their respective waste management procedures. Compliance with established practices and procedures is expected to result in either no or negligible impacts from this factor.

A.7 Marine Debris

BP intends to comply with all applicable regulations relating to solid waste handling, transportation and disposal, including the International Convention for the Prevention of Pollution from Ships (MARPOL 73/78) Annex V requirements, and USEPA, USCG, BSEE, and BOEM regulations. These regulations include prohibitions and compliance requirements regarding the deliberate discharging of containers and other similar materials (i.e., trash and debris) into the marine environment as well as the protective measures to be implemented to prevent the accidental loss of solid material into the marine environment. For example, BSEE regulations 30 CFR 250.300(a) and (b)(6) prohibit operators from deliberately discharging containers and other similar materials (i.e., trash and debris) into the marine environment, and 30 CFR 250.300(c) requires durable identification markings on equipment, tools, containers (especially drums), and other material. The USEPA and USCG regulations require operators to be proactive in avoiding accidental loss of solid materials by developing waste management plans, posting informational placards, manifesting trash sent to shore, and using special precautions such as covering outside trash bins to prevent accidental loss of solid waste. In addition to the regulations in 30 CFR 250, BSEE issued NTL BSEE-2015-G03 which instructs operators to exercise caution in handling and disposal of small items and packaging materials, requires posting of placards at prominent locations on offshore vessels and structures, and mandates a yearly training and certification process for marine trash and debris awareness. Compliance with these requirements is expected to result in either no or negligible impacts from this factor.

A.8 Support Vessel and Helicopter Traffic

BP will use existing shorebase facilities at Port Fourchon, Louisiana, for support vessel activities. Support helicopters are expected to be based at heliport facilities in Houma, Louisiana. No terminal expansion or construction is planned at either location to support the proposed project.

The project will be supported by supply vessels making an estimated two round trips per week. The boats typically move to the project area via the most direct route from the shorebase.

A helicopter will make approximately two round trips per week between the project area and the heliport. The helicopter will be used to transport personnel and small supplies and will normally take the most direct route of travel between the shorebase and the project area when air traffic and weather conditions permit. Offshore support helicopters typically maintain a minimum altitude of 213 m (700 ft) while in transit offshore, 305 m (1,000 ft) over unpopulated areas or across coastlines, and 610 m (2,000 ft) over populated areas and sensitive habitats such as wildlife refuges and park properties. Additional guidelines and regulations specify that helicopters maintain an altitude of 305 m (1,000 ft) within 91 m (300 ft) of marine mammals (BOEM, 2012a).

Table 3 summarizes the estimated fuel capacity and trip frequency of the support vessels and aircraft.

Table 3. Support vessel and aircraft fuel capacity and trip frequency or duration in Mississippi Canyon Block 562 during the proposed project.

Vessel/Aircraft Type	Maximum Fuel Tank Storage Capacity	Maximum No. in Area at Any Time	Trip Frequency or Duration
Helicopter	760 gal	2	2 flights per week
Supply Boats	5,000 bbl	2	2 trips per week

gal = gallons; bbl = barrel.

Offshore support vessels associated with the proposed project will contribute to the overall acoustic environment by transmitting noise through both air and water. The support vessels will use conventional diesel-powered screw propulsion. Vessel noise is a combination of narrow band (tonal) and broadband sound (Richardson et al., 1995, Hildebrand, 2009, McKenna et al., 2012). Tones of very low frequency typically dominate up to approximately 50 Hz, whereas broadband sounds may extend to 100 kHz. The primary sources of vessel noise are propeller cavitation, propeller singing, and propulsion; other sources include engine noise, flow noise from water dragging along the hull, and bubbles breaking in the vessel's wake (Richardson et al., 1995). The intensity of noise from support vessels is roughly related to ship size, weight, and speed. Broadband source levels for smaller boats (a category that include supply and other service vessels) are in the range of 150 to 180 dB re 1 µPa at 1 meter (dB re 1 µPa m) (Richardson et al., 1995, Hildebrand, 2009, McKenna et al., 2012).

Penetration of aircraft noise below the sea surface is greatest directly below the aircraft. Aircraft noise produced at angles greater than 13 degrees from vertical is mostly reflected from the sea surface and does not propagate into the water (Richardson et al., 1995). The duration of underwater sound from passing aircraft is much shorter in water than air; for example, a helicopter passing at an altitude of 152 m (500 ft) that is audible in air for 4 minutes may be detectable under water for only 38 seconds at 3 m (10 ft) depth and for 11 seconds at 18 m (59 ft) depth (Richardson et al., 1995).

Dominant tones in noise spectra from helicopters are below 500 Hz with a source level of approximately 149 to 151 dB re 1 Pa m (for a Bell 212 helicopter) (Richardson et al., 1995). Levels of noise received underwater from passing aircraft depend on the aircraft's altitude, the aspect (direction and angle) of the aircraft relative to the receiver, receiver depth, water depth, and seafloor type (Richardson et al., 1995). Received level diminishes with increasing receiver

depth when an aircraft is directly overhead, but may be stronger at mid-water than at shallow depths when an aircraft is not directly overhead (Richardson et al., 1995). Because of the relatively high expected airspeeds during transits and these physical variables, aircraft-related noise (including both airborne and underwater noise) is expected to be very brief in duration.

A.9 Accidents

The accidents addressed in the EIA focuses on the following two potential types:

- a small fuel spill, which is the most likely type of spill during OCS offshore activities; and
- a large fuel spill, up to and including the WCD for this DOCD.

The following subsections summarize assumptions about the sizes and fates of these spills as well as BP's spill response plans. Impacts are analyzed in **Section C**.

Recent EISs (BOEM, 2012a, b, 2013, 2014, 2015, 2016b, 2017a, b) analyzed other types of accidents relevant to offshore oil and gas operations that could lead to potential impacts to the marine environment. Vessel collisions, dropped objects, chemical spills, and a hydrogen sulfide (H_2S) release are discussed briefly below.

Vessel Collisions. BSEE (2017) data show that there were 168 OCS-related collisions between 2007 and 2018. Most collision mishaps are the result of service vessels colliding with platforms or vessel collisions with pipeline risers. Approximately 10% of vessel collisions with platforms and/or rigs in the OCS resulted in diesel spills, and in several collision incidents, fires resulted from hydrocarbon releases. To date, the largest diesel spill associated with a collision occurred in 1979 when an anchor-handling boat collided with a drilling platform in the Main Pass lease area, spilling 1,500 barrels (bbl). Diesel fuel is the product most frequently spilled, but oil, natural gas, corrosion inhibitor, hydraulic fluid, and lube oil have also been released as the result of vessel collisions. Human error accounted for approximately half of all reported vessel collisions from 2006 to 2009. As summarized by BOEM (2017a), vessel collisions occasionally occur during routine operations. Some of these collisions have caused spills of diesel fuel or chemicals. BP intends to comply with all applicable USCG and BOEM safety requirements to minimize the potential for vessel collisions.

Dropped Objects. Objects dropped overboard the DP construction vessel could potentially pose a risk to existing live subsea pipelines or other infrastructure. If a dropped pipe or other subsea equipment landed on existing seafloor infrastructure, loos of integrity of seafloor pipelines, umbilicals, etc. could result in a spill. BP intends to comply with all BOEM and BSEE safety requirement to minimize the potential for objects dropped overboard.

Chemical Spills. For BP's proposed project, chemicals will be used for SFL flushing, pressure testing, and leak testing of new subsea equipment. Any potential leak due to pressure testing failure will be limited to a single line leak and would be limited to less than 1 bbl. Potentially spilled fluids include Transaqua HT, MEG 50/50, or methanol. Between 2007 and 2014, an average of two chemical spills <50 bbl in volume and three chemical spills >50 bbl in volume occurred each year (BOEM, 2017a).

H_2S Release. MC 562 is classified as H_2S absent.

A.9.1 Small Fuel Spill

Spill Size. According to the analysis by BOEM (2017b), the most likely type of small spill (<1,000 bbl) resulting from OCS activities is a failure related to the storage of oil or diesel fuel. Historically, most diesel spills have been ≤1 bbl, and this is predicted to be the most common spill volume in ongoing and future OCS activities in the Western and Central Gulf of Mexico Planning Areas (Anderson et al., 2012). As the spill volume increases, the incident rate declines dramatically (BOEM, 2017a). The median size for spills ≤1 bbl is 0.024 bbl, and the median volume for spills of 1 to 10 bbl is 3 bbl (Anderson et al., 2012). For the EIA, a small diesel fuel spill of 3 bbl is assumed as the volume of a small fuel spill as operational experience suggests that the most likely cause of such a spill would be a rupture of the fuel transfer hose resulting in a loss of contents of approximately 3 bbl (BOEM, 2012a).

Spill Fate. The fate of a small fuel spill in the project area would depend on meteorological and oceanographic conditions at the time as well as the effectiveness of spill response activities. However, given the open ocean location of the project area and response actions, it is expected that impacts from a small spill would be minimal (BOEM, 2016a).

The water-soluble fractions of diesel are dominated by two- and three-ringed polycyclic aromatic hydrocarbons (PAHs), which are moderately volatile (National Research Council, 2003a). The constituents of diesel fuel are light to intermediate in molecular weight and can be readily degraded by aerobic microbial oxidation. The National Oceanic and Atmospheric Administration (NOAA) has reported that diesel fuel is readily and completely degraded by naturally occurring microbes (NOAA, 2006). Due to its light density, diesel will not sink to the seafloor. Diesel dispersed in the water column can adhere to suspended sediments, but this generally occurs only in coastal areas with high suspended solids loads (National Research Council, 2003a) and would not be expected to occur to any appreciable degree in offshore waters of the Gulf of Mexico.

Sheens from small fuel spills are expected to persist for relatively short periods of time, ranging from minutes (<1 bbl) to hours (<10 bbl) to a few days (10 to 1,000 bbl), and disperse and evaporate (BOEM, 2012a).

For purposes of the EIA, the fate of a small diesel fuel spill was estimated using the NOAA's Automated Data Inquiry for Oil Spills 2 (ADIOS2) model (NOAA, 2016a). This model uses the physical properties of oils in its database to predict the rate of evaporation and dispersion over time as well as changes in the density, viscosity, and water content of the product spilled. It is estimated that over 90% of a small diesel spill is expected to be evaporated or dispersed within 24 hours. The area of the sea surface with diesel fuel on it during this 24-hour period would range from 0.5 to 5 ha (1.2 to 12 ac), depending on sea state and weather conditions.

The ADIOS2 results, coupled with spill trajectory information discussed below for a large spill, indicate that a small fuel spill would not impact coastal or shoreline resources. The project area is 64 statute miles (103 km) from the nearest shoreline (Plaquemines Parish, Louisiana). Slicks from small fuel spills are expected to persist for relatively short periods of time ranging from minutes (<1 bbl) to hours (<10 bbl) to a few days (10 to 1,000 bbl) and rapidly spread out, evaporate, and disperse into the water column (BOEM, 2012a). Because of the distance of these potential spills on the OCS and their lack of persistence, it is unlikely that a spill would make landfall prior to dissipation (BOEM, 2012a).

Spill Response. In the unlikely event the shipboard procedures fail to prevent a fuel spill, response equipment and trained personnel would be activated so that any spill effects would be localized and would result only in short-term environmental consequences. Oil Spill Information can be found in Section 9 of the DOCD.

Weathering. Following a diesel fuel spill, several physical, chemical, and biological processes, collectively called weathering, interact to change the physical and chemical properties of the diesel, and thereby influence its harmful effects on marine organisms and ecosystems. The most important weathering processes include spreading, evaporation, dissolution, dispersion into the water column, formation of water-in-oil emulsions, photochemical oxidation, microbial degradation, adsorption to suspended particulate matter, and stranding on shore or sedimentation to the seafloor (National Research Council, 2003a).

Weathering decreases the concentration of diesel fuel and produces changes in its chemical composition, physical properties, and toxicity. The more toxic, light aromatic and aliphatic hydrocarbons are lost rapidly by evaporation and dissolution from the slick on the water surface. Evaporated hydrocarbons are degraded rapidly by sunlight. Biodegradation of diesel fuel on the water surface and in the water column by marine bacteria removes first the n-alkanes and then the light aromatics. Other petroleum components are biodegraded more slowly (National Research Council, 2003a). Diesel fuel spill response-related activities for facilities included in this DOCD are governed by BP's Regional OSRP, which meets the requirements contained in 30 CFR 254.

A.9.2 Large Hydrocarbon Spill (Worst Case Discharge)

Spill Size. As there is no drilling associated with this DOCD, the WCD entails a complete loss of contents of the largest fuel tank of the DP construction vessel (16,800 bbl of diesel fuel with American Petroleum Institute gravity [API gravity] of 35°).

Spill Probability. Oil Spill Information can be found in Section 9 of the DOCD. BP will also comply with NTL 2010-N10 and applicable regulations in 30 CFR Part 250, Subpart D, which specify additional safety measures for OCS activities.

Spill Trajectory. The fate of a large hydrocarbon spill in the project area would depend on meteorological and oceanographic conditions at the time. The Oil Spill Risk Analysis (OSRA) model is a computer simulation of oil spill transport that uses realistic data for winds and currents to predict spill trajectory. The OSRA report by Ji et al. (2004) provides conditional contact probabilities for shoreline segments in the Gulf of Mexico. The OSRA model is not intended to project the trajectory of diesel fuel, as diesel is more volatile than crude oil and usually evaporates or disperses within 24 hours of a spill. However, the OSRA results are presented in the EIA to account for a potential "worst-case" for the unlikely event that diesel fuel does contact the shoreline.

The results for Launch Area 59 (where MC 562 is located) are presented in **Table 4**. The model predicts a <0.5% chance of shoreline contact within 3 days of a spill, and a 1% to 5% chance of shoreline contact within 10 days of a spill (Lafourche and Plaquemines Parishes). Shoreline contact is predicted within 30 days for shorelines ranging from Cameron Parish, Louisiana, to Bay County, Florida. The conditional probability of shoreline contact is low (1% to 2%) for most shorelines with predicted contact within 30 days. However, the conditional probability of shoreline contact to Plaquemines Parish, Louisiana is 11% within 30 days.

The original OSRA modeling runs reported by Ji et al. (2004) did not evaluate the fate of a spill over time periods exceeding 30 days, nor did they estimate the fate of a release that continues over a period of weeks or months. As noted by Ji et al. (2004), the OSRA model does not consider the chemical composition or biological weathering of oil spills, the spreading and splitting of oil spills, or spill response activities. The model does not specify a particular spill size but has been used by BOEM to evaluate contact probabilities for spills greater than 1,000 bbl.

Table 4. Conditional probabilities of a spill in Mississippi Canyon Block 562 (MC 562) contacting shoreline segments based on the 30-day Oil Spill Risk Analysis (OSRA) (From: Ji et al., 2004). Values are conditional probabilities that a hypothetical spill in MC 562 (represented by OSRA Launch Area 59) could contact shoreline segments within 3, 10, or 30 days.

Shoreline Segment	County or Parish and State	Conditional Probability of Contact[1] (%)		
		3 Days	10 Days	30 Days
C13	Cameron Parish, Louisiana	--	--	1
C14	Vermilion Parish, Louisiana	--	--	1
C17	Terrebonne Parish, Louisiana	--	--	2
C18	Lafourche Parish, Louisiana	--	1	2
C19	Jefferson Parish, Louisiana	--	--	1
C20	Plaquemines Parish, Louisiana	--	5	11
C21	St. Bernard Parish, Louisiana	--	--	2
C29	Walton County, Florida	--	--	1
C30	Bay County, Florida	--	--	1

[1] Conditional probability refers to the probability of contact within the stated time period, assuming that a spill has occurred (-- indicates <0.5%).

BOEM presented additional OSRA modeling to simulate a spill that continues for 90 consecutive days, with each trajectory tracked for 60 days during four seasons. In this updated OSRA model (herein referred to as the 60-day OSRA model), 60 days was chosen as a conservative estimate of the maximum duration that spilled oil would persist on the sea surface following a spill (BOEM, 2017c). The spatial resolution is limited, with five launch points in the entire Western and Central Planning Areas of the Gulf of Mexico. These launch points were deliberately located in areas identified as having a high possibility of containing large oil reserves. The 60-day OSRA model launch point most appropriate for modeling a spill in the project area is Launch Point 2. The 60-day OSRA results for Launch Point 2 are presented in **Table 5**.

Table 5. Shoreline segments with a 1% or greater conditional probability of contact from a spill starting at Launch Point 2 based on the 60-day Oil Spill Risk Analysis. Values are conditional probabilities that a hypothetical spill in the project area could contact shoreline segments within 60 days. Modified from: BOEM (2017a).

Season	Spring				Summer				Fall				Winter			
Day	3	10	30	60	3	10	30	60	3	10	30	60	3	10	30	60
County or Parish	Conditional Probability of Contact[1] (%)															
Matagorda, Texas	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1
Vermilion, Louisiana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1
Terrebonne, Louisiana	--	--	--	--	--	--	--	1	--	--	--	--	--	--	2	2
Lafourche, Louisiana	--	--	--	--	--	--	--	--	--	--	1	1	--	--	--	1

Table 5. (Continued).

Season	Spring				Summer				Fall				Winter			
Day	3	10	30	60	3	10	30	60	3	10	30	60	3	10	30	60
County or Parish	Conditional Probability of Contact[1] (%)															
Jefferson, Louisiana	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	1
Plaquemines, Louisiana	--	2	3	3	2	9	17	19	2	17	24	24	1	12	18	20
St. Bernard, Louisiana	--	5	6	6	1	8	13	14	1	8	10	10	1	5	8	8
Hancock, Mississippi	--	2	3	3	--	2	2	2	1	2	3	3	--	1	2	3
Harrison, Mississippi	2	5	5	5	1	4	5	5	1	2	3	3	2	3	4	4
Jackson, Mississippi	7	13	14	14	3	6	8	8	6	11	12	13	6	10	12	13
Mobile, Alabama	13	18	19	19	4	9	10	10	8	12	12	13	9	12	13	13
Baldwin, Alabama	8	15	18	18	2	8	9	9	1	2	3	3	3	6	7	7
Escambia, Florida	1	6	9	10	1	4	6	6	--	1	1	1	--	2	2	3
Okaloosa, Florida	--	1	2	2	--	1	2	2	--	--	--	--	--	--	--	--
Walton, Florida	--	--	1	1	--	1	1	1	--	--	--	1	--	--	--	--
Bay, Florida	--	2	3	3	--	1	2	3	--	--	--	--	--	--	--	1
Gulf, Florida	--	1	3	4	--	--	2	2	--	--	--	--	--	--	--	--
Franklin, Florida	--	--	1	2	--	--	1	1	--	--	--	--	--	--	--	--
Dixie, Florida	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--
Levy, Florida	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--
State Coastline	Conditional Probability of Contact[1] (%)															
Texas	--	--	--	--	--	--	--	1	--	--	1	2	--	--	--	2
Louisiana	--	6	8	9	3	17	30	35	3	25	36	36	2	18	29	33
Mississippi	9	20	22	22	5	12	15	15	8	15	18	19	8	15	18	20
Alabama	21	33	37	37	6	17	20	20	9	14	15	15	12	18	20	20
Florida	1	11	19	26	1	7	14	16	--	1	3	3	--	2	4	5

[1] Conditional probability refers to the probability of contact within the stated time period assuming that a spill has occurred (-- indicates <0.5%).

From Launch Point 2, potential shoreline contacts within 60 days range from Matagorda County, Texas, to Levy County, Florida. Based on statewide contact probabilities within 60 days, Louisiana has the highest likelihood of contact during summer, fall, and winter (ranging from 33% to 36% within 60 days), while Alabama has the highest probability of contact in spring (37% within 60 days). The model predicts potential contact with Mississippi shorelines in any season ranging from a 15% probability in summer to a 22% probability in spring (within 60 days of a spill). Texas shorelines are predicted to be potentially contacted only during summer, fall, or winter, with probabilities of contact 2% or less within 60 days. Florida shorelines are predicted to be potentially contacted during any season, with a probability up to 26% in spring. Based on the 60-day trajectories, counties or parishes with 10% or higher contact probability during any season include Plaquemines and St. Bernard Parishes in Louisiana, Jackson County in Mississippi, Mobile and Baldwin counties in Alabama, and Escambia County in Florida (**Table 5**).

OSRA is a preliminary risk assessment model. In the event of an actual spill, real-time monitoring and trajectory modeling would be conducted using current and wind data available from the rigs and permanent production structures in the area. Satellite and aerial monitoring of the slick and real-time trajectory modeling using wind and current data would continue on a daily basis to help position equipment and human resources throughout the duration of any uncontrolled release.

Weathering. The constituents of diesel fuel are light to intermediate in molecular weight and can be readily degraded by aerobic microbial oxidation. The National Oceanic and Atmospheric Administration (NOAA) has reported that diesel fuel is readily and completely degraded by naturally occurring microbes (NOAA, 2006).

Weathering decreases the concentration of diesel fuel and produces changes in its chemical composition, physical properties, and toxicity. The more toxic, light aromatic and aliphatic hydrocarbons are lost rapidly by evaporation and dissolution from the slick on the water surface. Evaporated hydrocarbons are degraded rapidly by sunlight. Biodegradation of diesel fuel on the water surface and in the water column by marine bacteria removes first the n-alkanes and then the light aromatics. Other petroleum components are biodegraded more slowly (National Research Council, 2003a). Diesel fuel spill response-related activities for facilities included in this DOCD are governed by BP's Regional OSRP, which meets the requirements contained in 30 CFR 254.

Spill Response. All proposed activities and facilities in this DOCD will be covered by the Gulf of Mexico Regional OSRP submitted to BSEE by BP Exploration & Production Inc. (Operator No. 02481) on 16 April 2018 and approved on 17 May 2018.

BP's OSRP includes information about enhanced measures for responding to a spill in open water, near shore spill response, and shoreline spill response based on lessons learned from the *Deepwater Horizon* oil spill. In compliance with the requirements of 30 CFR Part 254 and related NTLs, BP's OSRP includes the following:

- A description of the measures and equipment necessary to maximize the effectiveness and efficiency of the response equipment used to recover the discharge on the water's surface. The description will include methods to increase encounter rates, the use of vessel tracking, and the use of remote sensing technologies;
- Information on remote sensing technology and equipment to be used to track oil slicks, including oil spill detection systems and remote thickness detection systems (such as X-band/infrared systems);
- Information pertaining to the use of vessel tracking systems and communication systems between response vessels and spotter personnel; and
- A shoreline protection strategy that is consistent with applicable area contingency plans.

BP is a member of the Marine Spill Response Corporation, Clean Gulf Associates, and a client of the National Response Corporation. BP would utilize oil spill response organization personnel and equipment in the event of an oil spill in the Gulf of Mexico. Primary response equipment for the activation of BP's OSRP is located in Galveston and Corpus Christi in Texas; Houma, Lake Charles, Ft. Jackson, and Venice in Louisiana; Pascagoula in Mississippi; Mobile in Alabama; and Pensacola in Florida. The preplanned staging area for this DOCD is Port Fourchon, Louisiana. Oil Spill Information is provided in Section 9 of the DOCD.

B. Affected Environment

The project area is in the central Gulf of Mexico, 64 statute miles (103 km) from the nearest shoreline (Plaquemines Parish, Louisiana), 125 statute miles (201 km) from the onshore support base at Port Fourchon, Louisiana, and 168 statute miles (269 km) from the helicopter base at Houma, Louisiana (**Figure 1**). The water depth at the location of the proposed activities is approximately 1,962 m (6,436 ft).

The seafloor in the vicinity of the proposed activities is hummocky due to a sediment drape covering the margin of a shallow-buried mass transport deposit. The seafloor gradient is approximately 1.3 degrees to the east-southeast. The closest existing infrastructure to project area is an infield oil flowline approximately 23 m (80 ft) to the northwest, the Isabela Plem 2 approximately 27 m (90 ft) to the northwest, the Isabela flowline jumper approximately 30 m (100 ft) to the west, and the existing MC 562-1 wellhead approximately 58 m (190 ft) to the northwest (BP, 2018). Based on the assessment of three-dimensional seismic seabed amplitudes and the findings from the geologic and archaeological assessment of deep-tow side scan sonar and sub-bottom profiler data, no geophysical evidence, hard bottoms or active hydrocarbon seeps were identified that could indicate the presence of high density chemosynthetic communities in the project area (BP, 2018).

A detailed description of the regional affected environment, including meteorology, oceanography, geology, air and water quality, benthic communities, threatened and endangered species, biologically sensitive resources, archaeological resources, socioeconomic conditions, and other marine uses is provided in (BOEM, 2012a, 2013, 2014, 2015, 2016b, 2017a, b). These regional descriptions remain valid and are incorporated by reference. General background information is presented in the following sections, and brief descriptions of each potentially affected resource, including site-specific and new information if available, are presented in **Section C**.

C. Impact Analysis

This section analyzes the potential direct and indirect impacts of routine activities and accidents. Impacts have been analyzed extensively in lease sale EISs for the Central and Western Gulf of Mexico Planning Areas (BOEM, 2013, 2014, 2015, 2016a, b, 2017a, b). The information in these documents is incorporated by reference in the EIA. Potential site-specific issues are addressed in this section, which is organized by the environmental resources identified in **Table 2** and addresses each potential IPF.

C.1 Physical/Chemical Environment

C.1.1 Air Quality

There are no site-specific air quality data for the project area due to the distance from shore. Because of the distance from shore-based pollution sources and the lack of sources offshore, air quality at the project area is expected to be good. The attainment status of federal OCS waters

is unclassified because there is no provision in the Clean Air Act for classification of areas outside state waters (BOEM, 2012a).

In general, ambient air quality of coastal counties along the Gulf of Mexico is relatively good (BOEM, 2012a). As of June 2018, Mississippi, Alabama, and Florida Panhandle coastal counties are in attainment of the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants (USEPA, 2018). St. Bernard Parish in Louisiana is a nonattainment area for sulfur dioxide based on the 2010 standard. One coastal metropolitan area in Texas (Houston-Galveston-Brazoria) is a nonattainment area for 8-hour ozone, and one coastal metropolitan area in Florida (Tampa) is a nonattainment area for lead based on the 2008 standard and for sulfur dioxide based on the 2010 standard (USEPA, 2018).

As noted earlier, the Air Quality Emissions Report indicates that the projected emissions are below exemption levels set by the applicable regulations in 30 CFR 550.303 for all pollutants. These IPFs with potential impacts listed in **Table 2** are discussed below.

Impacts of Air Pollutant Emissions

Air pollutant emissions are the only routine IPF likely to affect air quality. Offshore air pollutant emissions result primarily from existing platform operations, the construction/installation activity and associated service vessels and helicopters. These emissions occur mainly from combustion or burning of diesel and Jet-A aircraft fuel. The combustion of fuels occurs primarily in generators, pumps, or motors and from lighter fuel motors. Primary air pollutants typically associated with OCS activities are suspended PM, SO_x, NO_x, VOCs, and CO. As noted by BOEM (2017b), emissions from routine activities are projected to have minimal impacts to onshore air quality because of the prevailing atmospheric conditions, anticipated emission rates, anticipated heights of emission sources, and the distance to shore of the proposed activities. The incremental contribution to cumulative impacts from activities similar to BP's proposed activities is not significant and is not expected to cause or contribute to a violation of NAAQS. Given the levels of expected emissions and the distance of the project from shore, emissions from the activities described in BP's proposed DOCD are not likely to contribute to violations of any NAAQS onshore.

Greenhouse gas emissions may contribute to climate change, with important effects on temperature, rainfall, frequency of severe weather, ocean acidification, and sea level rise (Intergovernmental Panel on Climate Change, 2014). Greenhouse gas emissions from this proposed project represent a negligible contribution to the total greenhouse gas emissions from reasonably foreseeable activities in the Gulf of Mexico area and are not expected to significantly alter or exceed any of the climate change impacts evaluated in the Programmatic EIS (BOEM, 2016a). Carbon dioxide (CO_2) and methane (CH_4) emissions from the project would constitute a small incremental contribution to greenhouse gas emissions from all OCS activities. According to Programmatic and OCS lease sale EISs (BOEM, 2016a, 2017a), estimated CO_2 emissions from OCS oil and gas sources are 0.4% of the U.S. total. Because of the distance from shore, routine operations in the project area are not expected to have any impact on air quality conditions along the coast, including nonattainment areas.

As noted in the lease sale EIS (BOEM, 2017a, b), emissions of air pollutants from routine activities in the Central Gulf of Mexico Planning Area are projected to have minimal impacts to onshore air quality because of the prevailing atmospheric conditions, emission heights, emission rates, and the distance of these emissions from the coastline. The Air Quality Emissions Report

indicates that the proposed project emissions are below exemption levels set by the applicable regulations in 30 CFR 550.303. Based on this and the distance from shore, it can be concluded that the emissions will not significantly affect the air quality of the onshore area for any of the criteria pollutants.

The Breton Wilderness Area, which is part of the Breton National Wildlife Refuge (NWR), is designated under the Clean Air Act as a Prevention of Significant Deterioration Class I air quality area. BOEM is required to notify the National Park Service and U.S. Fish and Wildlife Service (USFWS) if emissions from proposed projects may affect the Breton Class I area. Additional review and mitigation measures may be required for sources within 186 statute miles (300 km) of the Breton Class I area that exceed emission limits agreed upon by the administering agencies (National Park Service, 2010). The project area is approximately 87 statute miles (140 km)[1] from the Breton Wilderness Area. BP intends to comply with all BOEM requirements regarding air emissions.

Impacts of a Small Fuel Spill

Potential impacts of a small spill on air quality are expected to be consistent with those analyzed and discussed by (BOEM, 2012a, 2015, 2016b, 2017a, b). The probability of a small spill would be minimized by BP's preventative measures during routine operations, including fuel transfer. In the unlikely event of a spill, implementation of BP's OSRP is expected to reduce the potential impacts. Oil Spill Information is provided in Section 9 of the DOCD. Given the open ocean location of the project area, the extent and duration of air quality impacts from a small spill would not be significant.

A small fuel spill would affect air quality near the spill site by introducing VOCs into the atmosphere through evaporation. The ADIOS2 model (see **Section A.9.1**) indicates that over 90% of a small diesel spill is expected to be evaporated or dispersed naturally within 24 hours. The area of the sea surface with diesel fuel on it would range from 0.5 to 5 ha (1.2 to 12 ac), depending on sea state and weather conditions.

A small fuel spill should not affect coastal air quality because the spill would not be expected to make landfall or reach coastal waters prior to breaking up (see **Section A.9.1**.

Impacts of a Large Hydrocarbon Spill

Potential impacts of a large spill on air quality are expected to be consistent with those analyzed and discussed by (BOEM, 2012a, 2015, 2016b, 2017a, b).

A large hydrocarbon spill could potentially affect air quality by introducing VOCs into the atmosphere through evaporation from the slick. The extent and persistence of impacts would depend on the meteorological and oceanographic conditions at the time and the effectiveness of spill response measures. Real-time wind and current data from the project area would be available at the time of a spill and would be used to assess the fate and effects of released VOCs.

Because of the project area's location (64 statute miles [101 km]) from the nearest shoreline, most air quality impacts would occur in offshore waters with minimal chance to affect onshore air quality.

[1] Distance calculated based on the nearest point of block MC 562 to the Breton Wilderness Area.

C.1.2 Water Quality

There are no site-specific baseline water quality data for the project area. Due to the location of the proposed activities in deep, offshore waters, water quality is expected to be good, with low levels of contaminants. Deepwater areas in the northern Gulf of Mexico are relatively homogeneous with respect to temperature, salinity, and oxygen (BOEM, 2017a). Kennicutt (2000) noted that the deepwater region has little evidence of contaminants in the dissolved or particulate phases of the water column. Within the northern Gulf of Mexico, there are localized areas (termed natural seeps) that release natural seepage of oil, gas, and brines from sub-surface deposits into near surface sediments and up through the water column. No natural seeps were noted within 610 m (2,000 ft) of the project area (BP, 2018).

IPFs that may affect water quality are effluent discharges associated with routine operations and two types of accidents (a small fuel spill and a large hydrocarbon spill) as discussed below.

Impacts of Effluent Discharges

Treated sanitary and domestic wastes, including those from support vessels, may have a transient effect on water quality in the immediate vicinity of the discharge. Treated sanitary and domestic wastes may have elevated levels of nutrients, organic matter, and chlorine but should dilute rapidly to undetectable levels within tens to hundreds of meters from the source. All NPDES permit limitations and/or MARPOL requirements as well as USCG regulations (as applicable) are expected to be met during proposed activities; therefore, little or no impact on water quality from the overboard releases of treated sanitary and domestic wastes is anticipated.

Deck drainage includes all effluents resulting from rain, deck washings, and runoff from gutters and drains (including drip pans) in work areas. Rainwater that falls on uncontaminated areas of the DP construction vessel will flow overboard without treatment. However, rainwater that falls on areas such as chemical storage areas and places where equipment is exposed will be collected, and oil and water will be separated to meet NPDES permit and or MARPOL requirements. Based on expected adherence to permit limits and applicable regulations, little or no impact on water quality from deck drainage is anticipated.

Other discharges in accordance with the NPDES permit, such as desalination unit brine; uncontaminated cooling water, firewater, ballast water, bilge water, commissioning discharges and other discharges of seawater and freshwater to which treatment chemicals have been added are expected to dilute rapidly and have little or no impact on water quality.

Support vessels will discharge treated sanitary and domestic wastes. These are not expected to have a significant impact on water quality in the vicinity of the discharges. Support vessel discharges are expected be in accordance with USCG and MARPOL 73/78 regulations and, as applicable, the NPDES Vessel General Permit, and therefore are not expected to cause significant impacts on water quality.

Impacts of a Small Fuel Spill

Potential impacts of a small spill on water quality are expected to be consistent with those analyzed and discussed by BOEM (2012a, 2015, 2016b, 2017a, b). The probability of a small spill would be minimized by BP's preventative measures during routine operations, including fuel

transfer. In the unlikely event of a spill, implementation of BP's OSRP is expected to potentially help mitigate and reduce the impacts. Oil spill information is provided in Section 9 of the DOCD.

The water-soluble fractions of diesel are dominated by two- and three-ringed PAHs, which are moderately volatile (National Research Council, 2003a). The molecular weights of diesel oil constituents are light to intermediate and can be readily degraded by aerobic microbial oxidation. Diesel oil is much lighter than water (specific gravity is between 0.83 and 0.88, compared to 1.03 for seawater). When spilled on water, diesel oil spreads very quickly to a thin film of rainbow and silver sheens, except for marine diesel, which may form a thicker film of dull or dark colors. However, because diesel oil has a very low viscosity, it is readily dispersed into the water column when winds reach 5 to 7 knots or with breaking waves (NOAA, 2017a). It is possible for the diesel oil that is dispersed by wave action to form droplets that are small enough be kept in suspension and moved by the currents.

Diesel dispersed in the water column can adhere to suspended sediments but this generally occurs only in coastal areas with high suspended solid loads (National Research Council, 2003a) and would not be expected to occur to any appreciable degree in offshore waters of the Gulf of Mexico.

The extent and persistence of water quality impacts from a small diesel fuel spill would depend on the meteorological and oceanographic conditions at the time and the effectiveness of spill response measures. It is estimated that more than 90% of a small diesel spill is expected to be evaporated or dispersed within 24 hours (see **Section A.9.1**). The sea surface area covered with a very thin layer of diesel fuel would range from 0.5 to 5 ha (1.2 to 12 ac), depending on sea state and weather conditions. In addition to removal by evaporation, constituents of diesel oil are readily and completely degraded by naturally occurring microbes (NOAA, 2006, 2017a). Given the open ocean location of the project area, the extent and duration of water quality impacts from a small spill would not be significant.

Impacts of a Large Hydrocarbon Spill

Potential impacts of a large hydrocarbon spill on water quality are expected to be consistent with those analyzed and discussed by BOEM (2012a, 2015, 2016b, 2017a, b).

Most of the spilled diesel fuel would be expected to form a slick at the surface. Dispersants are not expected to be applied due to the rapid evaporation and dispersion of diesel fuel in seawater.

The extent and persistence of impacts would depend on the meteorological and oceanographic conditions at the time and the effectiveness of spill response measures. Real-time wind and current data from the project area would be available at the time of a spill and would be used to assess the fate and effects of released VOCs. Weathering processes that affect spilled oil on the sea include adsorption (sedimentation), biodegradation, dispersion, dissolution, emulsification, evaporation, and photo oxidation.

Due to the project area being located approximately 64 statute miles (103 km) from the nearest shoreline (Plaquemines Parish, Louisiana), it is expected that most water quality impacts would occur in offshore waters. The 30-day OSRA modeling (**Table 4**) indicates nearshore waters and embayments of Plaquemines Parish, Louisiana, is the coastal area with the most potential for water quality to be affected (5% probability within 10 days and 11% probability within 30 days).

Other Louisiana shorelines may be affected within 10 days (Lafourche Parish), and shorelines in Louisiana and Florida could be affected within 30 days (1 to 11% conditional probability). The 60-day OSRA model predicts potential contact of shorelines between Matagorda County, Texas, and Levy County, Florida, with a maximum conditional probability of contact of 24% in Plaquemines Parish, Louisiana (**Table 5**) (BOEM, 2017c).

C.2 Seafloor Habitats and Biota

The water depth at the location of the proposed activities is approximately 1,962 m (6,436 ft). According to BOEM (2016a), existing information for the deepwater Gulf of Mexico indicates that the seafloor is composed primarily of soft sediments; exposed hard substrate habitats and associated biological communities are rare. The site clearance letter did not note the presence of hard bottom communities or potential seepage locations within 610 m (2,000 ft) of the location of the proposed activities (BP, 2018). The IPFs with potential impacts listed in **Table 2** are discussed below.

C.2.1 Soft Bottom Benthic Communities

There are no site-specific benthic community data from the project area. However, data from the Northern Gulf of Mexico Continental Slope Habitats and Benthic Ecology Study (Wei, 2006, Rowe and Kennicutt, 2009, Wei et al., 2010, Carvalho et al., 2013) can be used to describe typical baseline benthic communities in the area. **Table 6** summarizes data collected at two stations in water depths similar to those in the proposed project area.

Table 6. Baseline benthic community data from stations near the project area in similar depths sampled during the Northern Gulf of Mexico Continental Slope Habitats and Benthic Ecology Study (Adapted from: Wei, 2006; Rowe and Kennicutt, 2009).

Station	Water Depth (meters)	Abundance		
		Meiofauna (individuals m^{-2})	Macroinfauna (individuals m^{-2})	Megafauna (individuals ha^{-1})
HiPro	1,565	343,118	5,076	--
S37	2,387	291,179	2,192	1,451

Meiofaunal and megafaunal abundances from Rowe and Kennicutt (2009); macroinfaunal abundance from Wei (2006). -- = no data available.

Densities of meiofauna (animals passing through a 0.5-mm sieve but retained on a 0.062-mm sieve) at stations in the vicinity of the project area ranged from approximately 290,000 to 340,000 individuals m^{-2} (**Table 6**) (Rowe and Kennicutt, 2009). Nematodes, nauplii, and harpacticoid copepods were the three dominant meiofaunal groups, accounting for about 90% of total abundance.

The benthic macroinfauna is characterized by small mean individual sizes and low densities, both of which reflect the meager primary production in surface waters of the Gulf of Mexico continental slope (Wei, 2006). Densities decrease exponentially with water depth. Based on an equation presented by Wei (2006), macroinfaunal densities in the water depth of the project area are expected to be approximately 1,589 individuals m^{-2}. Actual densities at the proposed project location are unknown; however, macrofaunal densities at stations in the vicinity of the proposed activities ranged from approximately 2,200 to 5,100 individuals m^{-2} (**Table 6**).

Polychaetes are typically the most abundant macroinfaunal group on the northern Gulf of Mexico continental slope, followed by amphipods, tanaids, bivalves, and isopods. Carvalho et al. (2013) found polychaete abundance to be higher in the central region of the northern Gulf of Mexico when compared to the eastern and western regions. Wei (2006) recognized four depth-dependent faunal zones (1 through 4), two of which are further subdivided. The project area is in Zone 2E, which extends from the Texas-Louisiana slope to the west Florida terrace. The most abundant species in this zone were the polychaetes *Aricidea suecica*, *Litocorsa antennata*, *Paralacydonia paradoxa*, and *Tharyx marioni*; and the bivalve *Heterodonta* spp. (Wei, 2006).

The megafaunal density from a station in the vicinity of the project area was 1,451 individuals ha^{-1}. Common megafauna included motile groups such as decapods, ophiuroids, holothurians, and demersal fishes as well as sessile groups such as sponges and anemones (Rowe and Kennicutt, 2009).

Bacteria are an important component in terms of biomass and cycling of organic carbon (Cruz-Kaegi, 1998). For example, in deep sea sediments, Main et al. (2015) observed that microbial oxygen consumption rates increased and bacterial biomass decreased with hydrocarbon contamination. Bacterial biomass at the depth range of the project area typically is about 1 to 2 g C m^{-2} in the top 15 cm of sediments (Rowe and Kennicutt, 2009).

IPFs that potentially may affect benthic communities are limited to physical disturbance of the seafloor. Small or large diesel fuel spills would not affect benthic communities because the diesel fuel is expected to float and dissipate on the sea surface.

Impacts of Physical Disturbance to the Seafloor

The areal extent of impacts to the seafloor from the installation of seafloor infrastructure will be small and limited to the footprint of the SMS and electrical flying leads. Soft bottom benthic communities are ubiquitous along the northern Gulf of Mexico continental slope (Gallaway, 1988, Gallaway et al., 2003, Rowe and Kennicutt, 2009). Impacts from the physical disturbance of the seafloor during this project are expected be localized and will not likely have a significant impact on soft bottom benthic communities in the region.

C.2.2 High-Density Deepwater Benthic Communities

As defined by NTL 2009-G40, high-density deepwater benthic communities are features or areas that could support high-density chemosynthetic communities, or features or areas that could support high-density hard bottom communities, including deepwater coral-dominated communities. Chemosynthetic communities were discovered in the central Gulf of Mexico in 1984 and have been studied extensively (MacDonald, 2002). Deepwater coral communities are also known from numerous locations in the Gulf of Mexico (Brooke and Schroeder, 2007, CSA International, 2007, Brooks et al., 2012). In the Gulf of Mexico, deepwater coral communities occur almost exclusively on exposed authigenic carbonate rock created by a biogeochemical (microbial) process.

The site clearance letter did not identify any features that could support high-density deepwater benthic communities within 610 m (2,000 ft) of the location of the proposed activities (BP, 2018). There are no IPFs for this project that could affect high-density deepwater benthic communities. Physical disturbance and effluent discharge are not considered IPFs for deepwater benthic communities because these communities are not expected to be present down current

of the location of the proposed activities. Small or large diesel fuel spills would not affect benthic communities because the diesel fuel would float and dissipate on the sea surface.

C.2.3 Designated Topographic Features

The project block is not within or near a designated topographic feature or a no-activity zone as identified in NTL 2009-G39. The nearest designated Topographic Feature Stipulation Block is located approximately 73 statute miles (117 km) west of the project area. There are no IPFs associated with routine operations that could cause impacts to designated topographic features.

Due to the distance from the project area, it is unlikely that designated topographic features could be affected by an accidental spill. A small fuel spill would float and dissipate on the surface and would not reach these seafloor features. In the event of a large diesel fuel spill from the DP construction vessel fuel tank, a surface slick would not contact these seafloor features.

C.2.4 Pinnacle Trend Area Live Bottoms

The project area is not covered by the Live Bottom (Pinnacle Trend) Stipulation. As defined by NTL 2009-G39, the nearest Pinnacle Stipulation Block is located approximately 51 statute miles (82 km) north of the project area. There are no IPFs associated with routine operations that could cause impacts to pinnacle trend area live bottoms due to the distance from the project area.

Due to the distance from the project area, it is unlikely that pinnacle trend live bottom areas would be affected by an accidental spill. A small fuel spill would float on the surface and would not reach these seafloor features. In the event of a large diesel fuel spill from DP construction vessel fuel tank, a surface slick would not contact these seafloor features.

C.2.5 Eastern Gulf Live Bottoms

The project area is not covered by the Live Bottom (Low-Relief) Stipulation, which applies to seagrass communities and low-relief hard bottom reef within the Eastern Gulf of Mexico Planning Area leases in water depths of 100 m (328 ft) or less and portions of Pensacola and Destin Dome Area blocks in the Central Gulf of Mexico Planning Area. The nearest block covered by the Live Bottom Stipulation, as defined by NTL 2009-G39, is located approximately 70 statute miles (113 km) north-northeast of the project area. There are no IPFs associated with routine operations that could cause impacts to eastern Gulf live bottom areas due to the distance from the project area.

Because of the distance from the project area, it is unlikely that Eastern Gulf live bottom areas would be affected by an accidental spill. A small fuel spill would float and dissipate on the surface and would not reach these seafloor features. In the event of a large diesel fuel spill from a DP construction vessel fuel tank, a surface slick would not contact these seafloor features.

C.3 Threatened, Endangered, and Protected Species and Critical Habitat

This section discusses species listed as endangered or threatened under the Endangered Species Act (ESA). In addition, it includes all marine mammal species in the region, which are protected under the Marine Mammal Protection Act (MMPA).

Endangered or threatened species that may occur in the project area and/or along the northern Gulf Coast are listed in **Table 7**. The table also indicates the location of critical habitat (if designated in the Gulf of Mexico). Critical habitat is defined as (1) specific areas within the geographical area occupied by the species at the time of listing, if they contain physical or biological features essential to conservation, and those features may require special management considerations or protection; and (2) specific areas outside the geographical area occupied by the species if the agency determines that the area itself is essential for conservation. The National Marine Fisheries Service (NMFS) has jurisdiction for ESA-listed marine mammals (cetaceans), sea turtles, and fishes in the Gulf of Mexico. The USFWS has jurisdiction for ESA-listed birds, the West Indian manatee, and sea turtles while on their nesting beaches.

Coastal endangered or threatened species that may occur along the northern Gulf Coast include the West Indian manatee, Piping Plover, Whooping Crane, Gulf sturgeon, and four subspecies of *Peromyscus* spp. beach mouse. Critical habitat has been designated for all of these species as indicated in **Table 7** and discussed in individual sections.

The sperm whale, five species of sea turtles, and the oceanic whitetip shark are the only endangered or threatened species likely to occur in or near the project area. The listed sea turtles include the leatherback turtle, Kemp's ridley turtle, hawksbill turtle, loggerhead turtle, and green turtle (Pritchard, 1997). Effective 11 August 2014, NMFS has designated certain marine areas as critical habitat for the Northwest Atlantic Distinct Population Segment (DPS) of the loggerhead sea turtle (see **Section C.3.4**). No critical habitat has been designated in the Gulf of Mexico for the leatherback turtle, Kemp's ridley turtle, hawksbill turtle, green turtle, the sperm whale, or the oceanic whitetip shark. Five endangered mysticetes (blue whale, fin whale, humpback whale, North Atlantic right whale, and sei whale) have been reported in the Gulf of Mexico, but are considered rare or extralimital (Würsig et al., 2000). These species are not included in the most recent NMFS stock assessment report (Waring et al., 2016, Hayes et al., 2017) nor in the most recent BOEM multisale EIS (BOEM, 2017a); therefore, they are not considered further in the EIA.

Four threatened coral species are known from the northern Gulf of Mexico: elkhorn coral (*Acropora palmata*), lobed star coral (*Orbicella annularis*), mountainous star coral (*Orbicella faveolata*), and boulder star coral (*Orbicella franksi*) (NOAA, 2017b). None of these species are expected to be present in the project area (see **Section C.3.9**).

There are no other endangered animals or plants in the Gulf of Mexico that are reasonably likely to be adversely affected by either routine or accidental events. Other species occurring at certain locations in the Gulf of Mexico such as the smalltooth sawfish (*Pristis pectinata*) and Florida salt marsh vole (*Microtus pennsylvanicus dukecampbelli*) are remote from the project area and highly unlikely to be affected. The IPFs with potential impacts listed in **Table 2** are discussed below.

Table 7. Federally listed endangered and threatened species potentially occurring in the project area and along the northern Gulf Coast.

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in Gulf of Mexico
			Project area	Coastal	
Marine Mammals					
Bryde's whale	*Balaenoptera edeni*[a]	P	X	--	None
Sperm whale	*Physeter macrocephalus*	E	X	--	None
West Indian manatee	*Trichechus manatus*[b]	T	--	X	Florida (Peninsular)
Sea Turtles					
Loggerhead turtle	*Caretta caretta*	T,E[c]	X	X	Nesting beaches and nearshore reproductive habitat in Mississippi, Alabama, and Florida; *Sargassum* habitat including most of the central and western Gulf of Mexico.
Green turtle	*Chelonia mydas*	T	X	X	None
Leatherback turtle	*Dermochelys coriacea*	E	X	X	None
Hawksbill turtle	*Eretmochelys imbricata*	E	X	X	None
Kemp's ridley turtle	*Lepidochelys kempii*	E	X	X	None
Birds					
Piping Plover	*Charadrius melodus*	T	--	X	Coastal Texas, Louisiana, Mississippi, Alabama, and Florida
Whooping Crane	*Grus americana*	E	--	X	Coastal Texas (Aransas National Wildlife Refuge)
Fishes and Sharks					
Oceanic whitetip shark	*Carcharhinus longimanus*	T	X	--	None
Gulf Sturgeon	*Acipenser oxyrinchus desotoi*	T	--	X	Coastal Louisiana, Mississippi, Alabama, and Florida
Invertebrates					
Elkhorn coral	*Acropora palmata*	T	--	X	Florida Keys and the Dry Tortugas
Lobed star coral	*Orbicella annularis*	T	--	X	None
Mountainous star coral	*Orbicella faveolata*	T	--	X	None
Boulder star coral	*Orbicella franksi*	T	--	X	None
Terrestrial Mammals					
Beach mice (Alabama, Choctawhatchee, Perdido Key, St. Andrew)	*Peromyscus polionotus*	E	--	X	Alabama and Florida (Panhandle) beaches

E = endangered; P = Proposed; T = threatened; X = potentially present; -- = not present.

[a] Gulf of Mexico Bryde's whales are protected by the Marine Mammal Protection Act. There is currently a proposed rule to list this stock as 'endangered' under the Endangered Species Act.

[b] There are two subspecies of West Indian manatee: the Florida manatee (*T. m. latirostris*), which ranges from the northern Gulf of Mexico to Virginia, and the Antillean manatee (*T. m. manatus*), which ranges from northern Mexico to eastern Brazil. Only the Florida manatee subspecies is likely to be found in the northern Gulf of Mexico. On 30 March 2017, the USFWS announced the West Indian manatee, including the Florida manatee subspecies, was reclassified as threatened.

[c] The loggerhead turtle is composed of nine distinct population segments (DPS). The only DPS that may occur in the project area (Northwest Atlantic DPS) is listed as threatened (76 *Federal Register* [FR] 58868; 22 September 2011).

C.3.1 Sperm Whale (Endangered)

The only endangered marine mammal likely to be present at or near the project area is the sperm whale (*Physeter macrocephalus*). Resident populations of sperm whales occur within the Gulf of Mexico; a species description is presented in the recovery plan for this species (NMFS, 2010). Gulf of Mexico sperm whales are classified as an endangered species and a strategic stock (defined as a stock that may have unsustainable human-caused impacts) by NOAA Fisheries (Waring et al., 2016). A strategic stock is defined by the MMPA as a marine mammal stock that meets the following criteria:

- The level of direct human-caused mortality exceeds the potential biological removal level;
- Based on the best available scientific information, is in decline and is likely to be listed as a threatened species under the ESA within the foreseeable future; or
- Listed as a threatened or endangered species under the ESA, or is designated as depleted under the MMPA.

Current threats to sperm whale populations worldwide are discussed in a final recovery plan for the sperm whale recently published by NMFS (2010). Threats are defined as "any factor that could represent an impediment to recovery," and include fisheries interactions, anthropogenic marine sound, vessel interactions, contaminants and pollutants, disease, injury from marine debris, research, predation and natural mortality, direct harvest, competition for resources, loss of prey base due to climate change and ecosystem change, and cable laying. In the Gulf of Mexico, the impacts from many of these threats are identified as either low or unknown (BOEM, 2012a).

In 2013, NMFS conducted a status review to consider designating the Gulf of Mexico population of the sperm whale as a DPS under the ESA, but concluded that the designation of a Gulf of Mexico DPS for sperm whales was not warranted (78 FR 68032).

The distribution of sperm whales in the Gulf of Mexico is correlated with mesoscale physical features such as eddies associated with the Loop Current (Jochens et al., 2008). Sperm whale populations in the north-central Gulf of Mexico are present throughout the year (Davis et al., 2000a). Results of a multi-year tracking study show female sperm whales are typically concentrated along the upper continental slope between the 200- and 1,000-m (656 and 3,280 ft) depth contours (Jochens et al., 2008). Male sperm whales were more variable in their movements and were documented in water depths greater than 3,000 m (9,843 ft). Generally, groups of sperm whales sighted in the Gulf of Mexico during the MMS-funded Sperm Whale Seismic Study of mixed-sex groups comprising adult females with juveniles, and groups of bachelor males. Typical group size for mixed groups was 10 individuals (Jochens et al., 2008).

A review of sighting reports from seismic mitigation surveys in the Gulf of Mexico conducted over a 6-year period found a mean group size for sperm whales of 2.5 individuals (Barkaszi et al., 2012). In these mitigation surveys, sperm whales were the most common large cetacean encountered. The Sperm Whale Seismic Study results also showed that sperm whales transit through the vicinity of the project area. Movements of satellite-tracked individuals suggest that this area of the continental slope is within the home range of the Gulf of Mexico population (within the 95% utilization distribution) (Jochens et al., 2008).

IPFs that may potentially affect sperm whales include DP construction vessel presence, marine sound, and lights; support vessel and helicopter marine sound; support vessel strikes; and two types of accidents (a small fuel spill and a large hydrocarbon spill). Effluent discharges are likely to have negligible impacts on sperm whales due to rapid dilution, the small area of ocean affected, the intermittent nature of the discharges, and the mobility of these marine mammals. Compliance with NTL BSEE-2015-G03 is expected to minimize the potential for marine debris-related impacts on sperm whales.

Impacts of DP Construction Vessel Presence, Marine Sound, and Lights

Noise from installation activities has the potential to disturb individuals or groups of sperm whales or mask the sounds they would normally produce or hear. Behavioral responses to noise by marine mammals vary widely and overall, are short-term and include, temporary displacement or cessation of feeding, resting, or social interactions (NMFS, 2009a, Gomez et al., 2016). Additionally, behavioral changes resulting from auditory masking sounds may induce an animal to produce more calls, longer calls, or shift the frequency of the calls. For example, masking caused by vessel noise was found to result in a reduced number of whale calls in the Gulf of Mexico (Azzara et al., 2013).

NMFS (2016) lists sperm whales in the same hearing group (i.e., mid-frequency cetaceans) as dolphins, toothed whales, beaked whales, and bottlenose whales (estimated hearing range from 150 Hz to 160 kHz). Sperm whale sounds generally consist of clicks that have a bandwidth of 100 Hz to 30 kHz (Erbe et al., 2017). Acoustic energy peaks at around 15 kHz, and is generally concentrated below 10 kHz, although diffuse energy up to and past 20 kHz is common (Weilgart and Whitehead, 1993, Goold and Jones, 1995, Møhl et al., 2003, Erbe et al., 2017). Source levels of clicks are generally 186 ± 0.9 dB re 1 μPa_{rms} m with extremes up to 236 dB re 1 μPa_{rms} m (rms = route means squared) (Møhl et al., 2003, Mathias et al., 2013). Noise produced by DP thrusters, and installation operations are all classified as non-impulsive sound sources and are within the hearing frequency sensitivity of sperm whales. As discussed in **Section A.1**, noise from offshore operations can produce broadband (10Hz to 10kHz) sound pressure levels of approximately 190 dB re 1 µPa m (Hildebrand, 2005). Therefore, vessel-related noise is likely to be heard by sperm whales.

Animals can determine the direction from which a sound arrives based on cues, such as differences in arrival times, sound levels, and phases at the two ears. Thus, an animal's directional hearing capabilities have a bearing on its vulnerability to masking (National Research Council, 2003b). It is expected that, due to the relatively stationary nature of the proposed activities, sperm whales would move away from the proposed operations area, and noise levels that could cause auditory injury would be avoided. However, observations of sperm whales near offshore oil and gas operations suggest an inconsistent response to anthropogenic marine sound (Jochens et al., 2008).

There are other OCS facilities and activities near the project area, and the region as a whole has a large number of similar marine sound sources. Subsea infrastructure installation-related marine sound associated with this project will contribute to increases in the ambient marine sound environment of the Gulf of Mexico, but it is not expected in amplitudes sufficient to result in auditory injuries to sperm whales. The proposed activity may cause disturbance effects, primarily avoidance or temporary displacement from the project area. Vessel lighting and presence are not identified as IPFs for sperm whales (NMFS, 2007, BOEM, 2016a, 2017a, b).

Impacts of Support Vessel and Helicopter Traffic

Support vessel traffic has the potential to disturb sperm whales, and there is also a risk of vessel strikes, which are identified as a threat in the recovery plan for this species (NMFS, 2010). To reduce the potential for vessel strikes, BOEM issued BOEM-2016-G01. This NTL recommends that vessel operators and crews receive protected species identification training. Vessel operators are required to maintain a vigilant watch for and report sightings of any injured or dead protected species. When whales are sighted, vessel operators and crews are required to attempt to maintain a distance of 91 m (300 ft) or greater from the sighted animal whenever possible. Vessel operators are required to reduce vessel speed to 10 knots or less, if safety permits, when mother/calf pairs, pods, or large assemblages of cetaceans are observed near an underway vessel. Compliance with this NTL is expected to minimize the likelihood of vessel strikes as well as reduce the chance for disturbing sperm whales.

NMFS (2007) analyzed the potential for vessel strikes and harassment of sperm whales. With implementation of the mitigation measures in NTL BOEM-2016-G01, NMFS concluded that the observed avoidance of passing vessels by sperm whales is an advantageous response to avoid a potential threat and is not expected to result in any significant effect on migration, breathing, nursing, breeding, feeding, or sheltering to individuals, or have any consequences at the population level. With implementation of the vessel strike avoidance measures requirement to maintain a distance of 91 m (300 ft) from sperm whales, the NMFS concluded that the potential for harassment of sperm whales would be reduced to insignificant levels.

Support helicopter traffic also has the potential to disturb sperm whales. Smultea et al. (2008) documented responses of sperm whales offshore Hawaii to fixed wing aircraft flying at an altitude of 245 m (800 ft). A reaction to the initial pass of the aircraft was observed during 3 of 24 sightings (12%). All three reactions consisted of a hasty dive and occurred at less than 360 m (1,180 ft) lateral distance from the aircraft. Additional reactions were seen when aircraft circled certain whales to make further observations. Based on other studies of cetacean responses to sound, Smultea et al. (2008) concluded that the observed reactions to brief overflights by the aircraft were short-term and limited to behavioral disturbances.

While flying offshore in the Gulf of Mexico, support helicopters maintain altitudes above 213 m (700 ft) during transit to and from the working area. In the event that a whale is seen during transit, the helicopter will not approach or circle the animals. Although responses are possible (Smultea et al., 2008), NMFS (2007) concluded that this helicopter flight altitude would minimize the potential for disturbing sperm whales.

Impacts of a Small Fuel Spill

Potential spill impacts on marine mammals, including sperm whales, are discussed by NMFS (2007) and BOEM (2017a, b). Oil impacts on marine mammals are discussed by Geraci and St. Aubin (1990) and by the MMC (2011) with discussions germane to the Gulf of Mexico populations concerning composition and fate of petroleum and spill-treating agents in the marine environment, aspects of cetacean ecology, and physiological and toxic effects of oil on cetaceans. For this DOCD, there are no unique site-specific issues with respect to spill impacts on these animals that were not analyzed in the previous documents.

A small fuel spill in offshore waters would produce a thin sheen on the water surface and introduce concentrations of petroleum hydrocarbons and their degradation products. The extent and persistence of impacts would depend on the meteorological and oceanographic

conditions at the time and the effectiveness of spill response measures. **Section A.9.1** discusses the likely fate of a small fuel spill and estimates that over 90% is expected to be evaporated or dispersed naturally within 24 hours. The area of the sea surface with diesel fuel on it would range from 0.5 to 5 ha (1.2 to 12 ac), depending on sea state and weather conditions.

Direct physical and physiological effects of exposure to diesel fuel could include skin irritation, inflammation, or necrosis; chemical burns of skin, eyes, and mucous membranes; inhalation of toxic fumes; ingestion of oil directly or via contaminated prey; and stress from the activities and marine sound of response vessels and aircraft (MMC, 2011). However, due to the limited areal extent and short duration of water quality impacts from a small fuel spill as well as the mobility of sperm whales, no significant impacts would be expected.

Impacts of a Large Hydrocarbon Spill

Potential spill impacts on marine mammals, including sperm whales, are discussed by NMFS (2007) and BOEM (2017a, b). Oil impacts on marine mammals are discussed by Geraci and St. Aubin (1990) and by the MMC (2011). For this DOCD, there are no unique site-specific issues with respect to spill impacts on sperm whales.

Impacts of spills on sperm whales can include direct impacts from oil exposure as well as indirect impacts due to response activities and materials (e.g., vessel traffic, marine sound) (MMC, 2011). Direct physical and physiological effects can include skin irritation, inflammation, or necrosis; chemical burns of skin, eyes, and mucous membranes; inhalation of toxic fumes; ingestion of hydrocarbons directly or via contaminated prey; and stress from the activities and marine sound of response vessels and aircraft. The level of impact depends on the amount, frequency, and duration of exposure; route of exposure; and type or condition of petroleum compounds (Hayes et al., 2017). Complications of the above may lead to dysfunction of immune and reproductive systems, physiological stress, declining physical condition, and death. Behavioral responses can include displacement of animals, including displacement from prime habitat, disruption of social structure, changing prey availability and foraging distribution and/or patterns, changing reproductive behavior/productivity, and changing movement patterns or migration (MMC, 2011).

In the event of a large spill, the level of vessel and aircraft activity associated with spill response could disturb sperm whales and potentially result in vessel strikes, entanglement, or other injury or stress. Response vessels would operate in accordance with NTL BOEM-2016-G01 to reduce the potential for striking or disturbing sperm whales.

C.3.2 West Indian Manatee (Threatened)

Most of the Gulf of Mexico manatee (*Trichechus manatus*) population is located in peninsular Florida, but manatees have been seen as far west as Texas during the summer (U.S. Fish and Wildlife Service, 2001). Critical habitat has been designated in southwest Florida. Manatee sightings in Louisiana have increased as the species extends its presence farther west of Florida in the warmer months (Hieb et al., 2017). Manatees are typically found in coastal and riverine habitats, but have rarely been seen in deepwater areas, usually in colder months when they seek refuge from colder coastal waters (U.S. Fish and Wildlife Service, 2001, Fertl et al., 2005). A species description is presented in the West Indian manatee recovery plan (U.S. Fish and Wildlife Service, 2001).

IPFs that potentially may affect manatees include support vessel and helicopter traffic and a large hydrocarbon spill. A small fuel spill in the project area would be unlikely to affect

manatees, as the project area is approximately 64 statute miles (103 km) from the nearest shoreline (Louisiana). As explained in **Section A.9.1**, a small fuel spill would not be expected to make landfall or reach coastal waters prior to breaking up. Compliance with BSEE-NTL 2015-G03 (see **Table 1**) is expected to minimize the potential for marine debris-related impacts on manatees.

Impacts of Support Vessel and Helicopter Traffic

Support vessel traffic has the potential to disturb manatees, and there is also a risk of vessel strikes, which are identified as a threat in the recovery plan for this species (U.S. Fish and Wildlife Service, 2001). Manatees are expected to be limited to inner shelf and coastal waters, and impacts are expected to be limited to transits of these vessels and helicopters through these waters. To reduce the potential for vessel strikes, BOEM issued NTL 2016-G01, which recommends protected species identification training for vessel operators and that vessels slow down or stop their vessel to avoid striking protected species. The NTL also requires that operators and crews maintain a vigilant watch for marine mammals and report sightings of any injured or dead protected species. Compliance with this NTL is expected to minimize the likelihood of vessel strikes, and no significant impacts on manatees are expected.

Dependent on flight altitude, helicopter traffic also has the potential to disturb manatees. Rathbun (1988) reported that manatees were disturbed more by helicopters than by fixed-wing aircraft; however, the helicopter was flown at relatively low altitudes of 20 to 160 m (66 to 525 ft). Helicopters used in support operations maintain a minimum altitude of 213 m (700 ft) while in transit offshore, 305 m (1,000 ft) over unpopulated areas or across coastlines, and 610 m (2,000 ft) over populated areas and sensitive habitats such as wildlife refuges and park properties. In addition, guidelines and regulations specify that helicopters maintain an altitude of 305 m (1,000 ft) within 91 m (300 ft) of marine mammals (BOEM, 2017a). This mitigation measure will minimize the potential for disturbing manatees, and no significant impacts are expected.

Impacts of a Large Hydrocarbon Spill

The OSRA results summarized in **Table 4** predict that Plaquemines Parish in Louisiana is the coastal area most likely to be affected (5% probability within 10 days; and 11% probability within 30 days). Lafourche Parish may be affected within 10 days, and shorelines in Louisiana and Florida could be affected within 30 days. There is no manatee critical habitat designated in these areas, and the number of manatees potentially present is a small fraction of the population residing in peninsular Florida. The 60-day OSRA modeling (**Table 5**) predicts that shorelines between Matagorda County, Texas, and Levy County, Florida, may be contacted within 60 days of a spill. This range does not include any areas of manatee critical habitat. In the event that manatees were exposed to hydrocarbons, effects could include direct impacts from hydrocarbon exposure as well as indirect impacts due to response activities and materials (e.g., vessel traffic, marine sound) (MMC, 2011). Direct physical and physiological effects can include asphyxiation, acute poisoning, lowering of tolerance to other stress, nutritional stress, and inflammation from infection (BOEM, 2017a). Indirect impacts include stress from the activities and noise of response vessels and aircraft. Complications of the above may lead to dysfunction of immune and reproductive systems, physiological stress, declining physical condition, and death. Behavioral responses can include displacement of animals from prime habitat, disruption

of social structure, changing prey foraging distribution and/or patterns, changing reproductive behavior/productivity, and changing movement patterns or migration (MMC, 2011).

In the event that a large spill reached coastal waters where manatees were present, the level of vessel and aircraft activity associated with spill response could disturb manatees and potentially result in vessel strikes, entanglement, or other injury or stress. Response vessels would be expected to operate in accordance with NTL BOEM-2016-G01 (see **Table 1**) to reduce the potential for striking or disturbing these animals, and therefore no significant impacts are expected.

C.3.3 Non-Endangered Marine Mammals (Protected)

Excluding the two endangered or threatened species that have been cited previously, there are 21 additional species of marine mammals that may be found in the Gulf of Mexico, including 1 species of mysticete whale, dwarf and pygmy sperm whales, 4 species of beaked whales, and 14 species of delphinid whales (dolphins). All marine mammals are protected species under the MMPA. The most common non-endangered cetaceans in the deepwater environment are small odontocetes such as the pantropical spotted dolphin, spinner dolphin, and bottlenose dolphin. A brief summary is presented below, and additional information on these groups is presented by BOEM (2017a).

Bryde's Whale. The Bryde's whale (*Balaenoptera edeni*) is the only year-round resident baleen whale in the northern Gulf of Mexico. In 2014, a petition was submitted to designate the northern Gulf of Mexico population as a DPS and list it as endangered under the ESA (Natural Resources Defense Council, 2014). This petition received a 90-day positive finding by NMFS in 2015 and is currently under consideration for listing. The Bryde's whale is most frequently sighted between the 100 m (328 ft) and 1,000 m (3,280 ft) isobaths (Davis and Fargion, 1996, Davis et al., 2000a, Waring et al., 2016). Most sightings and acoustic detections have been made in the DeSoto Canyon region and off western Florida, although there have been some in the west-central portion of the northeastern Gulf. Based on the available data, it is possible that Bryde's whales could occur in the project area.

Dwarf and pygmy sperm whales. At sea, it is difficult to differentiate dwarf sperm whales (*Kogia sima*) from pygmy sperm whales (*Kogia breviceps*), and sightings are often grouped together as *Kogia* spp. Both species have a worldwide distribution in temperate to tropical waters. In the Gulf of Mexico, both species occur primarily along the continental shelf edge and in deeper waters off the continental shelf (Mullin et al., 1991, Mullin, 2007, Waring et al., 2016). Either species could occur in the project area.

Beaked whales. Four species of beaked whales are known to occur in the Gulf of Mexico: Blainville's beaked whale (*Mesoplodon densirostris*), Sowerby's beaked whale (*Mesoplodon bidens*), Gervais' beaked whale (*Mesoplodon europaeus*), and Cuvier's beaked whale (*Ziphius cavirostris*). Stranding records (Würsig et al., 2000) as well as passive acoustic monitoring in the Gulf of Mexico (Hildebrand et al., 2015) suggest that Gervais' beaked whale and Cuvier's beaked whale are the most common species in the region. The Sowerby's beaked whale is considered extralimital, with only one document stranding in the Gulf of Mexico (Bonde and O'Shea, 1989). Blainville's beaked whales are rare, with only four documented strandings in the northern Gulf of Mexico (Würsig et al., 2000).

Due to the difficulties of at sea identification, beaked whales in the Gulf of Mexico are identified either as Cuvier's beaked whales or are grouped into an undifferentiated species complex (*Mesoplodon* spp.). In the northern Gulf of Mexico, they are broadly distributed in water depths greater than 1,000 m (3,281 ft) over lower slope and abyssal landscapes (Davis et al., 2000a). Any of these species could occur in the project area (Waring et al., 2016).

Delphinids. Fourteen species of delphinids are known from the Gulf of Mexico, including Atlantic spotted dolphin (*Stenella frontalis*), bottlenose dolphin (*Tursiops truncatus*), Clymene dolphin (*Stenella clymene*), false killer whale (*Pseudorca crassidens*), Fraser's dolphin (*Lagenodelphis hosei*), killer whale (*Orcinus orca*), melon-headed whale (*Peponocephala electra*), pantropical spotted dolphin (*Stenella attenuata*), pygmy killer whale (*Feresa attenuata*), short-finned pilot whale (*Globicephala macrorhynchus*), Risso's dolphin (*Grampus griseus*), rough-toothed dolphin (*Steno bredanensis*), spinner dolphin (*Stenella longirostris*), and striped dolphin (*Stenella coeruleoalba*). Any of these species could occur in the project area (Waring et al., 2016).

The bottlenose dolphin is a common inhabitant of the northern Gulf of Mexico, particularly within continental shelf waters. There are two ecotypes of bottlenose dolphins, a coastal form and an offshore form, which are genetically isolated from each other (Waring et al., 2016). The offshore form of the bottlenose dolphin may occur within the project area. Inshore populations of coastal bottlenose dolphins in the northern Gulf of Mexico are separated into 31 geographically distinct population units, or stocks, for management purposes by NMFS (Hayes et al., 2017).

IPFs that potentially may affect non-endangered marine mammals include DP construction vessel presence, marine sound, and lights; support vessel and helicopter traffic; and two types of accidents (a small fuel spill and a large hydrocarbon spill). Effluent discharges are likely to have negligible impacts on marine mammals due to rapid dispersion, the small area of ocean affected, the intermittent nature of the discharges, and the mobility of marine mammals. Compliance with NTL BSEE-2015-G03 is expected to minimize the potential for marine debris-related impacts on marine mammals.

Impacts of DP Construction Vessel Presence, Marine Sound, and Lights

The presence of the DP construction vessel presents an attraction to pelagic food sources that may attract cetaceans. Some odontocetes have shown increased feeding activity around lighted platforms at night (Todd et al., 2009). Therefore, prey congregation could pose an attraction to protected species that exposes them to higher levels or longer durations of noise that might otherwise be avoided. Vessel presence and lighting are not considered as IPFs for marine mammals (BOEM, 2017a).

Noise from installation operations has the potential to disturb marine mammals. As discussed in **Section A.1,** noise impacts would be expected at greater distances when DP thrusters are in use than with vessel and installation noise alone and are dependent on variables relating to sea state conditions, thruster type and usage. Three functional hearing groups are represented in the 21 non-endangered cetaceans found in the Gulf of Mexico. Eighteen of the 20 odontocete species are considered to be in the mid-frequency functional hearing group, two congeners (*Kogia* spp.) are in the high frequency functional hearing group, and one species (Bryde's whale) is in the low frequency functional hearing group (NMFS, 2016). Thruster and installation noise

will affect each group differently depending on the frequency bandwidths produced by operations. Generally, noise produced by vessels on DP is dominated by frequencies below 10 kHz. Thus, DP sound sources are out of range for the high frequency group whereas the low frequency group is more likely to be disturbed by the low frequency output of the sound sources.

For mid frequency cetaceans exposed to a non-impulsive source (like installation operations), permanent threshold shifts are estimated to occur when the mammal has received a cumulative exposure level of 198 dB re 1 $\mu Pa^2 \cdot s$ (decibels relative to 1 micropascal squared × seconds) over a 24-hour period. Similarly, temporary threshold shifts are estimated to occur when a mammal has received a cumulative noise exposure level of 178 dB re 1 $\mu Pa^2 \cdot s$ over a 24-hour period. For low frequency cetaceans, specifically the Bryde's whale, permanent and temporary threshold shift onset is estimated to occur at 199 dB re 1 $\mu Pa^2 \cdot s$ and 179 re 1 $\mu Pa^2 \cdot s$, respectively. Based on transmission loss calculations (see Urick, 1983), open water propagation of noise produced by typical sources with DP thrusters is not expected to produce received levels greater than 160 dB re 1 µPa beyond 32 m (105 ft) from the source. Due to the short propagation distance of high sound pressure levels, the transient nature of marine mammals and the stationary nature of installation activities, it is not expected that any marine mammals will receive exposure levels necessary for the onset of auditory threshold shifts.

There are other OCS facilities and activities near the project area, and the region as a whole has a large number of similar sources. Marine mammal species in the northern Gulf of Mexico have been exposed to noise from anthropogenic sources for a long period of time and over large geographic areas and likely do not represent a naïve population with regard to sound (National Research Council, 2003b). It is expected that this project would represent a small, temporary contribution to the overall noise regime, and any short-term behavioral impacts are not expected to be biologically significant to marine mammal populations.

NOAA Fisheries West Coast Region (2018) presents criteria that are used in the interim to determine behavioral disturbance thresholds for marine mammals and are applied equally across all functional hearing groups. Received sound pressure levels of 120 dB re 1 µPa from a non-impulsive source are considered high enough to elicit a behavioral reaction in some marine mammal species. The 120 dB isopleth may extend tens to hundreds of kilometers from the source depending on the propagation environment.

Impacts of Support Vessel and Helicopter Traffic

Support vessel traffic has the potential to disturb marine mammals, and there is also a risk of vessel strikes. Data concerning the frequency of vessel strikes are presented by BOEM (2012a). To reduce the potential for vessel strikes, BOEM issued NTL 2016-G01, which recommends protected species identification training for vessels operators and that vessel slow down or stop their vessel to avoid striking protected species. The NTL also requires that operators and crews maintain a vigilant watch for marine mammals and report sightings of any injured or dead protected species. Vessel operators and crews are required to attempt to maintain a distance of 91 m (300 ft) or greater when whales are sighted and 45 m (150 ft) when small cetaceans are sighted. When cetaceans are sighted while a vessel is underway, vessels must attempt to remain parallel to the animal's course and avoid excessive speed or abrupt changes in direction until the cetacean has left the area. Vessel operators are required to reduce vessel speed to 10 knots or less when mother/calf pairs, pods, or large assemblages of cetaceans are observed near an

underway vessel, when safety permits. These mitigation measures are only effective during daylight hours, or in sea and weather conditions where cetaceans are sighted. Compliance with NTL BOEM-2016-G01 (see **Table 1**) is expected to minimize the likelihood of vessel strikes as well as reduce the chance for disturbing marine mammals during these periods.

Aircraft traffic has the potential to disturb marine mammals (Würsig et al., 1998). However, while flying offshore, helicopters maintain altitudes above 213 m (700 ft) during transit to and from the working area. In addition, guidelines and regulations specify that helicopters maintain an altitude of 305 m (1,000 ft) within 91 m (300 ft) of marine mammals (BOEM, 2012a, 2016a). Maintaining this flight altitude will minimize the potential for disturbing marine mammals, and no significant impacts are expected (BOEM, 2017a).

Impacts of a Small Fuel Spill

Potential spill impacts on marine mammals are discussed by BOEM (2017a, b). Oil impacts on marine mammals in general are discussed by Geraci and St. Aubin (1990). For this DOCD, there are no unique site-specific issues with respect to spill impacts on non-listed cetaceans.

The probability of a fuel spill is expected to be minimized by BP's preventative measures during fuel transfer. In the unlikely event of a spill, implementation of BP's OSRP is expected to lessen the potential for impacts on marine mammals. DOCD Section 9 provides detail on spill response measures, and those measures are summarized in the EIA. Given the open ocean location of the project area, the limited duration of a small spill, and response efforts, it is expected that any impacts would be brief and minimal.

A small fuel spill in offshore waters would produce a thin sheen on the water surface and introduce the concentrations of petroleum hydrocarbons and their degradation products. Direct physical and physiological effects of exposure to diesel fuel could include skin irritation, inflammation, or necrosis; chemical burns of skin, eyes, and mucous membranes; inhalation of toxic fumes; ingestion of oil directly or via contaminated prey; and stress from the activities and noise of response vessels and aircraft (MMC, 2011). The extent and persistence of impacts would depend on the meteorological and oceanographic conditions at the time and the effectiveness of spill response measures. A small fuel spill would not be expected to make landfall or reach coastal waters prior to breaking up (**Section A.9.1**). Therefore, due to the limited areal extent and short duration of water quality impacts from a small fuel spill as well as the mobility of marine mammals, no significant impacts would be expected.

Impacts of a Large Hydrocarbon Spill

Potential spill impacts on marine mammals are discussed by BOEM (2017a, b). For this DOCD, there are no unique site-specific issues. Impacts of hydrocarbon spills on marine mammals can include direct impacts from oil exposure as well as indirect impacts due to response activities and materials (e.g., vessel traffic, marine sound) (MMC, 2011). Direct physical and physiological effects can include skin irritation, inflammation, or necrosis; chemical burns of skin, eyes, and mucous membranes; inhalation of toxic fumes; ingestion of hydrocarbons directly or via contaminated prey.

Complications of the above may lead to dysfunction of immune (DeGuise et al., 2017) and reproductive systems (Kellar et al., 2017), physiological stress, declining physical condition, and death (MMC, 2011). Indirect impacts can include stress from the activities and noise of response

vessels and aircraft. Behavioral responses can include displacement of animals from prime habitat (McDonald et al., 2017), disruption of social structure, change in prey availability and foraging distribution or patterns, change in reproductive behavior/productivity, and change in movement patterns or migration (MMC, 2011).

In the event of a large spill, response activities that may impact marine mammals include increased vessel traffic, and remediation activities (e.g., controlled burns, skimmers, boom, etc.) (BOEM, 2017a). The increased level of vessel and aircraft activity associated with spill response could disturb marine mammals, potentially resulting in behavioral changes. The large number of response vessels could result in vessel strikes, entanglement or other injury, or stress. Response vessels would operate in accordance with NTL BOEM-2016-G01 to reduce the potential for striking or disturbing these animals, and therefore no significant impacts are expected.

C.3.4 Sea Turtles (Endangered/Threatened)

Five species of endangered or threatened sea turtles may be found near the project area. Endangered species include the leatherback (*Dermochelys coriacea*), Kemp's ridley (*Lepidochelys kempii*), and hawksbill (*Eretmochelys imbricata*) turtles, while the North Atlantic DPS of the green turtle (*Chelonia mydas*) is listed as threatened. The DPS of loggerhead turtles (*Caretta caretta*) that occurs in the Gulf of Mexico is listed as threatened, although other DPSs are endangered.

Critical habitat has been designated for the loggerhead turtle in the Gulf of Mexico as shown in **Figure 2**. Loggerhead turtles in the Gulf of Mexico are part of the Northwest Atlantic Ocean DPS (76 FR 58868). In July 2014, NMFS and the USFWS designated critical habitat for this DPS (NMFS, 2014b). The USFWS designation (79 FR 39756) includes nesting beaches in Jackson County, Mississippi; Baldwin County, Alabama; and Bay, Gulf, and Franklin Counties in the Florida Panhandle as well as several counties in southwest Florida and the Florida Keys (and other areas along the Atlantic coast). The NMFS designation (79 FR 39856) includes nearshore reproductive habitat within 1 mile (1.6 km) seaward of the mean high water line along these same nesting beaches. NMFS also designated a large area of shelf and oceanic waters, termed *Sargassum* habitat, in the Gulf of Mexico (and Atlantic Ocean) as critical habitat. *Sargassum* spp. is a brown algae (Class Phaeophyceae) that has a pelagic existence. Rafts of *Sargassum* spp. serve as important foraging and developmental habitat for numerous fishes, and young sea turtles, including loggerhead turtles. NMFS designated three other categories of critical habitat as well; of these, two (migratory habitat and overwintering habitat) are along the Atlantic coast and the third (breeding habitat) is found in the Florida Keys and along the Florida east coast (NMFS, 2014b).

The nearest designated nearshore reproductive critical habitat for loggerhead sea turtles is approximately 120 statute miles (193 km) north of the project area. The project area is located approximately 7 statute miles (11 km) from the designated *Sargassum* critical habitat for loggerhead sea turtles (**Figure 2**).

Leatherback and loggerhead turtles are the most likely species to be present near the project area as adults. Green, hawksbill, and Kemp's ridley turtles are typically inner shelf and nearshore species, unlikely to occur near the project area as adults. Hatchlings or juveniles of any of the sea turtle species may be present in deepwater areas, including the project area, where they may be associated with floating mats of *Sargassum* spp. and other flotsam.

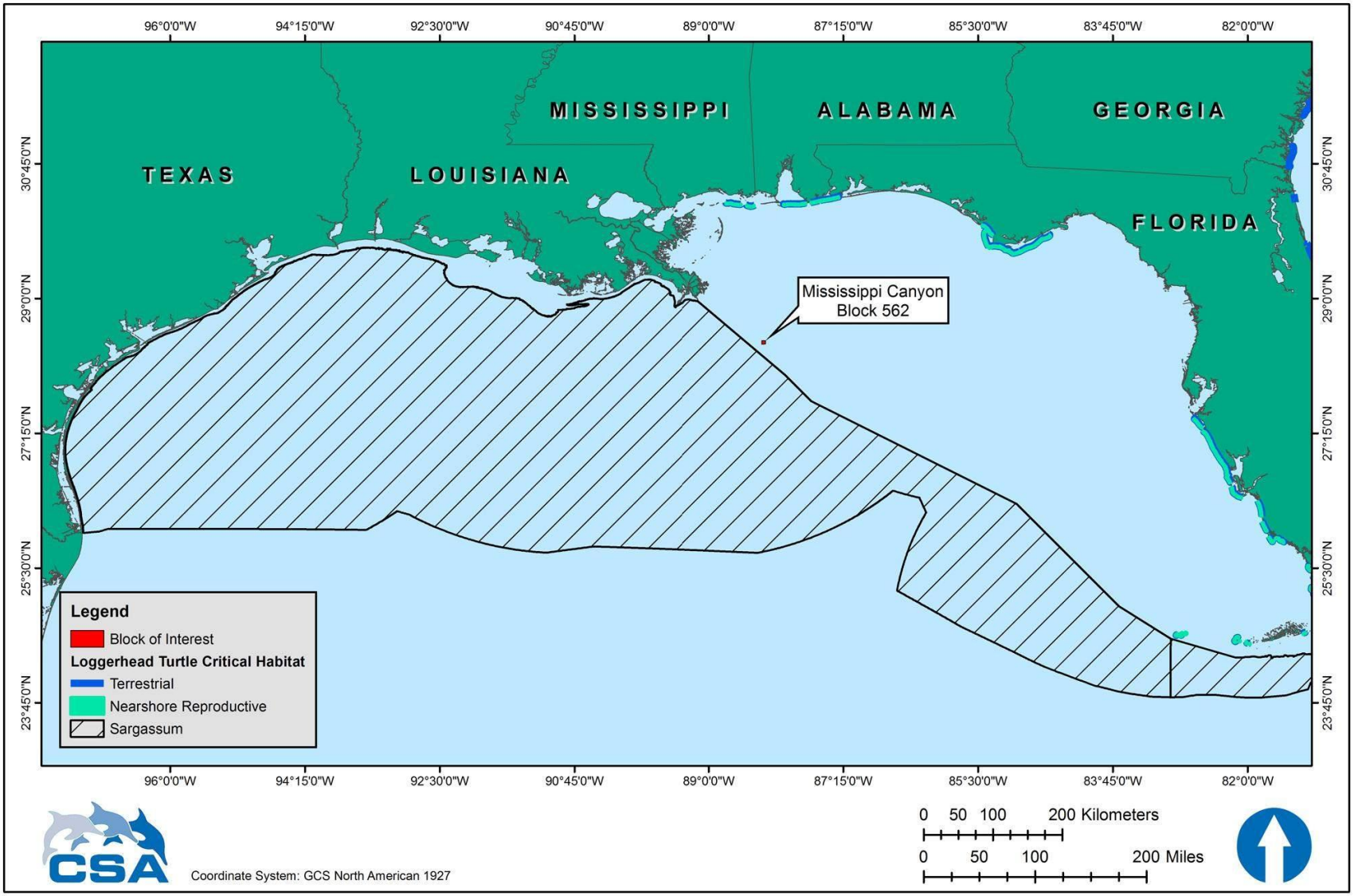

Figure 2. Location of loggerhead turtle designated critical habitat in relation to the project area in Mississippi Canyon Block 562.

All five sea turtle species in the Gulf of Mexico are migratory and use different marine habitats according to their life stage. These habitats include high-energy beaches for nesting females and emerging hatchlings and pelagic convergence zones for hatchling and juvenile turtles. As adults, green, hawksbill, and loggerhead turtles forage primarily in shallow, benthic habitats. Leatherback turtles are the most pelagic of the sea turtles, feeding primarily on jellyfish.

Sea turtle nesting in the northern Gulf of Mexico can be summarized by species as follows:

- Loggerhead turtles – Loggerhead turtles nest in significant numbers along the Florida Panhandle (Florida Fish and Wildlife Conservation Commission, 2018a) and, to a lesser extent, from Texas through Alabama (NMFS and USFWS, 2008).
- Green and leatherback turtles – Green and leatherback turtles infrequently nest on Florida Panhandle beaches (Florida Fish and Wildlife Conservation Commission, 2018b, c).
- Kemp's ridley turtles – The critically endangered Kemp's ridley turtle nests almost exclusively on a 16-mile (26-km) stretch of coastline near Rancho Nuevo in the Mexican state of Tamaulipas (NMFS, 2011). A much smaller but growing population nests in Padre Island National Seashore, Texas, mostly as a result of reintroduction efforts (NMFS, 2011). As of late July 2018, a total of 248 Kemp's ridley turtle nests have been counted on Texas beaches in 2018. A total of 353 Kemp's ridley turtle nests were counted on Texas beaches in 2017, an increase from the 185 counted in 2016, 159 counted in 2015, and 118 counted in 2014 (Turtle Island Restoration Network, 2018). Padre Island National Seashore along the coast of Willacy, Kenedy, and Kleberg Counties in southern Texas, is the most important nesting location for this species in the United States, although there have been occasional reports of Kemp's ridleys nesting in Alabama (Share the Beach, 2016).
- Hawksbill turtles – Hawksbill turtles typically do not nest anywhere near the project area, with most nesting in the region located in the Caribbean Sea and on the beaches of the Yucatán Peninsula (U.S. Fish and Wildlife Service, 2016a).

Impacts of DP Construction Vessel Presence, Noise, and Lights

Sea turtles hear low frequency sounds, mainly below 1,200 Hz (Bartol and Ketten, 2006, Bartol, 2014). Potential impacts may include behavioral disruption and temporary or permanent displacement from the area near the sound source. The currently accepted response estimates are derived from fish hearing data rather than from marine mammal hearing data due to the limited experimental data available (Popper et al., 2014). A NMFS Biological Opinion (NMFS, 2015a) lists sea turtle underwater acoustic injury and behavioral thresholds at 207 dB re 1 µPa and 166 dB re 1 µPa, respectively[2]. No distinction is made between impulsive and continuous sources for these thresholds. Based on transmission loss calculations (see Urick, 1983), open water propagation of noise produced by typical sources with DP thrusters are not expected to produce received levels greater than 160 dB re 1 µPa beyond 32 m (105 ft) from the source. Certain sea turtles, especially loggerheads, may be attracted to offshore structures (Lohoefener et al., 1990, Gitschlag et al., 1997) and, thus, may be more susceptible to impacts from sounds produced during routine operations. The most likely impacts would be short-term behavioral changes such as diving and evasive swimming, disruption of activities, or departure from the area. Due to the small impact area around the installation area, limited number of sources, and

[2] There are no established Temporary Threshold Shift or Permanent Threshold Shift criteria for sea turtles.

short duration of activities, these short-term impacts are not expected to be biologically significant to sea turtle populations.

Artificial lighting can disrupt the nocturnal orientation of sea turtle hatchlings (Witherington, 1997, Tuxbury and Salmon, 2005). However, hatchlings may rely less on light cues when they are offshore than when they are emerging on the beach (Salmon and Wyneken, 1990). NMFS (2007) concluded that the effects of lighting from offshore structures on sea turtles are insignificant.

Impacts of Support Vessel and Helicopter Traffic

Support vessel traffic has the potential to disturb sea turtles, and there is also a risk of vessel strikes. Data show that vessel traffic is one cause of sea turtle mortality in the Gulf of Mexico (Lutcavage et al., 1997). While adult sea turtles are visible at the surface during the day and in clear weather, they can be difficult to spot from a moving vessel when resting below the water surface, during nighttime, or during periods of inclement weather. To reduce the potential for vessel strikes, BOEM issued NTL BOEM-2016-G01, which recommends protected species identification training and that vessel operators and crews maintain a vigilant watch for sea turtles and slow down or stop their vessel to avoid striking protected species, and requires operators to report sightings of any injured or dead protected species. When sea turtles are sighted, vessel operators and crews are required to attempt to maintain a distance of 45 m (150 ft) or greater whenever possible. Compliance with this NTL is expected to minimize the likelihood of vessel strikes during periods of daylight and during sea and weather conditions that permit sighting of turtles on the sea surface (NMFS, 2007).

Noise generated from support helicopter traffic also has the potential to disturb sea turtles. However, while flying offshore, helicopters maintain altitudes above 213 m (700 ft) during transit to and from the working area. This altitude will minimize the potential for disturbing sea turtles, and no significant impacts are expected (NMFS, 2007, BOEM, 2012a).

Impacts of a Small Fuel Spill

Potential spill impacts on sea turtles are discussed by NMFS (2007) and BOEM (2017a, b). For this DOCD, there are no unique site-specific issues with respect to spill impacts on sea turtles.

The probability of a fuel spill is expected to be minimized by BP's preventative measures during fuel transfer. In the unlikely event of a spill, implementation of BP's OSRP is expected to minimize potential impacts on sea turtles. DOCD Section 9 provides detail on spill response measures. Given the open ocean location of the project area, the duration of a small spill and opportunity for impacts to occur would be very brief.

A small fuel spill in offshore waters would produce a thin slick on the water surface and introduce concentrations of petroleum hydrocarbons and their degradation products. Direct physical and physiological effects of exposure to diesel fuel could include skin irritation, inflammation, or necrosis; chemical burns of skin, eyes, and mucous membranes; inhalation of toxic fumes; ingestion of oil directly or via contaminated prey; and stress from the activities and noise of response vessels and aircrafts (NMFS, 2014a). The extent and persistence of impacts would depend on the meteorological and oceanographic conditions at the time and the effectiveness of spill response measures. **Section A.9.1** discusses the likely fate of a small fuel spill and indicates that over 90% is expected to be evaporated or dispersed naturally within 24 hours. The area of the sea surface with diesel fuel on it would range from 0.5 to 5 ha (1.2 to

12 ac), depending on sea state and weather conditions. Therefore, due to the limited areal extent and short duration of water quality impacts from a small fuel spill, no significant impacts to sea turtles from direct or indirect exposure would be expected.

Loggerhead Critical Habitat – Nesting Beaches. A small fuel spill in the project area would be unlikely to affect sea turtle nesting beaches due to the distance from the nearest shoreline. Loggerhead turtle nesting beaches and nearshore reproductive habitat designated as critical habitat are located in Mississippi, Alabama, and the Florida Panhandle, at least 120 statute miles (193 km) from the project area. As explained in **Section A.9.1**, a small fuel spill would not be expected to make landfall or reach coastal waters prior to natural dispersion.

Loggerhead Critical Habitat – *Sargassum.* The project area is approximately 7 statute miles (11 km) from the designated *Sargassum* critical habitat for the loggerhead turtles (**Figure 3**). A small diesel fuel spill could affect *Sargassum* spp. and juvenile turtles by contaminating this habitat. Juvenile sea turtles could come into contact with or ingest oil, resulting in death, injury, or other sublethal effects. Effects of a small spill on *Sargassum* critical habitat for loggerhead turtles would be limited to the small area (0.5 to 5 ha [1.2 to 12 ac]) likely to be impacted by a small spill. An impact area of 5 ha (12 ac) would represent a negligible portion of the approximately 40,662,810 ha (100,480,000 ac) designated *Sargassum* critical habitat for loggerhead turtles in the northern Gulf of Mexico.

Impacts of a Large Hydrocarbon Spill

Impacts of diesel fuel spills on sea turtles can include direct impacts from hydrocarbons exposure as well as indirect impacts due to response activities and materials (e.g., vessel traffic, marine sound). Direct physical and physiological effects can include skin irritation, inflammation, or necrosis; chemical burns of skin, eyes, and mucous membranes; ingestion of hydrocarbons directly or via contaminated food; and stress from the activities and marine sound of response vessels and aircraft. Complications of the above may lead to dysfunction of immune and reproductive systems, physiological stress, declining physical condition, and death (NOAA, 2010). Behavioral responses can include displacement of animals from prime habitat, disruption of social structure, changing food availability and foraging distribution and/or patterns, changing reproductive behavior/productivity, and changing movement patterns or migration (NOAA, 2010, NMFS, 2014a). In the unlikely event of a spill, implementation of BP's OSRP is expected to minimize the potential for these types of impacts on sea turtles. DOCD Section 9 provides further details on spill response measures.

Studies on loggerhead turtles in a controlled setting (NOAA, 2010, Lutcavage et al., 1995) suggest that sea turtles show no avoidance behavior when they encounter an oil slick, and any sea turtle in an affected area would be expected to be exposed. Sea turtles' diving behaviors also put them at risk because they rapidly inhale a large volume of air before diving and continually resurface over time, which may result in repeated exposure to volatile vapors and oiling (NMFS, 2007).

Loggerhead Critical Habitat – Nesting Beaches. If spilled hydrocarbons reaches sea turtle nesting beaches, nesting sea turtles and egg development could be affected (NMFS, 2007). An oiled beach could affect nest site selection or result in no nesting at all (e.g., false crawls). Upon hatching and successfully reaching the water, hatchlings are subject to the same types of oil spill exposure hazards as adults. Hatchlings that contact oil residues while crossing a beach can

exhibit a range of effects, from acute toxicity to impaired movement and normal bodily functions (NMFS, 2007).

The 30-day OSRA results summarized in **Table 4** estimate that Louisiana and Florida shorelines that may support limited sea turtle nesting could be contacted within 30 days (1 to 11% conditional probability). Plaquemines Parish in Louisiana is the coastal area most likely to be affected (5% probability within 10 days; and 11% probability within 30 days). The 60-day OSRA modeling (**Table 5**) predicts the conditional probability of oil contacting any shoreline that contain nearshore reproductive critical habitat for the loggerhead turtle is 18% or less within 60 days of a spill. The nearest nearshore reproductive critical habitat for the loggerhead turtle in Baldwin County, Alabama, is 120 statute miles (193 km) from the project area.

Loggerhead Critical Habitat – *Sargassum*. The project area is approximately 7 statute miles (11 km) from the loggerhead turtle critical habitat designated as *Sargassum* habitat, which includes most of the Western and Central Planning Areas in the Gulf of Mexico and parts of the southern portion of the Eastern Planning Area (**Figure 3**) (NMFS, 2014b). Because of the large area covered by the designated *Sargassum* habitat for loggerhead turtles, a large spill could result in a substantial part of the *Sargassum* habitat in the northern Gulf of Mexico being oiled. However, the 2010 Macondo spill affected approximately one-third of the *Sargassum* habitat in the northern Gulf of Mexico (BOEM, 2014). It is extremely unlikely that the entire *Sargassum* critical habitat would be affected by a large spill.

The effects of oiling on *Sargassum* spp. vary with spill severity, but moderate to heavy oiling that could occur during a large spill could cause complete mortality to *Sargassum* and its associated communities (BOEM, 2017a). *Sargassum* spp. has the potential to sink during a large spill, thus temporarily removing the habitat and possibly being an additional pathway of exposure to the benthic environment (Powers et al., 2013). Lower levels of oiling may cause sub-lethal affects, including a reductrion in growth, productivity, and recruitment of organisms associated with *Sargassum* spp. The *Sargassum* spp. algae itself could be less impacted by light to moderate oiling than associated organisms because of a waxy outer layer that might help protect it from oiling (BOEM, 2016b) *Sargassum* spp. has a yearly seasonal cycle of growth and a yearly cycle of migration from the Gulf of Mexico to the western Atlantic. A large spill could affect a large portion of the annual crop of the algae; however, because of its ubiquitous distribution and seasonal cycle, recovery of the *Sargassum* spp. community would be expected to occur within a short time (BOEM, 2017a).

In the event of a large spill, the level of vessel and aircraft activity associated with spill response could disturb sea turtles and potentially result in vessel strikes, entanglement, or other injury or stress. Response vessels would operate in accordance with NTL BOEM-2016-G01 to reduce the potential for striking or disturbing sea turtles.

C.3.5 Piping Plover (Threatened)

The Piping Plover (*Charadrius melodus*) is a migratory shorebird that overwinters along the southeastern U.S. and Gulf of Mexico coasts. This threatened species is in decline as a result of hunting, habitat loss and modification, predation, and disease (U.S. Fish and Wildlife Service, 2003). Critical overwintering habitat has been designated, including beaches in Texas, Louisiana, Mississippi, Alabama, and Florida (**Figure 3**). Piping Plovers inhabit coastal sandy beaches and

mudflats, feeding by probing for invertebrates at or just below the surface. They use beaches adjacent to foraging areas for roosting and preening (U.S. Fish and Wildlife Service, nd).

A large hydrocarbon spill is the only IPF that potentially may affect Piping Plovers. There are no IPFs associated with routine project activities that could affect these birds. A small fuel spill in the project area would be unlikely to affect Piping Plovers because a small fuel spill would not be expected to make landfall or reach coastal waters prior to breaking up (see explanation in **Section A.9.1**). Noise from helicopters would be unlikely to significantly affect piping plover populations, because it is assumed that helicopters will maintain an altitude of 305 m (1,000 ft) over unpopulated areas or across coastlines.

Impacts of a Large Hydrocarbon Spill

The project area is approximately 64 statute miles (101 km) from the nearest shorelines designated as critical habitat for the Piping Plover (**Figure 3**). The 30-day OSRA modeling (**Table 4**) predicts that Piping Plover critical habitat in Plaquemines Parish, Louisiana could be contacted within 10 days of a spill (5% conditional probability). The 60-day OSRA modeling (**Table 5**) predicts that during the fall, there is a 24% conditional probability that an oil spill from the project area would reach a shoreline designated as critical habitat for the Piping Plover within 60 days of a spill.

Plovers could physically oil themselves while foraging on contaminated shores or secondarily contaminate themselves through ingestion of oiled intertidal sediments and prey (BOEM, 2017a, b). Piping Plovers congregate and feed along tidally-exposed banks and shorelines, following the tidal boundary and foraging at the water's edge. It is possible that some deaths of Piping Plovers could occur, especially if spills occur during winter months when plovers are most common along the coastal Gulf or if spills contacted critical habitat. Impacts could also occur from vehicular traffic on beaches and other activities associated with spill cleanup. BP has extensive resources available to protect and rehabilitate wildlife in the event of a spill reaching the shoreline, as detailed in the OSRP.

C.3.6 Whooping Crane (Endangered)

The Whooping Crane (*Grus americana*) is a large omnivorous wading bird listed as an endangered species. Three wild populations live in North America (National Wildlife Federation, 2016). One population winters along the Texas coast at Aransas NWR and summers at Wood Buffalo National Park in Canada. This population represents the majority of the world's population of free-ranging Whooping Cranes, reaching a record estimated population of 431 during the 2016 to 2017 winter (U.S. Fish and Wildlife Service, 2017). A non-migrating population was reintroduced in central Florida, and another reintroduced population summers in Wisconsin and migrates to the southeastern U.S. for the winter. Whooping Cranes breed, migrate, winter, and forage in a variety of habitats, including coastal marshes and estuaries, inland marshes, lakes, ponds, wet meadows and rivers, and agricultural fields (U.S. Fish and Wildlife Service, 2007). About 9,000 ha (22,240 ac) of salt flats on Aransas NWR and adjacent islands comprise the principal wintering grounds of the Whooping Crane. Aransas NWR is designated as critical habitat for the species.

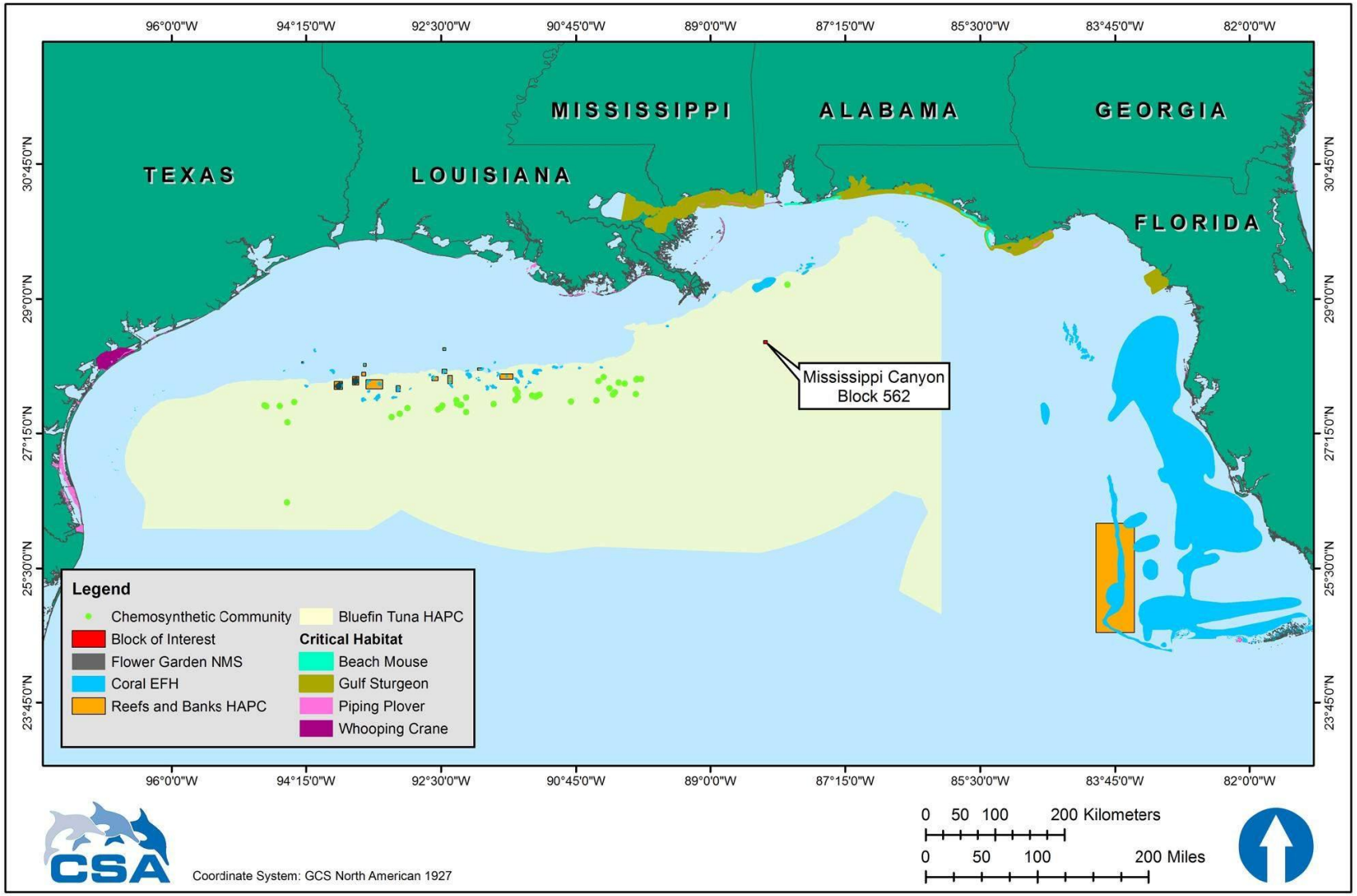

Figure 3. Location of selected environmental features in relation to the project area in Mississippi Canyon Block 562.

A large hydrocarbon spill is the only IPF that potentially may affect Whooping Cranes. A small fuel spill in the project area would also be unlikely to affect Whooping Cranes, due to the distance from Aransas NWR. As explained in **Section A.9.1**, a small fuel spill would not be expected to make landfall or reach coastal waters prior natural dispersion.

Impacts of a Large Hydrocarbon Spill

A large hydrocarbon spill is unlikely to affect Whooping Cranes as the project area is approximately 496 statute miles (798 km) from the Aransas NWR, which is the nearest designated critical habitat. The 30-day OSRA modeling (**Table 4**) predicts a <0.5% or less chance of oil contacting Whooping Crane critical habitat within 30 days of a spill. The 60-day OSRA model (**Table 5**) predicts that there is a <0.5% or less chance oil contacting Whooping Crane critical habitat within 60 days of a spill.

In the event of oil exposure, Whooping Cranes could physically oil themselves while foraging in oiled areas or secondarily contaminate themselves through ingestion of contaminated prey items. It is possible that some Whooping Crane deaths could occur, especially if a spill occurred during winter months when Whooping Cranes are most common along the Texas coast and if the spill contacts their critical habitat in Aransas NWR. Impacts could also occur from vehicular traffic on beaches and other activities associated with spill cleanup. In the event of a spill, BP would work with the applicable state and federal agencies to prevent impacts on Whooping Cranes. BP has extensive resources available to protect and rehabilitate wildlife in the event of a spill reaching the shoreline, as detailed in the OSRP.

C.3.7 Oceanic Whitetip Shark (Threatened)

The oceanic whitetip shark (*Carcharhinus longimanus*) was listed as threatened under the ESA effective 30 March 2018 by NMFS (83 FR 4153). Oceanic whitetip sharks are found worldwide in offshore waters between approximately 30° N and 35° S latitude, and have generally been described as one of the most abundant species of oceanic sharks (Compagno, 1984). However, the population trend appears to be decreasing as the species is now only occasionally reported in the Gulf of Mexico (Baum et al., 2015).

A comparison of historical shark catch rates in the Gulf of Mexico by Baum and Myers (2004) noted that most recent papers described the oceanic whitetip shark as rare or absent in the Gulf of Mexico. NMFS (2018) noted that there has been an 88% decline in abundance of the species in the Gulf of Mexico since the mid-1990s due to commercial fishing pressure.

IPFs that could affect the oceanic whitetip shark include DP construction vessel presence, noise, and lights, and a large hydrocarbon spill. Impacts from effluent discharges are not expected due to rapid dilution of effluents and adherence to NPDES permit limits and requirements. A small diesel fuel spill in the project area would be unlikely to affect oceanic whitetip sharks due to rapid natural dispersion of diesel fuel and the low density of oceanic whitetip sharks potentially present in the project area.

Impacts of DP Construction Vessel Presence, Noise, and Lights

Offshore activities produce a broad array of sounds at frequencies and intensities that may be detected by sharks including the threatened oceanic whitetip shark. Shark hearing abilities have the highest sensitivity to low frequency sounds between approximately 40 and 800 Hz (Myrberg, 2000). Sharks are most attracted to sounds in broadband frequencies below 80 Hz (Myrberg,

2000), a frequency that overlaps with sound pressure levels associated with installation activities (typically 10 Hz to 10 kHz) (Hildebrand, 2005). DP construction vessel noise could also influence prey behaviors such as predator avoidance, foraging, reproduction, and intraspecific interactions (Picciulin et al., 2010, Bruintjes and Radford, 2013, McLaughlin and Kunc, 2015, Nedelec et al., 2017). However, because of the limited propagation distances of high sound pressure levels, impacts would be limited in geographic scope and no population level impacts on oceanic whitetip sharks are expected.

Impacts of a Large Hydrocarbon Spill

Information regarding the direct effects of oil on elasmobranchs, including the oceanic whitetip shark are largely unknown. However, in the event of a large hydrocarbon spill, oceanic whitetip sharks could be affected by direct ingestion, ingestion of oiled prey, or the absorption of dissolved petroleum products through the gills. Because oceanic whitetip sharks may be found in surface waters, they could be more likely to be impacted by floating oil than other species which only reside at depth.

It is possible that a large hydrocarbon spill could affect individual oceanic whitetip sharks and result in injuries or deaths. However, due to the low density of oceanic whitetip sharks thought to exist in the Gulf of Mexico, it is unlikely that a large spill would result in population level effects.

C.3.8 Gulf Sturgeon (Threatened)

The Gulf sturgeon (*Acipenser oxyrinchus desotoi*) is a threatened fish species that inhabits major rivers and inner shelf waters from the Mississippi River to the Suwannee River, Florida (Barkuloo, 1988, Wakeford, 2001). Sturgeon are anadromous fish that migrate from the sea upstream into coastal rivers to spawn in freshwater.

The historic range of the species extended from the Mississippi River to Charlotte Harbor, Florida (Wakeford, 2001). This range has contracted to encompass major rivers and inner shelf waters from the Mississippi River to the Suwannee River, Florida. Populations have been depleted or even extirpated throughout this range by fishing, shoreline development, dam construction, water quality changes, and other factors (Barkuloo, 1988, Wakeford, 2001). These declines prompted the listing of the Gulf sturgeon as a threatened species in 1991. The best-known populations occur in the Apalachicola and Suwannee Rivers in Florida (Carr, 1996, Sulak and Clugston, 1998), the Choctawhatchee River in Alabama (Fox et al., 2000), and the Pearl River in Mississippi/Louisiana (Morrow et al., 1998). Rudd et al. (2014) reconfirmed the spatial distribution and movement patterns of Gulf Sturgeon by surgically implanting acoustic telemetry tags. Critical habitat in the Gulf extends from Lake Borgne, Louisiana (St. Bernard Parish), to Suwannee Sound, Florida (Levy County) (NMFS, 2014c) (**Figure 3**). A species description is presented by BOEM (2012a) and in the recovery plan for this species (USFWS et al., 1995).

A large hydrocarbon spill is the only IPF that could potentially affect Gulf sturgeon. There are no IPFs associated with routine project activities that could affect these fish. A small fuel spill in the project area would be unlikely to affect Gulf sturgeon because a small fuel spill would not be expected to make landfall or reach coastal waters prior to breaking up (see explanation in **Section A.9.1**).

Impacts of a Large Hydrocarbon Spill

Potential spill impacts on Gulf sturgeon are discussed by NMFS (2007) and BOEM (2012a, 2017a, b). For this DOCD, there are no unique site-specific issues with respect to this species.

The project area is approximately 119 statute miles (192 km) from the nearest Gulf sturgeon critical habitat. The 30-day OSRA modeling (**Table 4**) predicts that a spill in the project area has 2% or less conditional probability of contacting any coastal areas containing Gulf sturgeon critical habitat within 30 days of a spill. The 60-day OSRA modeling (**Table 5**) predicts that a spill in the project area has a 19% or less conditional probability of contacting any coastal areas containing Gulf sturgeon critical habitat within 60 days of a spill.

In the event of oil reaching Gulf sturgeon habitat, the fish could be affected by direct ingestion, ingestion of oiled prey, or the absorption of dissolved petroleum products through the gills. Based on the life history of this species, sub-adult and adult Gulf sturgeon would be most vulnerable to an estuarine or marine oil spill, and would be vulnerable only from 1 September through 30 April when this species is foraging in estuarine and shallow marine habitats (NMFS, 2007).

C.3.9 Beach Mice (Endangered)

Four subspecies of endangered beach mouse (*Peromyscus polionotus*) occur on the barrier islands of Alabama and the Florida Panhandle. They are the Alabama, Choctawhatchee, Perdido Key, and St. Andrew beach mice. Critical habitat has been designated for all four subspecies; combined critical habitat for the subspecies is shown in **Figure 3**. Species descriptions are provided by BOEM (2012a).

A large hydrocarbon spill is the only IPF that potentially may affect beach mice. There are no IPFs associated with routine project activities that could affect these animals due to the distance from shore and the lack of any onshore support activities near their habitat. A small fuel spill in the project area would not affect beach mice because a small fuel spill would not be expected to reach beach mice habitat prior to dispersion and weathering (see **Section A.9.1**).

Impacts of a Large Hydrocarbon Spill

Potential spill impacts on beach mice are discussed by BOEM (2017a, b). For this DOCD, there are no unique site-specific issues with respect to these species that were not analyzed in these documents.

Beach mouse critical habitat in Baldwin County, Alabama, is approximately 123 statute miles (198 km) from the project area. The 30-day OSRA modeling (**Table 4**) predicts that a spill in the project area has <0.5% or less conditional probability of contacting any coastal areas containing beach mouse critical habitat within 30 days of a spill. The 60-day OSRA modeling (**Table 5**) predicts that a spill in the project areas has an 18% or less conditional probability of contacting any coastal areas containing beach mouse critical habitat within 60 days of a spill.

In the event of hydrocarbons contacting these beaches, beach mice could experience several types of direct and indirect impacts. Contact with spilled oil could cause skin and eye irritation and subsequent infection; matting of fur; irritation of sweat glands, ear tissues, and throat tissues; disruption of sight and hearing; asphyxiation from inhalation of fumes; and toxicity from ingestion of oil and contaminated food. Indirect impacts could include reduction of food supply,

destruction of habitat, and fouling of nests. Impacts could also occur from vehicular traffic and other activities associated with spill cleanup. However, any such impacts are unlikely due to the distance from shore and response actions that would occur in the event of a spill.

C.3.10 Threatened Coral Species

Four threatened coral species are known from the northern Gulf of Mexico: elkhorn coral (*Acropora palmata*), lobed star coral (*Orbicella annularis*), mountainous star coral (*Orbicella faveolata*), and boulder star coral (*Orbicella franksi*). These species have been reported from the Flower Garden Banks (NOAA, 2017b), but are unlikely to be present as regular residents anywhere else in the northern Gulf of Mexico because they typically inhabit coral reefs in shallow, clear tropical or subtropical waters. Other Caribbean coral species evaluated by NMFS in 2014 (79 FR 53852) either do not meet the criteria for ESA listing or are not known from the Flower Garden Banks. Critical habitat has been designated for elkhorn corals in the Florida Keys, but none has been designated for the other threatened coral species included here. A species description of elkhorn coral is presented in the recovery plan for the species (NMFS, 2015b).

There are no IPFs associated with routine project activities that could affect threatened corals in the northern Gulf of Mexico. A small fuel spill is not expected to affect threatened coral species because the oil would float and dissipate on the sea surface. A large hydrocarbon spill may be the only relevant IPF.

Impacts of a Large Hydrocarbon Spill

Based on the 60-day OSRA modeling results (**Table 5**), a large hydrocarbon spill would be unlikely (<0.5% probability) to reach elkhorn coral critical habitat in the Florida Keys (Monroe County, Florida). A spill would be unlikely to contact the corals of the Flower Garden Banks based on the distance between the project area and the Flower Garden Banks (approximately 337 statute miles [542 km]), and the difference in water depth between the project area (1,962 m [6,436 ft]) and the Banks (approximately 17 to 145 m [56 to 476 ft]). While on the surface, oil would not be expected to contact corals growing on the seafloor, but could feasibly impact planktonic larvae.

In the unlikely event that a slick reached reefs at the Flower Garden Banks or other Gulf of Mexico reefs, hydrocarbon droplets or contaminated sediment particles could come into contact with reef organisms or corals. As discussed by BOEM (2017a, b), impacts could include loss of habitat, biodiversity, and live coral coverage; destruction of hard substrate; change in sediment characteristics; and reduction or loss of one or more commercial and recreational fishery habitats. Sub-lethal effects could be long-lasting and affect the resilience of coral colonies to natural disturbances (e.g., elevated water temperature and diseases) (BOEM, 2017a).

Due to the distance between the project area and coral habitats, there is a low chance of hydrocarbons contacting threatened coral habitat in the event of a spill, and no significant impacts on threatened coral species are expected.

C.4 Coastal and Marine Birds

C.4.1 Marine Birds

Marine birds include seabirds and other species that may occur in the pelagic environment of the project area (Clapp et al., 1982a, Clapp et al., 1982b, 1983, Peake, 1996, Hess and Ribic, 2000). Seabirds spend much of their lives offshore over the open ocean, except during breeding season when they nest along the coast (on the mainland and on barrier islands). In addition, other birds such as waterfowl, marsh birds, and shorebirds may occasionally be present over open ocean areas. No endangered or threatened bird species are likely to occur at the project area due to the distance from shore. For a discussion of shorebirds and coastal nesting birds, see **Section C.4.2**.

Seabirds of the northern Gulf of Mexico were surveyed from ships during the GulfCet II program (Davis et al., 2000b). Hess and Ribic (2000) reported that terns, storm-petrels, shearwaters, and jaegers were the most frequently sighted seabirds in the deepwater area. From these surveys, four ecological categories of seabirds were documented in the deepwater areas of the Gulf: summer migrants (shearwaters, storm petrels, boobies); summer residents that breed in the Gulf (Sooty Tern, Least Tern, Sandwich Tern, Magnificent Frigatebird); winter residents (gannets, gulls, jaegers); and permanent resident species (Laughing Gulls, Royal Terns, Bridled Terns) (Hess and Ribic, 2000).

Common seabird species include Wilson's Storm-Petrel (*Oceanites oceanicus*), Magnificent Frigatebird (*Fregata magnificens*), Northern Gannet (*Morus bassanus*), Masked Booby (*Sula dactylatra*), Brown Booby (*Sula leucogaster*), Cory's Shearwater (*Calonectris diomedea*), Greater Shearwater (*Puffinus gravis*), and Audubon's Shearwater (*Puffinus lherminieri*). Seabirds are distributed Gulf-wide and are not specifically associated with the project area.

Relationships with hydrographic features were found for several seabird species, possibly due to effects of hydrography on nutrient levels and productivity of surface waters where birds forage. The GulfCet II study did not estimate bird densities; however, seabird densities over the open ocean were estimated to be 1.6 birds km^{-2} (Haney et al., 2014).

Trans-Gulf migrant birds including shorebirds, wading birds, and terrestrial birds may be present in the project area. Migrant birds may use offshore structures, including platforms and semisubmersibles for resting, feeding, or as temporary shelter from inclement weather (Russell, 2005). Some birds may be attracted to offshore structures because of the lights and the fish populations that aggregate around these structures.

IPFs that potentially may affect marine birds include DP construction vessel presence, marine sound, and lights; support vessel and helicopter traffic; and two types of accidents (a small fuel spill and a large hydrocarbon spill). Effluent discharges permitted under the NPDES are likely to have negligible impacts on the birds due to rapid dispersion, the small area of ocean affected, the intermittent nature of the discharges, and the mobility of these animals. Compliance with NTL BSEE-2015-G03 is expected to minimize the potential for marine debris-related impacts on birds. The IPFs with potential impacts listed in **Table 2** are discussed below.

Impacts of DP Construction Vessel Presence, Underwater Sound, and Lights

Marine birds that frequent offshore platforms may be exposed to contaminants including air pollutants and routine discharges, but significant impacts are unlikely due to rapid dispersion. Birds migrating over water have been known to strike offshore structures, resulting in injury and/or death (Wiese et al., 2001, Russell, 2005). Mortality of migrant birds at tall towers and other land-based structures has been reviewed extensively, and the mechanisms involved in rig collisions appear to be similar. In some cases, migrants simply do not see a part of the rig until it is too late to avoid it. In other cases, navigation may be disrupted by marine sound (Russell, 2005). On the other hand, offshore structures are suitable stopover perches for most trans-Gulf migrant species, and most of the migrants that stop over on rigs probably benefit from their stay, particularly in spring (Russell, 2005). Due to the limited scope and short duration of installation activities described in this DOCD, any impacts on populations of either seabirds or trans-Gulf migrant birds are not expected to be significant.

Impacts of Support Vessel and Helicopter Traffic

Support vessels and helicopters are unlikely to significantly disturb marine birds in open, offshore waters. It is likely that individual birds would experience, at most, only short-term behavioral disruption, and the impact would not be significant.

Impacts of a Small Fuel Spill

Potential spill impacts on marine birds are discussed by BOEM (2017a, b). For this DOCD, there are no unique site-specific issues with respect to spill impacts on these animals.

The probability of a fuel spill is expected to be minimized by BP's preventative measures during routine operations, including fuel transfer. In the unlikely event of a spill, implementation of BP's OSRP is expected to reduce the potential for impacts on marine and pelagic birds. DOCD Section 9 provides detail on spill response measures. Given the open ocean location of the project area and the expected short duration of a small fuel spill, the potential exposure period for pelagic marine birds would be brief.

A small fuel spill in offshore waters would produce a slick on the water surface and increase the concentrations of petroleum hydrocarbons and their degradation products. The extent and persistence of impacts would depend on the meteorological and oceanographic conditions at the time and the effectiveness of spill response measures. **Section A.9.1** discusses the likely fate of a small fuel spill and indicates that over 90% is expected to be evaporated or dispersed naturally within 24 hours. The area of the sea surface with diesel fuel on it would range from 0.5 to 5 ha (1.2 to 12 ac), depending on sea state and weather conditions.

Birds exposed to diesel fuel on the sea surface could experience direct physical and physiological effects including skin irritation; chemical burns of skin, eyes, and mucous membranes; and inhalation of VOCs (BOEM, 2017b). Due to the limited areal extent and short duration of water quality impacts from a small fuel spill, secondary impacts due to ingestion of oil via contaminated prey or reductions in prey abundance are unlikely. Due to the low densities of marine birds in open ocean areas, the small area affected, and the brief duration of the surface slick, no significant impacts on pelagic birds would be expected.

Impacts of a Large Hydrocarbon Spill

Potential spill impacts on marine and pelagic birds are discussed by BOEM (2017a, b). For this DOCD, there are no unique site-specific issues with respect to spill impacts on these animals.

Pelagic seabirds could be exposed to oil from a spill at the project area. Hess and Ribic (2000) reported that terns, storm-petrels, shearwaters, and jaegers were the most frequently sighted seabirds in the deepwater Gulf of Mexico (>200 m). Seabird densities over the open were estimated to be 1.6 birds km^{-2} (Haney et al., 2014). The number of pelagic birds that could be affected in open, offshore waters would depend on the extent and persistence of the oil slick.

Data following the *Deepwater Horizon* incident provide relevant information about the species of marine birds that may be affected in the event of a large hydrocarbon spill. Birds that were treated for oiling include several marine species such as the Northern Gannet, Magnificent Frigatebird, and Masked Booby (U.S. Fish and Wildlife Service, 2011). The Northern Gannet is among the species with the largest numbers of birds affected by the spill. Exposure of marine birds to oil can result in adverse health with severity, depending on the level of oiling. Effects can range from plumage damage and loss of buoyancy from external oiling to more severe effects, such as organ damage, immune suppression, endocrine imbalance, reduced aerobic capacity, and death as a result of oil inhalation or ingestion (NOAA, 2016b).

C.4.2 Coastal Birds

Threatened and endangered bird species (Piping Plover and Whooping Crane) were discussed previously in **Sections C.3.5** and **C.3.6**. Various species of non-endangered birds are found along the northern Gulf Coast, including diving birds, shorebirds, marsh birds, wading birds, and waterfowl. Gulf Coast marshes and beaches provide important feeding and nesting habitats. Species that nest on beaches, flats, dunes, bars, barrier islands, and similar coastal and nearshore habitats include the Sandwich Tern, Wilson's Plover, Black Skimmer, Forster's Tern, Gull-Billed Tern, Laughing Gull, Least Tern, and Royal Tern (U.S. Fish and Wildlife Service, 2010).

The Eastern Brown Pelican (*Pelecanus occidentalis*) was delisted from federal endangered status in 2009 (U.S. Fish and Wildlife Service, 2016b). However, this species remains listed as endangered by both Louisiana (State of Louisiana Department of Wildlife and Fisheries, nd) and Mississippi (Mississippi Natural Heritage Program, 2018). The Brown Pelican was delisted as a species of special concern by the State of Florida in 2017 (Florida Fish and Wildlife Conservation Commission, 2017). Brown Pelicans inhabit coastal habitats and forage within both coastal waters and waters of the inner continental shelf. Aerial and shipboard surveys, including GulfCet and GulfCet II, indicate that Brown Pelicans do not occur in deep offshore waters (Fritts and Reynolds, 1981, Peake, 1996, Hess and Ribic, 2000). Nearly half the southeastern population of Brown Pelicans lives in the northern Gulf Coast, generally nesting on protected islands (U.S. Fish and Wildlife Service, 2010).

The Southern Bald Eagle (*Haliaeetus leucocephalus*) was delisted from its threatened status in the lower 48 states on 28 June 2007, but still receives protection under the Migratory Bird Treaty Act of 1918 and the Bald and Golden Eagle Protection Act of 1940. The Bald Eagle is a terrestrial raptor widely distributed across the southern U.S., including coastal habitats along the Gulf of Mexico. The Gulf Coast is inhabited by both wintering migrant and resident Bald Eagles (Johnsgard, 1990, Ehrlich et al., 1992).

IPFs that potentially may affect shorebirds and coastal nesting birds include support vessel and helicopter traffic and a large hydrocarbon spill. A small fuel spill in the project area would be unlikely to affect shorebirds or coastal nesting birds, as the project area is 64 statute miles (103 km) from the nearest shoreline. As explained in **Section A.9.1**, a small fuel spill would not be expected to make landfall or reach coastal waters prior to dispersion and weathering. Compliance with NTL BSEE-2015-G03 is expected to minimize the potential for marine debris-related impacts on shorebirds.

Impacts of Support Vessel and Helicopter Traffic

Support vessels and helicopters will transit coastal areas near Port Fourchon and Houma, Louisiana, where shorebirds and coastal nesting birds may be found. These activities could periodically disturb individuals or groups of birds within coastal habitats (e.g., wetlands that may support feeding, resting, or breeding birds).

Vessel traffic may disturb some foraging and resting birds. Flushing distances vary among species and among individuals (Rodgers and Schwikert, 2002). The disturbances will be limited to flushing birds away from vessel pathways; known distances are from 20 to 49 m (65 to 160 ft) for personal watercrafts and 23 to 58 m (75 to 190 ft) for outboard-powered boats (Rodgers and Schwikert, 2002). Support vessels will not approach nesting or breeding areas on the shoreline, so disturbances to nesting birds, eggs, and chicks is not expected. Vessel operators are expected to use designated navigation channels and comply with posted speed and wake restrictions while transiting sensitive inland waterways. Due to the limited scope and short duration of installation activities, any short-term impacts are not expected to be significant to coastal bird populations.

Aircraft traffic can cause some disturbance to birds onshore and offshore. Responses are highly dependent on the type of aircraft, the bird species, the activities that the animals were previously engaged in, and previous exposures to overflights (Efromyson et al., 2003). Helicopters seem to cause the most intense responses over other human disturbances (Bélanger and Bédard, 1989). The Federal Aviation Administration recommends (Advisory Circular No. 91-36D) that pilots maintain a minimum altitude of 610 m (2,000 ft) when flying over marine sound-sensitive areas such as parks, forest, primitive areas, wilderness areas, National Seashores, or National Wildlife Refuges, and maintain flight paths to reduce aircraft marine sound in these marine sound-sensitive areas. The 2,000-ft altitude minimum is greater than the distance (slant range) at which aircraft overflights have been reported to cause behavioral effects on most species of birds studied by Efroymson et al. (2000). With adherence to the Federal Aviation Administration guidelines, it is likely that individual birds would experience, at worst, only short-term behavioral disruption from aircraft traffic.

Impacts of Large Hydrocarbon Spill

The 30-day OSRA results summarized in **Table 4** estimate that Lafourche and Plaquemines Parishes, Louisiana, could be contacted within 10 days (1% to 5% conditional probabilities) and Louisiana and Florida shorelines could be affected within 30 days (1% to 11% conditional probability). The 60-day OSRA modeling (**Table 5**) predicts that shorelines between Matagorda County, Texas, and Levy County, Florida, have up to a 24% probability of contact within 60 days of a spill.

Coastal birds can be exposed to hydrocarbons as they float on the water surface, dive during foraging, or wade in oiled coastal waters. Oiled birds can lose the ability to fly, dive for food, or float on the water, which could lead to drowning (U.S. Fish and Wildlife Service, 2010). Oil interferes with the water repellency of feathers and can cause hypothermia under certain conditions. As birds groom themselves, they can ingest and inhale the oil on their bodies. Scavengers such as Bald Eagles and gulls can be exposed to hydrocarbons by feeding on carcasses of contaminated fish and wildlife. While ingestion can kill animals immediately, more often it results in lung, liver, and kidney damage, which can lead to death (BOEM, 2017a). Bird eggs may be damaged if an oiled adult sits on the nest.

Brown and White Pelicans are especially at risk from direct and indirect impacts from spilled oil within inner shelf and inshore waters, such as embayments. The range of these species are generally limited to these waters and surrounding coastal habitats. Brown Pelicans feed on mid-sized fish that they capture by diving from above ("plunge diving") and then scoop the fish into their expandable gular pouch, while White Pelicans feed from the surface by dipping their beaks in the water. These behaviors make pelicans susceptible to plumage oiling if they feed in areas with surface sheen. They may also capture prey that has been physically contaminated with oil or has ingested oil. Issues for Brown and White Pelicans include direct contact with oil, disturbance by cleanup activities, and long-term habitat contamination (BOEM, 2017a).

The Bald Eagle may also be at risk from direct and indirect impacts from spilled oil. This species often captures fish within shallow water areas (snatching prey from the surface or wading into shallow areas to capture prey with their bill) and so may be susceptible to plumage oiling and, as with the Brown and White Pelicans, they may also capture prey that has been physically contaminated with oil or has ingested oil (BOEM, 2017a). It is expected that impacts to coastal birds from a large hydrocarbon spill resulting in the death of individual birds would be adverse but not significant at population levels.

C.5 Fisheries Resources

C.5.1 Pelagic Communities and Ichthyoplankton

Biggs and Ressler (2000) reviewed the biology of pelagic communities in the deepwater environment of the northern Gulf of Mexico. The biological oceanography of the region is dominated by the influence of the Loop Current, whose surface waters are among the most oligotrophic in the world's oceans. Superimposed on this low-productivity condition are productive "hot spots" associated with entrainment of nutrient-rich Mississippi River water and mesoscale oceanographic features. Anticyclonic and cyclonic hydrographic features play an important role in determining biogeographic patterns and controlling primary productivity in the northern Gulf of Mexico (Biggs and Ressler, 2000).

Most fishes inhabiting shelf or oceanic waters of the Gulf of Mexico have planktonic eggs and larvae (Ditty, 1986, Ditty et al., 1988, Richards et al., 1989, Richards et al., 1993). A study by Ross et al. (2012) on midwater fauna to characterize vertical distribution of mesopelagic fishes in selected deepwater areas in the Gulf of Mexico substantiated high species richness but general domination by relatively few families and species.

IPFs that potentially may affect pelagic communities and ichthyoplankton include DP construction vessel presence, marine sound, and lights; effluent discharges; water intake; and two types of accidents (a small fuel spill and a large hydrocarbon spill). These IPFs with potential impacts listed in **Table 2** are discussed below.

Impacts of DP Construction Vessel Presence, Marine Sound, and Lights

The DP construction vessel, as a floating structure in the deepwater environment, will act as a fish aggregating device (FAD). In oceanic waters, the FAD effect would be most pronounced for epipelagic fishes such as tunas, dolphin, billfishes, and jacks, which are commonly attracted to fixed and drifting surface structures (Holland, 1990, Higashi, 1994, Relini et al., 1994). Positive fish associations with offshore rigs and platforms in the Gulf of Mexico are well documented (Gallaway and Lewbel, 1982, Wilson et al., 2003, Wilson et al., 2006). The FAD effect could possibly enhance the feeding of epipelagic predators by attracting and concentrating smaller fish species. Noise from installation activities could potentially cause masking in fishes, thereby reducing their ability to hear biologically relevant sounds (Radford et al., 2014).

The only defined acoustic threshold levels for continuous noise are given by Popper et al. (2014) and apply only to species of fish with swim bladders that provide some hearing (pressure detection) function. Popper et al. (2014) estimated threshold levels of 170 dB re 1 µPa accumulated over a 48-hour period for onset of recoverable injury and 158 dB re 1 µPa accumulated over a 12-hour period for onset temporary auditory threshold shifts. However, no consistent behavioral thresholds for fish have been established (Hawkins and Popper, 2014). Noise may also influence fish behaviors, such as predator-avoidance, foraging, reproduction, and intraspecific interactions (Picciulin et al., 2010, Bruintjes and Radford, 2013, McLaughlin and Kunc, 2015, Nedelec et al., 2017). Fish aggregating is likely to occur to some degree due to the presence of the DP construction vessel, but the impacts would be limited in geographic scope and no population level impacts are expected.

Few data exist regarding the impacts of noise on pelagic larvae and eggs. Generally, it is believed that larval fish will have similar hearing sensitivities as adults, but may be more susceptible to barotrauma injuries associated with impulsive noise (Popper et al., 2014). Larval fish were experimentally exposed to simulated impulsive sounds by Bolle et al. (2012). The controlled playbacks produced cumulative exposures of 206 dB re 1 $\mu Pa^2 \cdot s$ but resulted in no increased mortality between the exposure and control groups. Non-impulsive noise sources are expected to be far less injurious than impulsive noise. Based on transmission loss calculations (Urick, 1983), open water propagation of noise produced by typical sources with DP thrusters, are not expected to produce received levels greater than 160 dB re 1 µPa beyond 32 m (105 ft) from the source. Because of the limited propagation distances of produced high sound pressure levels in conjunction with the periodic and transient nature of ichthyoplankton, no impacts to these life stages are expected.

Impacts of Effluent Discharges

Treated sanitary and domestic wastes may have a slight effect on the pelagic environment in the immediate vicinity of these discharges. These wastes may have elevated levels of nutrients, organic matter, and chlorine, but should be diluted rapidly to undetectable levels within tens to hundreds of meters from the source. Minimal impacts on pelagic communities and ichthyoplankton are anticipated.

Deck drainage may have a slight effect on the pelagic environment in the immediate vicinity of these discharges. Deck drainage from contaminated areas will be passed through an oil-and-water separator prior to release, and discharges will be monitored for visible sheen. The discharges may have slightly elevated levels of hydrocarbons but should be diluted rapidly to undetectable levels within tens to hundreds of meters from the source. Minimal impacts on pelagic communities and ichthyoplankton are anticipated.

Other discharges in accordance with the NPDES permit, such as desalination unit brine and uncontaminated cooling water, fire water, and ballast water, are expected to be diluted rapidly and have little or no impact on water column biota.

Impacts of Water Intake

Seawater will be drawn from the ocean for once-through, non-contact cooling of machinery on the DP construction vessel. The intake of seawater for cooling water will entrain plankton. The low intake velocity should allow most strong-swimming juvenile fishes and smaller adults to escape entrainment or impingement (Electric Power Research Institute, 2000). However, drifting plankton would not be able to escape entrainment with the exception of a few fast-swimming larvae of certain taxonomic groups. Those organisms entrained may be stressed or killed (Cada, 1990, Mayhew et al., 2000), primarily through changes in water temperature during the route from cooling intake structure to discharge structure and mechanical damage (turbulence in pumps and condensers). Due to the limited scope and short duration of installation activities, any short-term impacts of entrainment are not expected to be biologically significant to plankton populations (BOEM, 2017a, b). The DP construction vessel ultimately chosen for this project is expected to be in compliance with all cooling water intake requirements.

Impacts of a Small Fuel Spill

Potential spill impacts on fisheries resources are discussed by BOEM (2017a, b). For this DOCD, there are no unique site-specific issues with respect to spill impacts.

The probability of a fuel spill is expected to be minimized by BP's preventative measures during routine operations, including fuel transfer. In the unlikely event of a spill, implementation of BP's OSRP is expected to mitigate the potential for impacts on pelagic communities, including ichthyoplankton. DOCD Section 9 provides detail on spill response measures. Given the open ocean location of the project area, the duration of a small spill and opportunity for impacts to occur would be very brief.

A small fuel spill in offshore waters would produce a slick on the water surface and increase the concentrations of petroleum hydrocarbons and their degradation products. The extent and persistence of impacts would depend on the meteorological and oceanographic conditions at the time and the effectiveness of spill response measures. **Section A.9.1** discusses the likely fate of a small fuel spill and indicates that over 90% is expected to be evaporated or dispersed naturally within 24 hours. The area of the sea surface with diesel fuel on it would range from 0.5 to 5 ha (1.2 to 12 ac), depending on sea state and weather conditions.

A small fuel spill could have localized impacts on pelagic communities and ichthyoplankton. Due to the limited areal extent and short duration of water quality impacts, a small fuel spill would be unlikely to produce detectable impacts.

Impacts of a Large Hydrocarbon Spill

Potential spill impacts on pelagic communities and ichthyoplankton are discussed by BOEM (2017a). A large hydrocarbon spill could affect water column pelagic communities including phytoplankton, zooplankton, ichthyoplankton, and nekton. While adult and juvenile fishes may actively avoid a large spill, planktonic eggs and larvae would be unable to avoid contact with oil. Eggs and larvae of fishes are especially vulnerable to oiling because they inhabit the upper layers of the water column, and they will die if exposed to certain toxic fractions of spilled oil. Impacts potentially would be greater if local-scale currents retained planktonic larval assemblages (and the floating oil slick) within the same water mass. Impacts to ichthyoplankton from a large spill would be greatest during spring and summer when shelf concentrations peak (BOEM, 2016b).

C.5.2 Essential Fish Habitat

Essential Fish Habitat (EFH) is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, and growth to maturity. Under the Magnuson-Stevens Fishery Conservation and Management Act, as amended, federal agencies are required to consult on activities that may adversely affect EFH designated in Fishery Management Plans developed by the regional Fishery Management Councils.

The Gulf of Mexico Fishery Management Council (GMFMC) has prepared Fishery Management Plans for corals and coral reefs, shrimps, spiny lobster, reef fishes, coastal migratory pelagic fishes, and red drum. In 2005, the EFH for these managed species was redefined in Generic Amendment No. 3 to the various Fishery Management Plans (Gulf of Mexico Fishery Management Council, 2005). The EFH for most of these GMFMC-managed species is on the continental shelf in waters shallower than 183 m (600 ft). The shelf edge is the outer boundary for coastal migratory pelagic fishes, reef fishes, and shrimps. EFH for corals and coral reefs includes some shelf-edge topographic features on the Texas-Louisiana OCS located approximately 44 statute miles (71 km) north of the project area (**Figure 3**).

Highly migratory pelagic fishes, which occur as transients in the project area, are the only remaining group for which EFH has been identified in the deepwater Gulf of Mexico. Species in this group, including tunas, swordfishes, billfishes, and sharks, are managed by NMFS. **Table 8** lists the highly migratory fish species and their life stages with EFH at or near the project area.

Table 8. Migratory fish species with designated Essential Fish Habitat (EFH) at or near Mississippi Canyon Block 562, including life stage(s) potentially present within the project area (Adapted from National Marine Fisheries Service [NMFS], 2009b).

Common Name	Scientific Name	Life Stage(s) Potentially Present Within or Near the Project Area
Atlantic bluefin tuna	*Thunnus thynnus*	Spawning, eggs, larvae, adults
Bigeye tuna	*Thunnus obesus*	Juveniles, adults
Bigeye thresher shark	*Alopias superciliosus*	All
Blue marlin	*Makaira nigricans*	Juveniles, adults
Longbill spearfish	*Tetrapturus pfluegeri*	Juveniles, adults
Longfin mako shark	*Isurus paucus*	All
Oceanic whitetip shark	*Carcharhinus longimanus*	All
Skipjack tuna	*Katsuwonus pelamis*	Spawning
Swordfish	*Xiphias gladius*	Larvae, juveniles, adults

Table 8. (Continued).

Common Name	Scientific Name	Life Stage(s) Potentially Present Within or Near the Project Area
Whale shark	*Rhincodon typus*	All
White marlin	*Tetrapturus albidus*	Juveniles, adults
Yellowfin tuna	*Thunnus albacares*	Spawning, juveniles, adults

Research indicates the central and western Gulf of Mexico may be important spawning habitat for Atlantic bluefin tuna (*Thunnus thynnus*), and (NMFS, 2009b) has designated a Habitat Area of Particular Concern (HAPC) for this species. The HAPC covers much of the deepwater Gulf of Mexico, including the project area (**Figure 3**). The areal extent of the HAPC is approximately 115,830 mi^2 (300,000 km^2). The prevailing assumption is that Atlantic bluefin tuna follow an annual cycle of foraging in June through March off the eastern U.S. and Canadian coasts, followed by migration to the Gulf of Mexico to spawn in April, May, and June (NMFS, 2009b). The Atlantic bluefin tuna has also been designated as a species of concern (NMFS, 2011). An amendment to the original EFH Generic Amendment was finalized in 2005 (Gulf of Mexico Fishery Management Council, 2005). One of the most significant changes in this amendment reduced the extent of EFH relative to the 1998 Generic Amendment by removing the EFH description and identification from waters between 100 fathoms and the seaward limit of the Exclusive Economic Zone. The Highly Migratory Species Fisheries Management Plan was amended in 2009 to update EFH and HAPC to include the bluefin tuna spawning area (NMFS, 2009b).

NTLs 2009-G39 and 2009-G40 that provide guidance and clarification of the regulations with respect to biologically sensitive underwater features and areas and benthic communities that are considered EFH. As part of an agreement between BOEM and NMFS to complete a new programmatic EFH consultation for each new Five-Year Program, an EFH consultation was initiated between BOEM's Gulf of Mexico Region and NOAA's Southeastern Region during the preparation, distribution, and review of BOEM's 2017-2022 Multisale EIS (BOEM, 2017a). The EFH assessment was completed and there is ongoing coordination among NMFS, BOEM, and BSEE, including discussions of mitigation to prevent impact on highly migratory species from oil and gas activities (BOEM, 2016c).

Other HAPCs have been identified by the Gulf of Mexico Fishery Management Council (2005). These include the Florida Middle Grounds, Madison-Swanson Marine Reserve, Tortugas North and South Ecological Reserves, Pulley Ridge, and several individual reefs and banks of the northwestern Gulf of Mexico. Madison Swanson Marine Reserve is the HAPC located nearest to the project area (approximately 153 statute miles [246 km]).

IPFs that potentially may affect EFH include DP construction vessel presence, marine sound, and lights; effluent discharges; water intake; and two types of accidents (a small fuel spill and a large hydrocarbon spill).

Impacts of DP Construction Vessel Presence, Underwater Sound, and Lights

The DP construction vessel, as a floating structure in the deepwater environment, will act as an FAD. In oceanic waters, the FAD effect would be most pronounced for epipelagic fishes such as tunas, dolphin, billfishes, and jacks, which are commonly attracted to fixed and drifting surface

structures (Holland, 1990, Higashi, 1994, Relini et al., 1994). The FAD effect would possibly enhance feeding of epipelagic predators by attracting and concentrating smaller fish species.

Vessel noise could potentially cause acoustic masking for fishes, thereby reducing their ability to hear biologically relevant sounds (Radford et al., 2014). Noise may also influence fish behaviors such as predator avoidance, foraging, reproduction, and intraspecific interactions (Picciulin et al., 2010, Bruintjes and Radford, 2013, McLaughlin and Kunc, 2015, Nedelec et al., 2017). Because the presence of the DP construction vessel is temporary and short propagation distances of high sound pressure levels, any impacts to EFH for highly migratory pelagic fishes are considered minor.

Impacts of Effluent Discharges

Other effluent discharges affecting EFH by diminishing ambient water quality include treated sanitary and domestic wastes, deck drainage, and miscellaneous discharges such as desalination unit brine and uncontaminated cooling water, fire water, and ballast water. Impacts on water quality have been discussed previously. No significant impacts on EFH for highly migratory pelagic fishes are expected from these discharges.

Impacts of Water Intake

As noted previously, cooling water intake will cause entrainment and impingement of plankton, including fish eggs and larvae (ichthyoplankton). Due to the limited scope and short duration of installation activities, any short-term impacts on EFH for highly migratory pelagic fishes are not expected to be biologically significant. The recent lease sale EIS (BOEM, 2017a) discusses impacts from cooling water discharge. Water with an elevated temperature may accumulate around the discharge pipe. However, the warmer water should be diluted rapidly to ambient temperature levels within 100 m (328 ft) of the discharge pipe. Any impacts to pelagic species (e.g., *Sargassum* spp.) would be extremely localized and brief (BOEM, 2014).

Impacts of a Small Fuel Spill

Potential spill impacts on EFH are discussed by BOEM (2017a). For this DOCD, there are no unique site-specific issues with respect to spill impacts.

The probability of a fuel spill is expected to be minimized by BP's preventative measures during routine operations, including fuel transfer. In the unlikely event of a spill, implementation of BP's OSRP is expected to help diminish the potential for impacts on EFH. Section 9 provides detail on spill response measures. Given the open ocean location of the project area, the duration of a small spill and opportunity for impacts to occur would be very brief.

A small fuel spill in offshore waters would produce a slick on the water surface and increase the concentrations of petroleum hydrocarbons and their degradation products. The extent and persistence of impacts would depend on the meteorological and oceanographic conditions at the time and the effectiveness of spill response measures. **Section A.9.1** discusses the likely fate of a small fuel spill and indicates that over 90% is expected to be evaporated or dispersed naturally within 24 hours. The area of the sea surface with diesel fuel on it would range from 0.5 to 5 ha (1.2 to 12 ac), depending on sea state and weather conditions.

A small fuel spill could have localized impacts on EFH for highly migratory pelagic fishes, including tunas, swordfishes, billfishes, and sharks. These species occur as transients in the project area. A spill would produce short-term impact on water quality in a small portion of the HAPC for spawning bluefin tuna, which covers approximately 115,830 miles^2 (300,000 km^2) of the deepwater Gulf of Mexico.

A small fuel spill would likely not affect EFH for corals and coral reefs, the nearest EFH being the topographic features located approximately 44 statute miles (71 km) north of the project area. A small fuel spill would float and dissipate on the sea surface and would not contact these features.

Impacts of a Large Hydrocarbon Spill

Potential spill impacts on EFH are discussed by BOEM (2017a). For this DOCD, there are no unique site-specific issues with respect to EFH.

A spill in offshore waters would temporarily increase hydrocarbon concentrations on the water surface. Given the extent of EFH designations in the Gulf of Mexico (Gulf of Mexico Fishery Management Council, 2005, NMFS, 2009b), some impact on EFH would likely occur.

A large spill could affect EFH for many managed species including shrimps, stone crab, spiny lobster, reef fishes, coastal migratory pelagic fishes, and red drum. It would result in adverse impacts on water quality and water column biota including phytoplankton, zooplankton, and nekton. In coastal waters, sediments could be contaminated and result in persistent degradation of the seafloor habitat for managed demersal fish and shellfish species.

The project area is within the HAPC for spawning Atlantic bluefin tuna (NMFS, 2009b). A large spill could temporarily degrade the HAPC due to increased hydrocarbon concentrations in the water column, with the potential for lethal or sublethal impacts on spawning tuna. Potential impacts would depend in part on the timing of a spill, as this species migrates to the Gulf of Mexico to spawn in April, May, and June (NMFS, 2009b).

The topographic features located 44 statute miles (71 km) north of the project area are designated as EFH under the corals and coral reefs management plan (Gulf of Mexico Fishery Management Council, 2005). An accidental spill would be unlikely to affect this area, since a surface slick would be unlikely to reach these features due to their depth.

C.6 Archaeological Resources

C.6.1 Shipwreck Sites

MC 562 is on the list of archaeology survey blocks with a high potential for historic shipwrecks (BOEM, 2011). The archeological assessment identified no archaeologically significant artifacts or shipwrecks within 610 m (2,000 ft) of the location of the proposed activities based on an autonomous underwater vehicle survey (BP, 2018). It is expected that BP will abide by the applicable requirements of NTL 2005-G07 and 30 CFR 550.194(c), which stipulate that work be stopped at the project site if any previously undetected archaeological resource is discovered after work has begun until appropriate surveys and evaluations have been completed.

Because there are no shipwreck sites within 610 m (2,000 ft) of the location of the proposed activities, there are no routine IPFs that are likely to affect shipwrecks. Impacts of a large hydrocarbon spill is the only IPF considered. A small fuel spill would not affect shipwrecks because the diesel fuel would float and dissipate on the sea surface.

Impacts of a Large Hydrocarbon Spill

Because there are no historic shipwrecks within a 300-m (984-ft) radius of the location of the proposed activities and the WCD for the proposed activities consists of a surface spill of diesel fuel and not a seafloor blowout, impacts from dispersed sediments would not be relevant. Should there be any indication that potential shipwreck sites could be affected, in accordance with NTL 2005-G07, BP will immediately halt project operations, take steps to ensure that the site is not disturbed in any way, and contact the BOEM Regional Supervisor, Leasing and Environment, within 48 hours of its discovery. BP would cease all operations within 305 m (1,000 ft) of the site until the Regional Supervisor provides instructions on steps to take to assess the site's potential historic significance and protect it.

There is the potential for impacts from diesel fuel and depleted oxygen levels. These impacts could include chemical contamination as well as alteration of the rates of microbial activity (BOEM, 2017a, b). A spill entering shallow coastal waters could conceivably contaminate an undiscovered shipwreck site. Based on the 30-day OSRA modeling (**Table 4**), Plaquemines and Lafourche Parishes may be affected within 10 days of a spill and coastal areas between Cameron Parish, Louisiana, and Bay County, Florida, may be affected within 30 days (1% to 11% conditional probability). Based on the 60-day OSRA modeling estimates (**Table 5**), the potential shoreline contacts range from Matagorda County, Texas, to Levy County, Florida (up to 24% conditional probability). If an oil spill contacted a coastal historic site, such as a fort or a lighthouse, the impacts may be temporary and reversible (BOEM, 2017a).

C.6.2 Prehistoric Archaeological Sites

With a water depth of approximately 1,962 m (6,436 ft), the location of the proposed activities is well beyond the 60-m (197-ft) depth contour used by BOEM as the seaward extent for potential prehistoric archaeological sites in the Gulf of Mexico. Because prehistoric archaeological sites are not found in the project area, the only relevant IPF is a large hydrocarbon spill. A small fuel spill would not affect prehistoric archaeological resources because the oil would float and dissipate on the sea surface.

Impacts of a Large Hydrocarbon Spill

Along the northern Gulf Coast, prehistoric sites exist along the barrier islands and mainland coast and along the margins of bays and bayous (BOEM, 2017a). Based on the 30-day OSRA modeling (**Table 4**), Plaquemines and Lafourche Parishes may be affected within 10 days of a spill and coastal areas between Cameron Parish, Louisiana, and Bay County, Florida, may be affected within 30 days (1% to 11% conditional probability). Based on the 60-day OSRA modeling estimates (**Table 5**), the potential shoreline contacts range from Matagorda County, Texas, to Levy County, Florida (up to 24% conditional probability). If a spill did reach a prehistoric site along these shorelines, it could coat fragile artifacts or site features and compromise the potential for radiocarbon dating organic materials in a site (although other dating methods are available and it is possible to decontaminate an oiled sample for radiocarbon dating). Coastal

prehistoric sites could also be damaged by spill cleanup operations (e.g., by destroying fragile artifacts and disturbing the provenance of artifacts and site features).

C.7 Coastal Habitats and Protected Areas

Coastal habitats in the northeastern Gulf of Mexico that may be affected by oil and gas activities are described by BOEM (2017a, b). Coastal habitats inshore of the project area include barrier beaches and dunes, wetlands, oyster reefs and submerged seagrass beds. Generally, most of the northeastern Gulf is fringed by barrier beaches, with wetlands, oyster reefs and/or submerged seagrass beds occurring in sheltered areas behind the barrier islands and in estuaries.

Due to the distance from shore, the only IPF associated with routine activities in the project area that potentially may affect beaches and dunes, wetlands, oyster reefs, seagrass beds, coastal wildlife refuges, wilderness areas, or any other managed or protected coastal area is support vessel traffic. The support bases at Port Fourchon and Houma, Louisiana, are not in wildlife refuges or wilderness areas. Potential impacts of support vessel traffic are addressed briefly below.

Impacts of support vessel traffic and a large hydrocarbon spill are the only IPFs analyzed. A small fuel spill in the project area would be unlikely to affect coastal habitats, as the project area is 64 statute miles (103 km) from the nearest shoreline (Louisiana). As explained in **Section A.9.1**, a small fuel spill would not be expected to make landfall or reach coastal waters prior to breaking up. These IPFs with potential impacts listed in **Table 2** are discussed below.

Impacts of Support Vessel Traffic

Support operations, including crew boats and supply boats as detailed in DOCD Section 13, may have a minor incremental impact on barrier beaches and dunes, wetlands, oyster reefs, and protected areas. Over time, with a large number of vessel trips, vessel wakes can erode shorelines along inlets, channels, and harbors, resulting in localized land loss. Impacts to barrier beaches and dunes, wetlands, oyster reefs and protected areas will be minimized by following the speed and wake restrictions in harbors and channels.

Support operations, including crew boats and supply boats are not anticipated to have a significant impact on submerged seagrass beds. While submerged seagrass beds could be uprooted, scarred, or lost due to direct contact from vessels, use of navigation channels and adherence to local requirements and implemented programs will decrease the likelihood of impacts to these resources (BOEM, 2017a, b).

Impacts of a Large Hydrocarbon Spill

Potential spill impacts on coastal habitats are discussed by BOEM (2017a, b). Coastal habitats inshore of the project area include barrier beaches and dunes, wetlands, oyster reefs, and submerged seagrass beds. For this DOCD, there are no unique site-specific issues with respect to coastal habitats.

The 30-day OSRA modeling (**Table 4**) indicates that Plaquemines Parish, Louisiana, with an 11% conditional probability, is the coastal area most likely to be contacted within 30 days of a spill. The 60-day OSRA (**Table 5**) predicts potential shoreline contact ranging from Matagorda County, Texas, to Levy County, Florida, within 60 days of a spill. The shorelines within the geographic range predicted by the OSRA modeling (**Tables 4** and **5**) include extensive barrier

beaches and wetlands, oyster reefs with submerged seagrass beds occurring in sheltered areas behind the barrier islands and in estuaries. NWRs and other protected areas along the coast are discussed in BOEM (2017a, b) and BP's OSRP. Coastal and near-coastal wildlife refuges, wilderness areas, and state and national parks within the geographic range of the potential shoreline contacts based on the 30-day OSRA model (**Table 4**) are presented in **Table 9**.

The level of impacts from hydrocarbon spills on coastal habitats depends on many factors, including the oil characteristics, the geographic location of the landfall, and the weather and oceanographic conditions at the time (BOEM, 2017a, b, c).

Table 9. Wildlife refuges, wilderness areas, and state and national parks within the geographic range of the potential shoreline contacts after 30 days of a hypothetical spill from Launch Area 59 based on the 30-day Oil Spill Risk Analysis model.

County or Parish, State	Wildlife Refuge, Wilderness Area, or State/National Park
Cameron, Louisiana	Sabine National Wildlife Refuge
	Rockefeller State Wildlife Refuge and Game Preserve
	Peveto Woods Sanctuary
Vermilion, Louisiana	Paul J. Rainey Wildlife Refuge and Game Preserve
	Rockefeller State Wildlife Refuge and Game Preserve
	State Wildlife Refuge
Terrebonne, Louisiana	Isles Dernieres Barrier Islands Refuge
	Pointe aux Chenes Wildlife Management Area
Lafourche, Louisiana	East Timbalier Island National Wildlife Refuge
	Pointe aux Chenes Wildlife Management Area
	Wisner Wildlife Management Area (Includes Picciola Tract)
Jefferson, Louisiana	Grand Isle State Park
Plaquemines, Louisiana	Breton National Wildlife Refuge
	Delta National Wildlife Refuge
	Pass a Loutre Wildlife Management Area
St. Bernard, Louisiana	Biloxi Wildlife Management Area
	Breton National Wildlife Refuge
	Saint Bernard State Park
Walton, Florida	Choctawhatchee River Delta Preserve
	Choctawhatchee River Water Management Area
	Deer Lake State Park
	Grayton Beach State Park
	Point Washington State Forest
	Topsail Hill Preserve State Park
Bay, Florida	Camp Helen State Park
	SS Tarpon Underwater Archaeological Preserve
	St. Andrews Aquatic Preserve
	St. Andrews State Park
	Vamar Underwater Archaeological Preserve

Coastal wetlands are highly sensitive to oiling and can be significantly affected because of the inherent toxicity of hydrocarbon and non-hydrocarbon components of the spilled substances (Beazley et al., 2012, Lin and Mendelssohn, 2012, Mendelssohn et al., 2012). Numerous variables such as oil concentration and chemical composition, vegetation type and density, season or weather, preexisting stress levels, soil types, and water levels may influence the impacts of oil exposure on wetlands. Light oiling could cause plant die back, followed by

recovery in a fairly short time. Vegetation exposed to oil that persists in wetlands could take years to recover (BOEM, 2017a, b). In addition to the direct impacts of oil, cleanup activities in marshes may accelerate rates of erosion and retard recovery rates (BOEM, 2017a). Impacts associated with an extensive oiling of coastal wetland habitat from a large hydrocarbon spill may be significant.

C.8 Socioeconomic and Other Resources

C.8.1 Recreational and Commercial Fishing

Potential impacts to recreational and commercial fishing are analyzed by BOEM (2017a, b). The main commercial fishing activity in deep waters of the northern Gulf of Mexico is pelagic longlining for tunas, swordfishes, and other billfishes (Continental Shelf Associates, 2002). Pelagic longlining has occurred historically in the project area, primarily during spring and summer. In August 2000, the federal government closed two areas in the northeastern Gulf of Mexico to longline fishing (65 FR 47214). The lease is outside of the closure areas.

Longline gear consists of monofilament line deployed from a moving vessel and generally allowed to drift for 4 to 5 hours (Continental Shelf Associates, 2002). As the mainline is put out, baited leaders and buoys are clipped in place at regular intervals. It takes 8 to 10 hours to deploy a longline and about the same time to retrieve it. Longlines are often set near oceanographic features such as fronts or downwellings, with the aid of sophisticated on-board temperature sensors, depth finders, and positioning equipment. Vessels typically are 10 to 30 m (33 to 98 ft) long, and their trips last from about 1 to 3 weeks.

It is unlikely that any commercial fishing activity other than longlining occurs at or near the project area. Benthic species targeted by commercial fishers occur on the upper continental slope, well inshore of the project area. Royal red shrimp (*Pleoticus robustus*) are caught by trawlers in water depths of about 250 to 550 m (820 to 1,804 ft). Tilefishes (primarily *Lopholatilus chamaeleonticeps*) are caught by bottom longlining in water depths from about 165 to 450 m (540 to 1,476 ft) (Continental Shelf Associates, 2002).

Most recreational fishing activity in the region occurs in water depths less than 200 m (656 ft) (Continental Shelf Associates, 1997, 2002). In deeper water, the main attraction to recreational fishers would be petroleum platforms offshore Texas and Louisiana. Due to the distance from shore, it is unlikely that recreational fishing activity is occurring in the project area.

The only routine IPF that potentially may affect fisheries is DP construction vessel (including marine sound and lights). Two types of potential accidents are also addressed below (a small fuel spill and a large hydrocarbon spill). These IPFs with potential impacts listed in **Table 2** are discussed below.

Impacts of DP Construction Vessel Presence, Marine Sound, and Lights

There is a slight possibility of pelagic longlines becoming entangled in the DP construction vessel. For example, in January 1999, a portion of a pelagic longline snagged on the acoustic Doppler current profiler of a drillship working in the Gulf of Mexico (Continental Shelf Associates, 2002). The line was removed without incident. Generally, longline fishers use radar and are aware of offshore structures and ships when placing their sets. Therefore, little or no impact on pelagic longlining is expected from the proposed project.

Because it is unlikely that any recreational fishing activity is occurring in the project area, no adverse impacts are anticipated. Other factors such as effluent discharges are likely to have negligible impacts on commercial or recreational fisheries due to rapid dispersion, the small area of ocean affected, and the intermittent nature of the discharges.

Impacts of a Small Fuel Spill

The probability of a fuel spill is expected to be minimized by BP's preventative measures during routine operations, including fuel transfer. In the unlikely event of a spill, implementation of BP's OSRP is expected to potentially mitigate and reduce the potential for impacts. DOCD Section 9 provides detail on spill response measures. Given the open ocean location of the project area, the duration of a small spill and opportunity for impacts to occur would be very brief.

Pelagic longlining activities in the project area, if any, could be interrupted in the event of a small fuel spill. The area of the sea surface with diesel fuel on it would range from 0.5 to 5 ha (1.2 to 12 ac), depending on sea state and weather conditions (see **Section A.9.1**). Fishing activities could be interrupted due to the activities of response vessels operating in the project area. A small fuel spill would not affect coastal water quality because the spill would not be expected to make landfall or reach coastal waters prior to breaking up (see **Section A.9.1**).

Impacts of a Large Hydrocarbon Spill

Potential spill impacts on fishing activities are discussed by BOEM (2017a, b). For this DOCD, there are no unique site-specific issues with respect to this activity.

Pelagic longlining activities in the project area and other fishing activities in the northern Gulf of Mexico would not likely be interrupted in the event of a large hydrocarbon spill because most of the diesel fuel is expected to quickly evaporate or dissipate.

Fish populations may be affected by a spill event should it occur, but they would be primarily affected if the hydrocarbons reaches the productive shelf and estuarine areas where many fishes spend a portion of their life cycle (BOEM, 2012a). The probability of an offshore spill affecting these nearshore environments is low. Should a large hydrocarbon spill occur, economic impacts on commercial and recreational fishing activities would likely occur, but are difficult to predict because impacts would differ by fishery and season (BOEM, 2016b).

C.8.2 Public Health and Safety

There are no IPFs associated with routine operations that are expected to affect public health and safety. Impacts of a small fuel spill and a large hydrocarbon spill are addressed below. A small fuel spill would be unlikely to cause any impacts on public health and safety because it would affect only a small area of the open ocean 64 statute miles (103 km) from the nearest shoreline, and nearly all of the diesel fuel would evaporate or disperse within 24 hours (see **Section A.9.1**).

Impacts of a Large Hydrocarbon Spill

In the event of a large fuel spill, the main safety and health concerns are those of the offshore personnel involved in the incident and those responding to the spill. Once released into the water column, diesel fuel evaporates and dissipates rapidly. Depending on many factors such as

spill rate, duration, and location, the physical/chemical characteristics of the oil, meteorological, and oceanographic conditions at the time, and the effectiveness of spill response measures, diesel may remain present on the sea surface and reach coastal shorelines.

C.8.3 Employment and Infrastructure

There are no IPFs associated with routine operations that are expected to affect employment and infrastructure. The project involves infrastructure installation with support from existing shorebase facilities in Louisiana. No new or expanded facilities will be constructed, and no new employees are expected to move permanently into the area. The project will have a negligible impact on socioeconomic conditions such as local employment, existing offshore and coastal infrastructure (including major sources of supplies, services, energy, and water), and minority and lower income groups. Impacts of a large hydrocarbon spill are addressed below. A small fuel spill that dissipates within a few days would have little or no economic impact as the spill response would use existing facilities, resources, and personnel.

Impacts of a Large Hydrocarbon Spill

Potential socioeconomic impacts of an oil spill are discussed by BOEM (2017a, b). For this DOCD, there are no unique site-specific issues with respect to employment and coastal infrastructure. A large spill could cause economic impacts in several ways: it could result in fishery closures that could temporarily put fishermen out of work; it could result in temporary employment as part of the response effort (including the establishment of spill response staging areas); or it could result in adverse publicity that affects employment in coastal recreation and tourism industries. However, due to the distance from shore and the limited size of any potential large fuel spill, impacts on employment and infrastructure are not anticipated.

C.8.4 Recreation and Tourism

There are no known recreational uses of the project area. Recreational resources and tourism in coastal areas would not be affected by any routine activities due to the distance from shore. Compliance with NTL BSEE-2015-G03 is expected to minimize the chance of trash or debris being lost overboard from the DP construction vessel and subsequently washing up on beaches. A small fuel spill in the project area would be unlikely to affect recreation and tourism because, as explained in **Section A.9.1**, it would not be expected to make landfall or reach coastal waters prior to dispersing naturally.

Impacts of a Large Hydrocarbon Spill

Potential impacts of an hydrocarbon spill on recreation and tourism are discussed by BOEM (2017a, b). For this DOCD, there are no unique site-specific issues with respect to these impacts.

Impacts on recreation and tourism would vary depending on the duration of the spill and its fate including the effectiveness of response measures. A large spill that reached coastal waters and shorelines could adversely affect recreation and tourism by contaminating beaches and wetlands, resulting in negative publicity that encourages people to stay away. The 30-day OSRA modeling (**Table 4**) indicates that Plaquemines Parish, Louisiana, is the area most likely to be contacted by oil from a spill. The 60-day OSRA (**Table 5**) predicts potential shoreline contact ranging from Matagorda County, Texas, to Levy County, Florida.

According to BOEM (2017a, b), should a spill occur and contact a beach area or other recreational resource, it could cause some disruption during the impact and cleanup phases of the spill.

C.8.5 Land Use

Land use along the northern Gulf coast is discussed by BOEM (2017a, b). There are no routine IPFs that potentially may affect land use. The project will use existing onshore support facilities in Louisiana. The land use at the existing shorebase sites is industrial. The project will not involve any new construction or changes to existing land use and; therefore, will not have any impacts. Levels of boat and helicopter traffic as well as demand for goods and services including scarce coastal resources, will represent a small fraction of the level of activity occurring at the shorebases.

A large hydrocarbon spill is the only relevant IPF. A small fuel spill would not have any impacts on land use, as the response would be staged out of existing shorebases and facilities.

Impacts of a Large Hydrocarbon Spill

The initial response for a large fuel spill would be staged out of existing facilities, with no effect on land use. A large spill could have limited temporary impacts on land use along the coast if additional staging areas were needed.

An accidental spill is not likely to significantly affect land use and coastal infrastructure in the region, in part because an offshore spill would have a small probability of contacting onshore resources.

C.8.6 Other Marine Uses

The closest existing infrastructure to the location proposed subsea tie-in is an infield oil flowline approximately 23 m (80 ft) to the northwest, the Isabela PLEM 2 approximately 27 m (90 ft) to the northwest, the Isabela flowline jumper approximately 30m (100 ft) to the west, and the existing MC 562-1 wellhead approximately 58 m (190 ft) to the northwest (BP, 2018). The archaeological survey as summarized in BP (2018) reported no archaeologically significant sonar contacts were identified within 610 m (2,000 ft) of the location of the proposed activities. There are no IPFs from routine project activities that are likely to affect other marine uses of the project area. A large hydrocarbon spill is the only relevant accident IPF. A small fuel spill would not have any impacts on other marine uses because spill response activities would be mainly within the project area and the duration would be brief.

Impacts of a Large Hydrocarbon Spill

A large fuel spill would be unlikely to significantly affect shipping or other marine uses. MC 562 is not located within any USCG-designated fairway, shipping lane, or Military Warning Area. In the event of a large spill requiring response vessels, coordination would be required to manage the vessel traffic for safe operations. BP intends to comply with BOEM requirements and lease stipulations to avoid impacts on uses of the area by military vessels and aircraft.

In the event of a large spill requiring numerous vessels in the area, coordination would be required to ensure that no anchoring or seafloor-disturbing activities occur near the existing infrastructure.

C.9 Cumulative Impacts

For purposes of the National Environmental Policy Act, a cumulative impact is defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7). Any single activity or action may have a negligible impact(s) by itself, but when combined with impacts from other activities in the same area and/or time period, substantial impacts may result.

Prior Studies. BOEM prepared a multi-lease sale EIS in which it analyzed the environmental impact of activities that might occur in the multi-lease sale area. The level and types of activities planned in BP's DOCD are within the range of activities described and evaluated by BOEM in the 2017 to 2022 Programmatic EIS for the Outer Continental Shelf (OCS) Oil and Gas Leasing Program (BOEM, 2016a), and the Final Programmatic EIS for Gulf of Mexico OCS Oil and Gas Lease Sales 2017-2022 (BOEM, 2017a). Past, present, and reasonably foreseeable activities were identified in the cumulative effects scenario of these documents, which are incorporated by reference. The proposed action should not result in any additional impacts beyond those evaluated in the multi-lease sale and Final EISs (BOEM, 2012a, 2013, 2014, 2015, 2016b, 2017a, b).

Description of Activities Reasonably Expected to Occur in the Vicinity of Project Area. Other exploration and development activities may occur in the vicinity of the project area. BP does not anticipate other projects in the vicinity of the project area beyond the types of projects analyzed in the lease sale and Supplemental EISs (BOEM, 2012a, 2013, 2014, 2015, 2016b, 2017a, b).

Cumulative Impacts of Activities in this DOCD. The BOEM (2017a) Final EIS included a discussion of cumulative impacts, which analyzed the environmental and socioeconomic impacts from the incremental impact of the 10 proposed lease sales, in addition to all activities (including non-OCS activities) projected to occur from past, proposed, and future lease sales. The EISs considered exploration, delineation, and development wells; platform installation; service vessel trips; and oil spills. The EISs examined the potential cumulative effects on each specific resource for the entire Gulf of Mexico.

The level and type of activity proposed in BP's DOCD are within the range of activities described and evaluated in the recent lease sale EISs. The EIA incorporates and builds on these analyses by examining the potential impacts on physical, biological, and socioeconomic resources from the work planned in this DOCD, in conjunction with the other reasonably foreseeable activities expected to occur in the Gulf of Mexico. Thus, for all impacts, the incremental contribution of BP's proposed actions to the cumulative impacts analysis in these prior analyses is not expected to be significant.

D. Environmental Hazards

D.1 Geologic Hazards

The site clearance letter provided by BP concluded that the location of the proposed activities is generally favorable for the proposed activities (BP, 2018). See DOCD Section 3 for supporting geological and geophysical information.

D.2 Severe Weather

Under most circumstances, weather is not expected to have any effect on the proposed activities. Extreme weather, including high winds, strong currents, and large waves, was considered in the design criteria for the vessels selected for this project. High winds and limited visibility during a severe storm could disrupt support activities (vessel and helicopter traffic) and make it necessary to suspend some activities for safety reasons until the storm or weather event passes. BP has several contingency plans in place to address unexpected conditions. In the event of severe weather, guidance as outlined in BP's and/or BP's installation contractor's site specific EEP, its site specific hurricane preparation checklist and Gulf of Mexico Region Severe Weather Contingency Plan would be adhered to.

D.3 Currents and Waves

Metocean conditions such as sea states, wind speed, ocean currents, etc. will be continuously monitored. Under most circumstances, physical oceanographic conditions are not expected to have any effect on the proposed activities. Strong currents (e.g., caused by Loop Current eddies and intrusions) and large waves were considered in the design criteria for the vessels selected for this project. High waves during a severe storm could disrupt support activities (i.e., vessel and helicopter traffic), and risks to the program brought on by such conditions would be closely monitored and managed by the team managing the project. In some cases, it may be necessary to suspend some activities on for safety reasons until the storm or weather event passes.

E. Alternatives

No formal alternatives were evaluated in the EIA for the proposed project. However, various technical and operational options, including the selection of the DP construction vessel, were considered by BP. The activity being proposed is the result of a rigorous screening and right-scoping process. It was selected as the best design candidate to reduce risk and optimize deliverability, chosen from numerous options with varying well locations, trajectories, and construction designs, amongst other variables.

F. Mitigation Measures

The proposed project includes numerous processes and actions that are required by laws, regulations, and BOEM lease stipulations and NTLs to mitigate potential impact to the environment. The project is intended to comply with all applicable federal, state, and local requirements concerning air pollutant emissions, discharges to water, and waste management. BP also has internal conformance requirements and standard operating procedures and practices that will be abided by. In addition, BP and its contractors intend to implement the following specific measures to prevent marine pollution:

- Proper job planning is an important overall mitigation measure. The fundamental concept and discussion in the pre-tour and pre-job safety meetings is the prevention of harm to people or the environment. Personnel are reminded daily to inspect work areas for potential pollution and safety issues.
- Per Safety and Environmental Management System requirements, the skills and knowledge of personnel are assessed prior to working offshore for BP.
- Preventive maintenance of vessel equipment and other service equipment, including visual inspection of hydraulic lines and reservoirs, will be conducted on a scheduled basis.
- Items deemed safety and environmentally critical are listed and managed on a schedule recommended by the manufacturer/operator.
- Waste generation and storage will be managed as per the BP Gulf of Mexico Waste Management procedures and/or the DP construction vessel contractor's established waste management procedures. Wastes are expected to be properly categorized, packaged, labeled, stored, manifested, and shipped to an appropriately permitted disposal site. Marine trash & debris mitigations are well implemented on BP assets.
- Drums will be stored in containment areas, and fuel vents will have containment boxes.
- Trash containers will be kept covered. Trash will be disposed of in a compactor and disposed of onshore.
- Tank overflow, discharge overflow spill prevention fittings as well as quick disconnect hoses will be installed on all hydrocarbon-based fluid hoses and liquid mud hoses to ensure isolation of any hose failures.
- On site spill kits are inspected regularly and re-stocked as needed.
- Drills are conducted regularly, engaging the Crisis and Continuity Management and Emergency Response Team onshore to measure the effectiveness and quality of processes deployed to address different emergency scenarios.

G. Consultation

No persons or agencies other than those listed as Preparers (**Section H**) were consulted during the preparation of the EIA.

H. Preparers

The EIA was prepared by CSA Ocean Sciences Inc. Contributors included:

- John M. Tiggelaar II (Project Scientist);
- Patrick Connelly (Project Scientist);
- Brent Gore (GIS/Remote Sensing Specialist); and
- Kristen L. Metzger (Library and Information Services Director).

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Appendix E: Air Emissions Information – Form BOEM-0139

DOCD AIR QUALITY SCREENING CHECKLIST

OMB Control No. 1010-0151
OMB Approval Expires: 06/30/2021

COMPANY	BP Exploration & Production Inc
AREA	Mississippi Canyon
BLOCK	562
LEASE	OCS-G 19966
PLATFORM	
WELL	002
COMPANY CONTACT	Donna Gyles (Air Quality)/ Adalberto Garcia (Plans)
TELEPHONE NO.	Donna Gyles (281-832-4985)/ Adalberto Garcia (281-995-2815)
REMARKS	Installing one (1) well jumper for Isabela 2 Project

LEASE TERM PIPELINE CONSTRUCTION INFORMATION:		
YEAR	NUMBER OF PIPELINES	TOTAL NUMBER OF CONSTRUCTION DAYS
2019		37

AIR EMISSIONS CUMPUTATION FACTORS

Fuel Usage Conversion Factors	Natural Gas Turbines		Natural Gas Engines		Diesel Recip. Engine		REF.	DATE
	SCF/hp-hr	9.524	SCF/hp-hr	7.143	GAL/hp-hr	0.0483	AP42 3.2-1	4/76 & 8/84

Equipment/Emission Factors	units	PM	SOx	NOx	VOC	CO	REF.	DATE
NG Turbines	gms/hp-hr		0.00247	1.3	0.01	0.83	AP42 3.2-1& 3.1-1	10/96
NG 2-cycle lean	gms/hp-hr		0.00185	10.9	0.43	1.5	AP42 3.2-1	10/96
NG 4-cycle lean	gms/hp-hr		0.00185	11.8	0.72	1.6	AP42 3.2-1	10/96
NG 4-cycle rich	gms/hp-hr		0.00185	10	0.14	8.6	AP42 3.2-1	10/96
Diesel Recip. < 600 hp.	gms/hp-hr	1	0.1835	14	1.12	3.03	AP42 3.3-1	10/96
Diesel Recip. > 600 hp.	gms/hp-hr	0.32	0.1835	11	0.33	2.4	AP42 3.4-1	10/96
Diesel Boiler	lbs/bbl	0.084	0.3025	0.84	0.008	0.21	AP42 1.3-12,14	9/98
NG Heaters/Boilers/Burners	lbs/mmscf	7.6	0.593	100	5.5	84	P42 1.4-1, 14-2, & 14	7/98
NG Flares	lbs/mmscf		0.593	71.4	60.3	388.5	AP42 11.5-1	9/91
Liquid Flaring	lbs/bbl	0.42	6.83	2	0.01	0.21	AP42 1.3-1 & 1.3-3	9/98
Tank Vapors	lbs/bbl				0.03		E&P Forum	1/93
Fugitives	lbs/hr/comp.				0.0005		API Study	12/93
Glycol Dehydrator Vent	lbs/mmscf				6.6		La. DEQ	1991
Gas Venting	lbs/scf				0.0034			

Sulphur Content Source	Value	Units
Fuel Gas	3.33	ppm
Diesel Fuel	0.05	% weight
Produced Gas(Flares)	3.33	ppm
Produced Oil (Liquid Flaring)	1	% weight

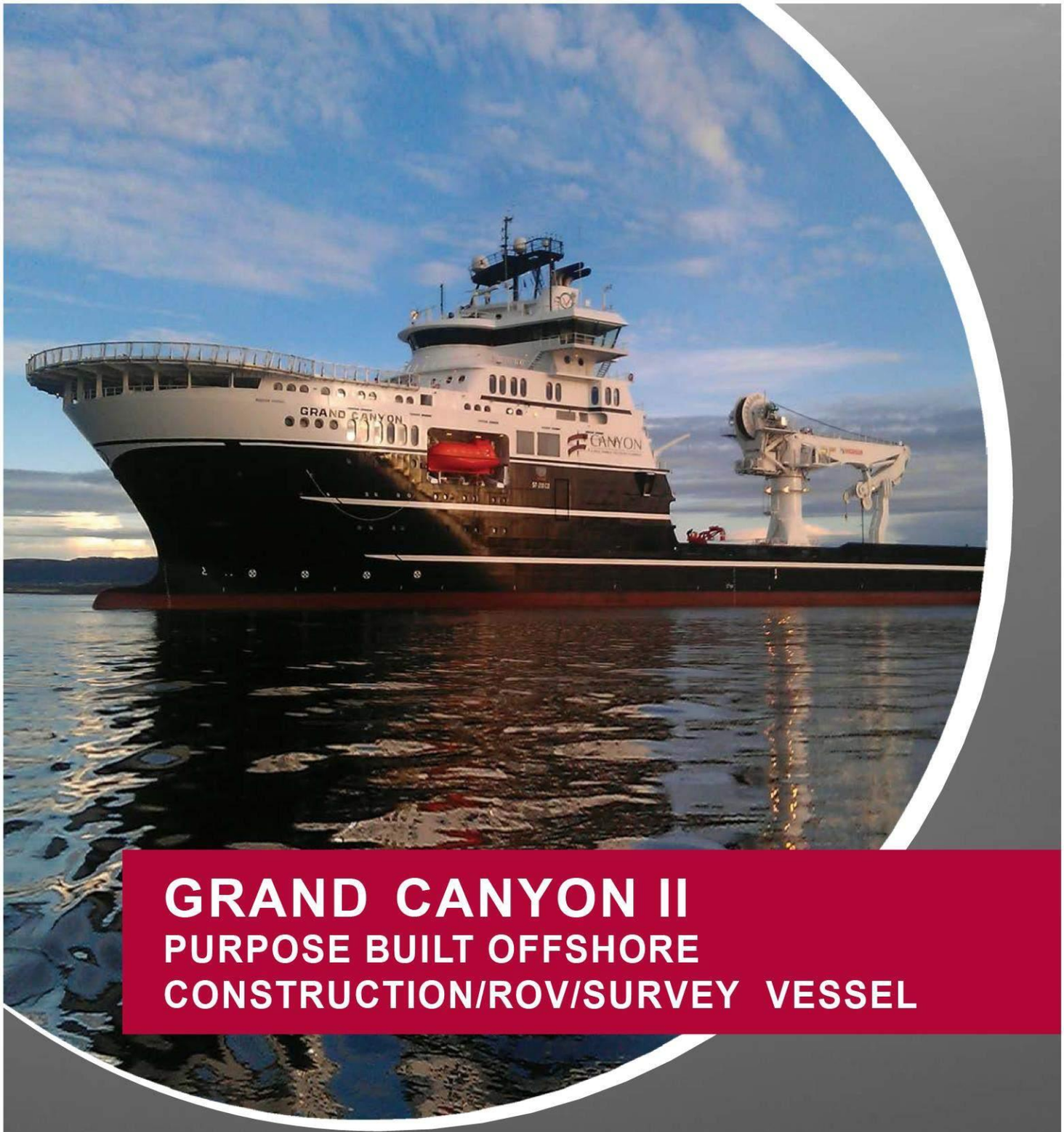
AIR EMISSIONS CALCULATIONS - FIRST YEAR

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL		CONTACT		PHONE	REMARKS					
BP Exploration & Production Inc	Mississippi Canyon	562	OCS-G 19966	0	002			Donna Gyles (Air Quality)/ Adalb	Donna Gyles (2	Installing one (1) well jumper for Isabela 2 Project					
OPERATIONS	**EQUIPMENT**	**RATING**	**MAX. FUEL**	**ACT. FUEL**	**RUN TIME**		**MAXIMUM POUNDS PER HOUR**					**ESTIMATED TONS**				
	Diesel Engines	**HP**	**GAL/HR**	**GAL/D**												
	Nat. Gas Engines	**HP**	**SCF/HR**	**SCF/D**												
	Burners	**MMBTU/HR**	**SCF/HR**	**SCF/D**	**HR/D**	**D/YR**	**PM**	**SOx**	**NOx**	**VOC**	**CO**	**PM**	**SOx**	**NOx**	**VOC**	**CO**
PIPELINE INSTALLATION																
Grand Canyon II:	**Average Daily Fuel Usage**			**5,812**												
	Maximum Daily Fuel Usage			**13,209**												
Grand Canyon II: 6 x 3000 kW (4023 hp) each	PRIME MOVER > 600hp Diesel	24138	1165.8654	27980.77	24	37	17.01	9.76	584.84	17.55	127.60	7.55	4.33	259.67	7.79	56.66
Small/Large auxiliary engines	AUXILIARY EQUIP<600hp diesel	2500	120.75	2898.00	24	37	5.51	1.01	77.09	6.17	16.69	2.44	0.45	34.23	2.74	7.41
Offshore Support Vessel 312 Class	VESSELS>600hp diesel(crew)	7200	347.76	8346.24	24	16	5.07	2.91	174.45	5.23	38.06	0.97	0.56	33.49	1.00	7.31
Offshore Support Vessel 312 Class	VESSELS>600hp diesel(supply)	7200	347.76	8346.24	24	16	5.07	2.91	174.45	5.23	38.06	0.97	0.56	33.49	1.00	7.31
2019 YEAR TOTAL							**32.67**	**16.59**	**1010.83**	**34.18**	**220.41**	**11.95**	**5.90**	**360.89**	**12.54**	**78.68**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**											**2144.52**	**2144.52**	**2144.52**	**2144.52**	**54626.43**
	64.4															

AIR EMISSIONS CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	PLATFORM	WELL
BP Exploration &	Mississippi Canyon	562	OCS-G 19966	0	002

Year	Emitted Substance				
	PM	SOx	NOx	VOC	CO
2019	11.95	5.90	360.89	12.54	78.68
Allowable	2144.52	2144.52	2144.52	2144.52	54626.43



GRAND CANYON II

PURPOSE BUILT OFFSHORE CONSTRUCTION/ROV/SURVEY VESSEL

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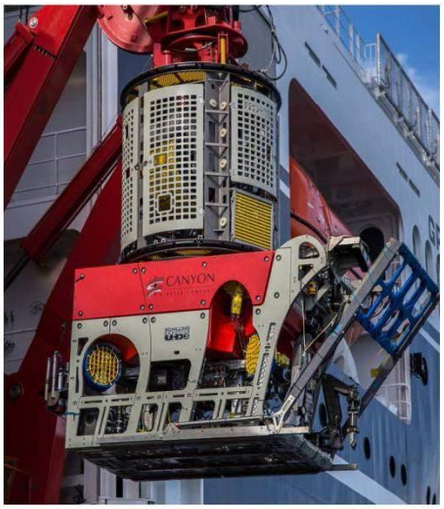
GRAND CANYON II

PURPOSE BUILT OFFSHORE CONSTRUCTION/ROV/SURVEY VESSEL



The *Grand Canyon II* is specially designed for operation under severe weather conditions with high maneuverability and station keeping capabilities.

Main Characteristics	
Length Overall	127.75 m
Length Between Particulars	114.60 m
Breadth Moulded	25.00 m
Depth to Main Deck	10.80 m
Maximum Draft	7.50 m
DWT at SWL / 7.3 m	Approximately 7,500 Te

Anti-rolling Tanks

One anti-rolling heeling system

Class

DnV + 1A1, E0, ICE C, DYNPOS AUTRO, SPS, CLEAN DESIGN, COMF-C3-V3, HELDK-SH, NAUT- OSV(A), CRANE, TMON, BIS

Main Propulsion Equipment

Diesel electric propulsion plant

Two nozzle propellers for main propulsion, output of 5.0 MW each

Deck Equipment

250 t AHC offshore crane with 3,000 m wire

1 auxiliary crane, starboard, 15 Te / 20 m

1 auxiliary crane for provision handling 2 Te / 18 m

4 tuggerwinches, each 10 Te

2 capstans, each 10 Te

Tunnel Thrusters / Azimuths

2 electric driven tunnel thrusters aft, each 2,000 kW

4 electric driven tunnel thrusters in bow, each 2,000 kW

Working Deck	
Moonpool	7.2m x 7.2m
Deck Area aft of Hangar	1,650 m

Helideck	
Rating	Skorsky 92
Rules	CAP437, DNV Class & NORSOK
Diameter Helideck	26.1m

Speed

Maximum speed at 6.0 m draft approximately 15.0 kn

Accommodation

104 men in single and double cabins

Messroom with self-serving area

4 lounges

Meeting rooms, offices, etc. on various decks

Helideck reception area

Hospital and recreation area

Wardrobes

Laundries

Cinema

ROVs and ROV Area

2 x 250hp UHD Gen III WROVs

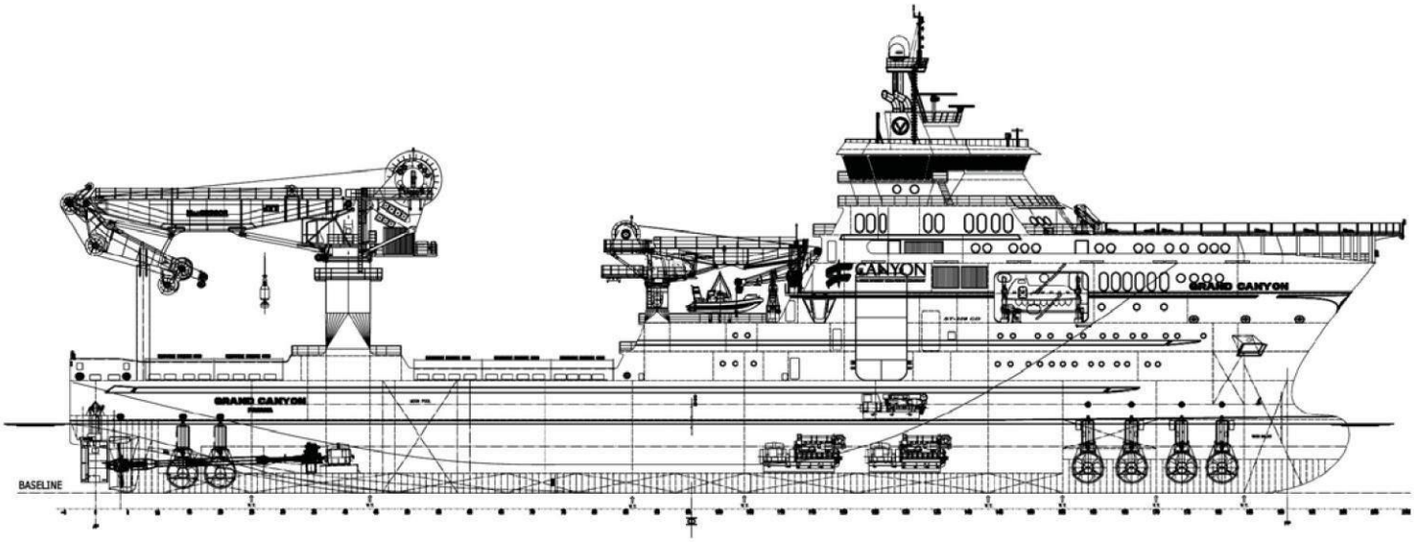
Hangar for port and starboard launching of WROV's

ROV workshop and maintenance area

Offices and meeting rooms for ROV operations

Online / offline rooms

Overhead crane in hangar 50 Te SWL



Dynamic Positioning System

Dual redundant dynamic positioning system (AUTRO / DP3)
2 Acoustic positioning units (HIPAP 500)
2 DGPS
Radius 1000
3 x MRUs
2 x tautwire winches / A-frames

Navigation and Radio Communication

Equipment according to GMDSS regulations, Area A4
Three radars, three gyro compasses
Auto pilot, DGPS
Electronic chart system
3 x Anshutz
Calling, command, telephone system + CCTV

Safety Equipment

Fast Rescue Craft (FRC)
2 x 68 men lifeboats
According to SOLAS for the specified class and number of crew
Stability according to IMO Res. MSC.266 (84) code of safety for special purpose ships 2008

Tank Capacities

Fuel Oil	Approximately 2,000 m^3
Potable Water	Approximately 500 m^3
Technical / Cargo Water	Approximately 750 m^3
Technical / System Water	Approximately 200 m^3
Water Ballast	Approximately 3,800 m^3

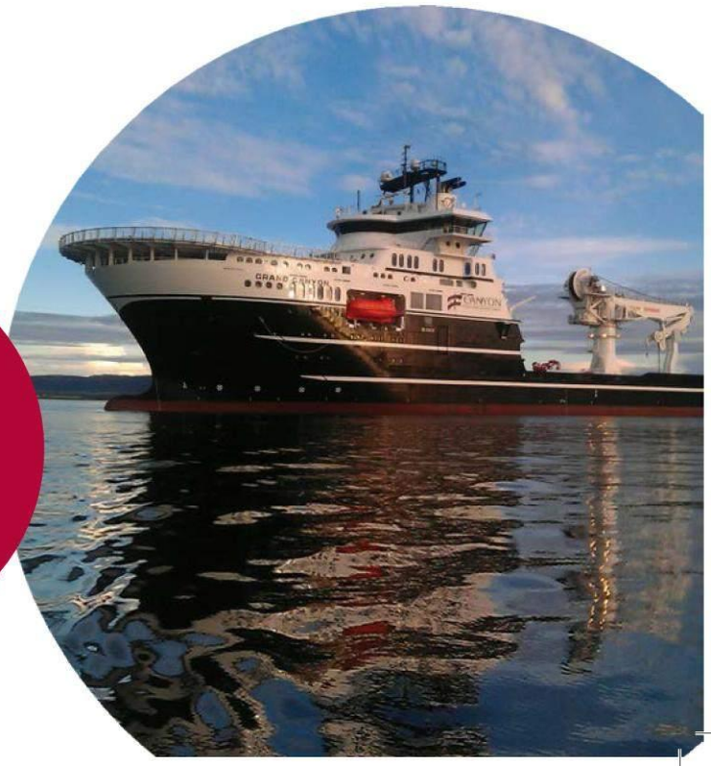
Power Generating Plant

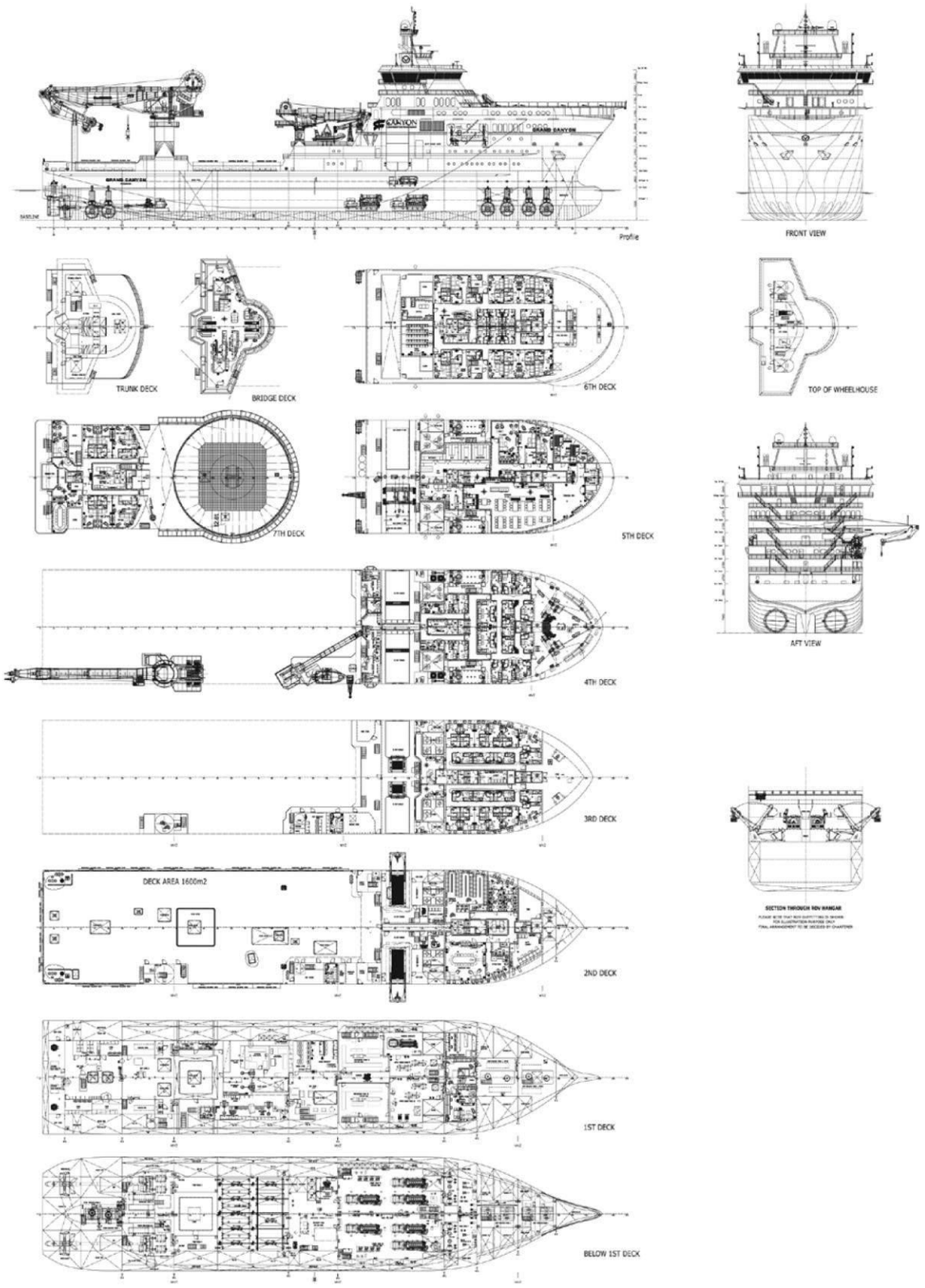
6 x 3,000 kW diesel generator sets, 720 rpm
1 x 550 kW emergency generator

Fuel Consumption

Dock	3.5 m^3 / day
Mob / Demob	5.5 m^3 / day
Normal Transit	35 m^3 / day
Fast Transit	50 m^3 / day
DP Low Loading Light Environmental Conditions	14 m^3 / day
DP Med Loading Increased Environmental Conditions	16 m^3 / day
DP High Loading High Environmental Conditions but within Operating Limits	22 m^3 / day

SPECIALLY DESIGNED FOR OPERATING UNDER SEVERE WEATHER CONDITIONS





HELIX
CANYON OFFSHORE

Helix Energy Solutions HQ
3505 W. Sam Houston
Parkway North,
Suite 400
Houston, Texas 77043
USA

www.HelixESG.com

Office 281.618.0400

Helix Canyon Offshore (USA)
3505 W. Sam Houston
Parkway North,
Suite 400
Houston, Texas 77043
USA

Office 281.618.0400

Helix Canyon Offshore (UK)
Helix House Aberdeen,
Kirkton Dr, Pitmedden Rd
Industrial Estate
Dyce Aberdeen AB21 0BG
United Kingdom

Office +44(0)1224.351800

Helix Canyon Offshore (Singapore)
Loyang Offshore Supply Base
25 Loyang Cresent
Block 603 TOPS Ave 6,
Unit 1 Box 5009,
Singapore 508988

Office 65.6.501.0130

SCHILLING ROBOTICS UHD-III ROV

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SCHILLING ROBOTICS UHD-III ROV

The UHD-III system delivers market-leading performance for the most difficult deepwater tasks. The 250-hp vehicle is capable of handling all ultra-heavy-duty requirements, capabilities with API 53 standards for secondary BOP intervention. This capability also enables users to perform other demanding tasks, including well intervention and hydrate remediation, using multiple fluids that can be carried onboard the ROV.

- Versatile 250-hp ROV and 150-hp auxiliary output
- Intelligent power management system providing highest thrust performance for ultra-heavy-duty tasks
- Industry's most accurate StationKeep with independent thruster control
- High-definition (HDTV) video suite
- 60-minute modular maintenance
- High-integrity hydraulic system - all stainless-steel tubing

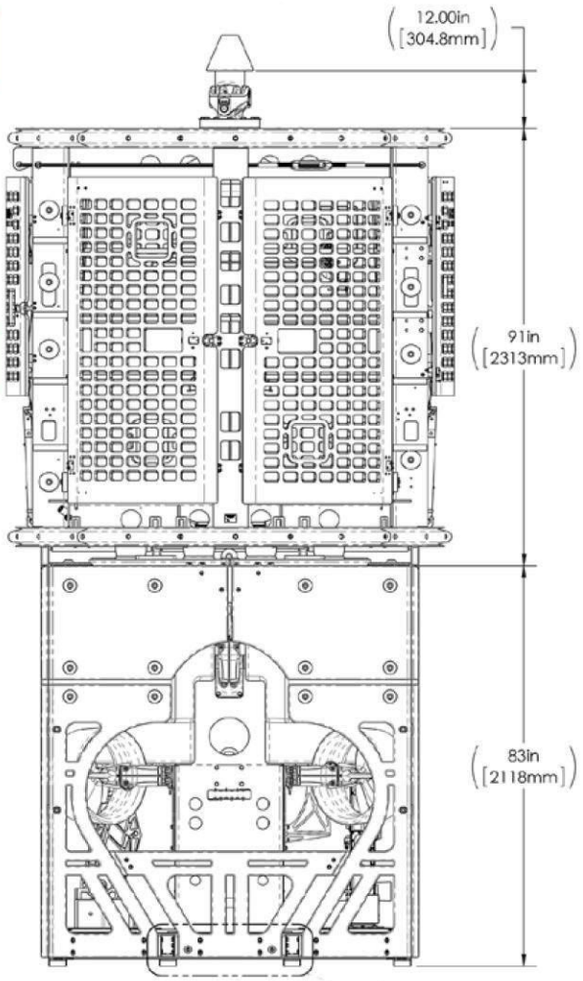
In addition to providing the most comprehensive intervention capability available, UHD-III incorporates features that further enhance the productivity of offshore operations. The system leverages the benefits of modular design for rapid maintenance, first introduced with Schilling Robotics' HD ROV. This modular approach improves maintenance times by a factor of 6-to-1 compared to traditional vehicles, and ensures that ROV operations are more reliable and productive than ever before. Performance of intervention tasks has also been enhanced through the integration of a high-definition video suite (HDTV). Enhanced automation dramatically reduces the time required to perform common intervention tasks by stabilizing the position of tooling relative to the intervention panel.

System-level design addresses all the major equipment elements (ROV, TMS, LARS, vans, and umbilical) to effectively optimize offshore operations. All aspects of the system have been aligned to provide exceptionally high reliability, combined with ease of operation and maintainability.

Specifications	
Docking Interface SWL	13,025 kg
Through-Frame Lift	3,500 kg
Weight in Air	5,600 kg
Dimensions	3.5m X 1.9m X 2.1m
Payload	450 kgf

Peak Thrust Performance	
Forward / Aft / Lateral	1,200 kgf
Vertical – Up / Down	1,000 kgf
Station Keep	10 cm

Equipment Fit	
Manipulators	(1) Titan 4 7 Function (1) Atlas 7 Function
Cameras	SD and HD Options
Depth Sensor	TOGS
DVL	RDI 1200kHz
Lights	(12) Variable 120 VAC / 250 W
Pan & Tilt	Schilling Electric
Valves	(14) 8 LPM (4) 32 LPM (2) 160 LPM



AFT BACK VIEW

SCHILLING ROBOTICS UHD-III ROV

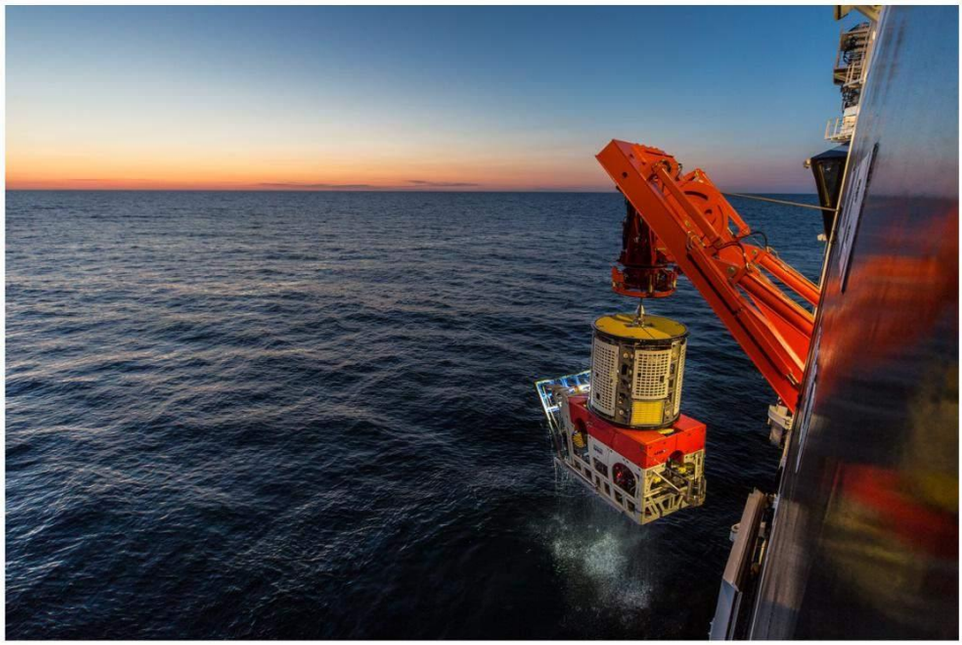
Digital Video Suite

The digital video-over-Ethernet system can transport both HD and SD video, through H.264 compression, that can be annotated and recorded via the video PC on surface.

- High-definition, low-latency streaming video at 1920 x 1080 resolution, 60 frames per second
- Video streaming using H.264 compression over RTSP
- SD low-latency streaming video at NTSC/PAL resolution
- Topside video output: HDMI, NTSC/PAL analog video
- Enables 1080P HD video transmission over standard Ethernet communications

Hydraulic System	
HPU	250 hp
Auxiliary	150 hp
Operating Pressure	207 Bar
Thrusters	(7) Sub Atlantic 420

Auxiliary Pump Capabilities	
Output	50 GPM at 5,000 psi 75 GPM at 2,500 psi
Pumps Independent Aux 1 and Aux 2 Fluids Simultaneously	
Fluids Supported	Hydraulic Oils Glycols Seawater MEG Methanol



HELIX CANYON OFFSHORE

Helix Energy Solutions HQ
3505 W. Sam Houston Parkway North,
Suite 400
Houston, Texas 77043
USA

Office 281.618.0400

Canyon Offshore (USA)
3505 W. Sam Houston Parkway North,
Suite 400
Houston, Texas 77043
USA

Office 281.618.0400

Canyon Offshore (UK)
Helix House Aberdeen,
Kirkton Dr, Pitmedden Rd
Industrial Estate
Dyce Aberdeen AB21 0BG
United Kingdom

Office +44(0)1224.351800

Canyon Offshore (Singapore)
Loyang Offshore Supply Base
25 Loyang Cresent
Block 603 TOPS Ave 6,
Unit 1 Box 5009,
Singapore 508988

Office 65.6.501.0130

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Appendix F: Coastal Zone Management Certifications (LA & AL)

Coastal Zone Management Consistency Certification
State of Alabama

Development Operations and Coordination Document
Type of OCS Plan

Mississippi Canyon Block 562
Area and Block

OCS-G 19966 Lease Number

August 2018

CSA-BP-FL-18-80833-3316-03-REP-01-FIN

The proposed activities described in detail in this OCS Plan comply with Alabama's approved Coastal Management Program and will be conducted in a manner consistent with such Program.

BP

Lessee or Operator

Certifying Official

8/16/2018

Date

Evaluation of Consistency with Alabama Enforceable Policies

1 Background

BP Exploration & Production Inc. (BP) is submitting a Development Operations and Coordination Document (DOCD) to the Bureau of Ocean Energy Management (BOEM). The DOCD covers the installation of single well subsea tie-back in BP's Isabela prospect to existing subsea facilities at the Galapagos Oil Loop. The Isabela 2 tree will be tied back to the existing IS PLEM 2 via a new rigid jumper. Power, hydraulics, and chemicals will be delivered from the existing Isabela infield umbilical to the Isabela 2 tree. Services will be taken from the existing far end UTA of the Isabela infield umbilical and re-routed appropriately via flying leads. A new subsea metering skid (SMS) will tie into the existing Isabela UTA via flying leads to route chemicals (AI, SI, CI) to the Isabela 2 tree. A dynamically positioned construction vessel is anticipated to be on site for up to 37 days and is estimated that drilling activities will occur in late 2018.

This regulatory analysis and consistency determination evaluates BP's DOCD for any reasonably foreseeable coastal effects on the land, water uses, or natural resources of the coastal zone of Alabama, pursuant to the enforceable policies of the Alabama Coastal Area Management Program (ACAMP). The analysis is submitted pursuant to 15 Code of Federal Regulations (CFR) 930.76 and is supported by documentation provided in the accompanying Environmental Impact Analysis (EIA) prepared in accordance with applicable regulations, including 30 CFR 550.212(o) and 550.227 as well as Notice to Lessees and Operators (NTL) 2008-G04, extended by NTL 2015-N02.

MC 562 is located within the Central Gulf of Mexico Outer Continental Shelf (OCS) Planning Area, approximately 120 statute miles (193 km) from the nearest Alabama shoreline. BP may use port facilities in Alabama to transport equipment for the project, but BP does not expect the proposed activities to otherwise affect the State of Alabama. The proposed activities will be conducted in accordance with the regulations of BOEM, the Bureau of Safety and Environmental Enforcement, and the U.S. Environmental Protection Agency as well as applicable NTLs, conditions in the approved permits, and lease stipulations.

2 Evaluation

Table 1 evaluates the proposed activities with respect to the enforceable policies of the ACAMP according to 15 CFR 930.76 (b), (c), and (d). The ACAMP was approved and has been in effect since 1979 (National Oceanic and Atmospheric Administration and Alabama Coastal Area Board, 1979), and was most recently updated in 2017 (Alabama Department of Conservation & Natural Resources, 2017). Its purpose is to promote, improve, and safeguard the lands and waters located in Alabama's coastal area through a comprehensive and cooperative program designed to preserve, enhance, and develop these valuable resources for present and future generations. The enforceable policies of the program regulate various activities on coastal lands and waters in Baldwin and Mobile Counties of Alabama.

3 Consistency Certification

The analysis indicates that BP's DOCD for MC 562 is consistent with the guidelines and policies provided by the ACAMP. Routine operations will have limited environmental impacts in the project area. All land-based support activities, including transport to and from the site, will be from Alabama or Louisiana.

Table 1. Evaluation of the Revised Exploration Plan (EP) relative to the enforceable policies of the Alabama Coastal Area Management Program (ACAMP).

Policy	Cross Reference to the EP	Comments	Consistent with ACAMP Policies? (Yes/No)
Coastal Resource Use Policies			
Coastal Development	DOCD Section 1 – Plan Contents	Routine activities are not anticipated to affect Alabama's coastal development. The proposed activities will occur in Federal Outer Continental Shelf (OCS) waters approximately 120 statute miles (193 km) from the nearest Alabama shoreline, and BP will use existing onshore support facilities in Louisiana. Equipment may be shipped to the lease area from Alabama, but no impacts on coastal development are expected.	Yes
Mineral Resource Exploration and Extraction	DOCD Section 1 – Plan Contents	Routine activities are not anticipated to affect mineral resource exploration and extraction in Alabama's coastal zone. The proposed activities will occur in Federal OCS waters approximately 120 statute miles (193 km) from the nearest Alabama shoreline and do not include any extraction of minerals from the Alabama coastal zone.	Yes
Commercial Fishing	DOCD Appendix D – EIA (C.8.1 Recreational and Commercial Fishing)	Routine activities are not anticipated to affect commercial fishing in Alabama's coastal zone. Routine activities may have limited environmental impacts in Federal OCS waters, approximately 120 statute miles (193 km) from the nearest Alabama shoreline. Pelagic longlining activities in the lease area and other commercial fishing activities in the northern Gulf of Mexico, including Alabama's coastal zone, could be interrupted in the event of a large oil spill. A spill may or may not result in fishery closures depending on the duration of the spill, the oceanographic and meteorological conditions at the time, and the effectiveness of spill response measures. The potential impacts of an oil spill on Alabama's coastal zone are analyzed in the EIA. In the event of a spill, BP will implement the plans and procedures of its Regional Oil Spill Response Plan (OSRP). The precautions addressed in BP's standard safety and environmental operating procedures and Regional OSRP are consistent with the protection of Alabama's fishery resources and commercial fishing industry.	Yes
Coastal Hazard Management	DOCD Section 3 – Geological and Geophysical Information DOCD Section 9 – Oil Spill Information DOCD Appendix D – EIA (D. Environmental Hazards)	Site clearance surveys indicated seafloor conditions are suitable for proposed activities in the lease block. Routine activities are not anticipated to increase the susceptibility of the Alabama's coastal zone to natural hazards due to the location of the proposed activities in Federal OCS waters, approximately 120 statute miles (193 km) from the nearest Alabama shoreline. Onshore support facilities may be located in Alabama; however,-no new development in coastal areas, construction, dredging, or filling on Alabama's lands or waters are anticipated. In the event of a spill, BP will implement the plans and procedures of its Regional OSRP. Any cleanup or recovery activities in Alabama would be conducted using applicable best management practices to minimize shoreline erosion.	Yes

Table 1. (Continued).

Policy	Cross Reference to the EP	Comments	Consistent with ACAMP Policies? (Yes/No)
Shoreline Erosion	DOCD Appendix D – EIA (C.7 Coastal Habitats and Protected Areas)	Routine activities are not anticipated to affect Alabama's shoreline due to the location of the proposed activities in Federal OCS waters, approximately 120 statute miles (193 km) from the nearest Alabama shoreline. Onshore support facilities may be located in Alabama; however, no new development in coastal areas, construction, dredging, or filling on Alabama's lands or waters are anticipated that could cause shoreline erosion. In the event of a spill, any cleanup or recovery activities in Alabama would be conducted using applicable best management practices to minimize shoreline erosion.	Yes
Recreation	DOCD Section 9 – Oil Spill Information DOCD Appendix D – EIA (C.8.4 Recreation and Tourism)	There will be no routine activities in the Alabama coastal zone that could interfere with or diminish public access to coastal lands and waters for recreation. Recreational resources and tourism in coastal areas would not be affected by any routine activities due to the distance from shore. There are no known recreational uses of the lease area. BP operations has a marine trash and debris program, in addition, compliance with NTL BSEE-2015-G03 will minimize the chance of trash or debris being lost overboard and subsequently washing up on beaches. In the event of a spill, BP will implement the plans and procedures of its Regional OSRP. The precautions addressed in BP's standard safety and environmental operating procedures and its Regional OSRP are consistent with the ACAMP policy of safeguarding public access to coastal lands and waters for recreation.	Yes
Transportation	DOCD Section 111 – Lease Stipulations DOCD Appendix D – EIA (C.8.6 Other Marine Uses)	Routine activities are not anticipated to affect transportation. The lease area is not located within any United States Coast Guard-designated fairway or shipping lane, or within any Military Warning Area. BP will comply with the Bureau of Ocean Energy Management requirements and lease stipulations to avoid impacts on uses of the area by military vessels and aircrafts. Onshore support facilities may be located in Alabama; however,-no impacts on Alabama transportation routes or infrastructure are expected to occur.	Yes
Natural Resource Protection Policies			
Biological Productivity	DOCD Section 7 – Wastes and Discharges Information DOCD Section 9 – Oil Spill Information DOCD Appendix D – (C.7 Coastal Habitats and Protected Areas)	Routine activities are not anticipated to affect biologically productive coastal habitats, including estuaries. The proposed activities will be conducted in Federal OCS waters approximately 120 statute miles (193 km) from the nearest Alabama shoreline. BP will potentially use onshore support facilities in Alabama. In the event of a spill, BP will implement the plans and procedures of its Regional OSRP. The precautions addressed in BP's standard safety and environmental operating procedures and its Regional OSRP are consistent with the ACAMP policy of protecting and preserving biologically productive coastal habitats.	Yes

Table 1. (Continued).

Policy	Cross Reference to the EP	Comments	Consistent with ACAMP Policies? (Yes/No)
Water Quality and Water Resources	DOCD Section 9 – Oil Spill Information DOCD Appendix D – EIA (C.1.2 Water Quality)	Routine activities are not anticipated to affect Alabama's coastal water quality or water resources. The proposed activities will be conducted in Federal OCS waters, approximately 120 statute miles (193 km) from the nearest Alabama shoreline. All discharges for the proposed activity will be governed by a National Pollutant Discharge Elimination System General Permit. The authorized overboard discharges during the proposed activities will be localized in offshore waters and are not expected to affect Alabama's water quality or water resources. BP will be using onshore support facilities in Louisiana. In the event of a spill, BP will implement the plans and procedures of its Regional OSRP. The precautions addressed in BP's standard safety and environmental operating procedures and its Regional OSRP are consistent with the core policies of conserving surface and ground waters for full beneficial use.	Yes
Air Quality	DOCD Section 8 – Air Emissions Information DOCD Appendix D – EIA (C.1.1 Air Quality)	Routine activities are not anticipated to affect Alabama's coastal air quality. The proposed activities will be conducted in Federal OCS waters, approximately 120 statute miles (193 km) from the nearest Alabama shoreline. In the event of a spill, BP will implement the plans and procedures of its Regional OSRP. The precautions addressed in BP's standard safety and environmental operating procedures and its Regional OSRP are consistent with the protection of coastal air quality.	Yes
Wetlands and Endemic Submerged Aquatic Vegetation	DOCD Section 6 – Biological, Physical, and Socioeconomic Information DOCD Section 9 – Oil Spill Information DOCD Appendix D – EIA (C.7 Coastal Habitats and Protected Areas)	Routine activities are not anticipated to affect Alabama's wetlands and endemic submerged aquatic vegetation. The proposed activities will be conducted in Federal OCS waters approximately 120 statute miles (193 km) from the nearest Alabama shoreline. BP may potentially use onshore support facilities in Alabama. However, there will be no new construction, dredging, or filling on Alabama's lands or waters that could affect wetlands or submerged seagrass beds. In the event of a spill, BP will implement the plans and procedures of its Regional OSRP. Any cleanup or recovery activities in Alabama would be conducted using applicable best management practices to minimize impacts on wetlands, seagrass beds, and other coastal habitats.	Yes

Table 1. (Continued).

Policy	Cross Reference to the EP	Comments	Consistent with ACAMP Policies? (Yes/No)
Beach and Dune Protection	DOCD Section 6 – Biological, Physical, and Socioeconomic Information DOCD Section 9 – Oil Spill Information DOCD Appendix D – EIA (C.7 Coastal Habitats and Protected Areas)	Routine activities are not anticipated to affect Alabama's beaches and dunes. The proposed activities will be conducted in Federal OCS waters approximately 120 statute miles (193 km) from the nearest Alabama shoreline. BP may potentially use onshore support facilities in Alabama.-However, there will be no new construction, dredging, or filling on Alabama's lands or waters that could weaken, damage, or destroy the integrity of the coastal areas or cause erosion of beaches or dunes. In the event of a spill, BP will implement the plans and procedures of its Regional OSRP. Any cleanup or recovery activities in Alabama would be conducted using applicable best management practices to minimize shoreline erosion and impacts on beach and dune systems.	Yes
Wildlife Habitat Protection	DOCD Section 6 – Biological, Physical, and Socioeconomic Information DOCD Section 9 – Oil Spill Information DOCD Appendix D – EIA (C.3 Threatened, Endangered, and Protected Species and Critical Habitat; and C.7 Coastal Habitats and Protected Areas)	Routine activities are not anticipated to affect Alabama's wildlife habitat. The proposed activities will be conducted in Federal OCS waters approximately 120 statute miles (193 km) from the nearest Alabama shoreline. BP may potentially use onshore support facilities in Alabama. However, there will be no new construction, dredging, or filling on Alabama's lands or waters that could affect coastal wildlife habitats, including critical habitats for endangered or threatened species. In the event of a spill, BP will implement the plans and procedures of its Regional OSRP. Any cleanup or recovery activities in Alabama would be conducted using applicable best management practices to minimize impacts on wildlife habitats.	Yes
Threatened and Endangered Species	DOCD Section 6 – Biological, Physical, and Socioeconomic Information DOCD Section 9 – Oil Spill Information DOCD Section 10 – Environmental Monitoring and Mitigation Measures DOCD Appendix D – EIA (C.3 Threatened, Endangered, and Protected Species and Critical Habitat)	Routine activities are not anticipated to affect Alabama's endangered species. The proposed activities will be conducted in Federal OCS waters approximately 120 statute miles (193 km) from the nearest Alabama shoreline. BP may potentially use onshore support facilities in Alabama. However, there will be no new construction, dredging, or filling on Alabama's lands or waters that could affect endangered or threatened species or their coastal wildlife habitats. In the event of a spill, BP will implement the plans and procedures of its Regional OSRP. Any cleanup or recovery activities in Alabama would be conducted using applicable best management practices to minimize impacts on endangered and threatened species and their habitats.	Yes

Table 1. (Continued).

Policy	Cross Reference to the EP	Comments	Consistent with ACAMP Policies? (Yes/No)
Cultural Resources Protection	DOCD Section 6 – Biological, Physical, and Socioeconomic Information DOCD Section 9 – Oil Spill Information DOCD Appendix D – EIA (C.6 Archaeological Resources)	Routine activities are not anticipated to affect Alabama's cultural resources located within the coastal zone. The proposed activities will be conducted in Federal OCS waters approximately 120 statute miles (193 km) from the nearest Alabama shoreline. BP may potentially use onshore support facilities in Louisiana. However, BP does not anticipate the proposed activities will affect any sunken or abandoned ships or objects of historical or archaeological value located on Alabama lands or waters. In the event of a spill, BP will implement the plans and procedures of its Regional OSRP. Any cleanup or recovery activities in Alabama would be conducted using applicable best management practices to minimize impacts to sensitive cultural resources.	Yes

DOCD = Development Operations and Coordination Document; EIA = Environmental Impact Analysis.

4 References Cited

Alabama Department of Conservation & Natural Resources, 2017. Alabama Coastal Area Management Program IV.

National Oceanic and Atmospheric Administration and Alabama Coastal Area Board. 1979. The Alabama Coastal Area Management Program and Final Environmental Impact Statement.

Coastal Zone Management Consistency Certification
State of Louisiana

Development Operations and Coordination Document
Type of OCS Plan

Mississippi Canyon Block 562
Area and Block

OCS-G 19966
Lease Number

August 2018

CSA-BP-FL-18-80833-3316-02-REP-01-FIN

The proposed activities described in detail in this OCS Plan comply with Louisiana's approved Coastal Management Program and will be conducted in a manner consistent with such Program.

BP

Lessee or Operator

Certifying Official

8/16/2018

Date

Evaluation of Consistency with the Enforceable Policies of the Louisiana Coastal Resource Program

1 Background

BP Exploration & Production Inc. (BP) is submitting a Development Operations and Coordination Document (DOCD) to the Bureau of Ocean Energy Management (BOEM). Under this DOCD, BP proposes to install a single well subsea tie-back in BP's Isabela prospect to existing subsea facilities at the Galapagos Oil Loop in MC 562. This document evaluates BP's DOCD for any reasonably foreseeable coastal effects on the land, water uses, or natural resources of the coastal zone of Louisiana, and evaluates the consistency of BP's DOCD with the enforceable policies of the Louisiana Coastal Resource Program (LCRP). The analysis, compliant with the Coastal Zone Management Act (CZMA), is submitted pursuant to 15 Code of Federal Regulations (CFR) 930.76 and is supported by documentation provided in the Environmental Impact Analysis (EIA). The EIA provides an environmental impacts analysis for the proposed activities based on the location in MC 562 and is included in DOCD Appendix D. The EIA was prepared in accordance with applicable regulations, including 30 CFR 550.242(s) and 550.261 as well as Notice to Lessees and Operators (NTL) 2008-G04, extended by NTL 2015-N02, and 2015-N01.

The proposed activities will be conducted in accordance with Bureau of Ocean Energy Management (BOEM), Bureau of Safety and Environmental Enforcement (BSEE), and U.S. Environmental Protection Agency (USEPA) regulations, applicable NTLs, conditions in the approved permits, and lease stipulations. Required federal permits will be obtained, and activities will be conducted in compliance with such regulations, NTLs, conditions, and stipulations.

The proposed activities will occur in Federal Outer Continental Shelf (OCS) waters, approximately 64 statute miles (103 km) from the nearest Louisiana shoreline (**Figure 1**). A dynamically positioned construction vessel is anticipated to be on site for up to 37 days. All land-based support activities, including transport to and from the site, may be from Louisiana. No new expansion of facilities or personnel for shorebases is anticipated to result from this exploration project. No significant impacts on the State of Louisiana are expected from routine activities as described in BP's DOCD.

There is no drilling associated with BP's DOCD and there is no possibility of a well blowout. The worst case discharge (WCD) for BP's DOCD entails a complete loss of the contents of the largest fuel tank of the DP construction vessel (16,800 bbl of fuel oil with API gravity of 35°). Oil Spill Information is provided in Section 9 of the DOCD. In addition, some mitigation measures have been identified in the EIA that may reduce the likelihood of spills from a vessel conducting activities that fall under this DOCD. If a spill were to occur, BP will implement the plans and procedures of its Regional Oil Spill Response Plan (OSRP), which describes specific response actions for potential spill events and addresses plans and procedures for containment, recovery, and removal of an oil spill. As discussed in Section A.9.2 of the EIA (Large Oil Spill [Worst Case Discharge]), the trajectory of a hypothetical spill in MC 562, projected using information in the 60-day Oil Spill Risk Analysis model for the Gulf of Mexico (see BOEM, 2017), indicates there is up to a 36% conditional probability of a spill contacting any Louisiana shoreline within 60 days of a spill.

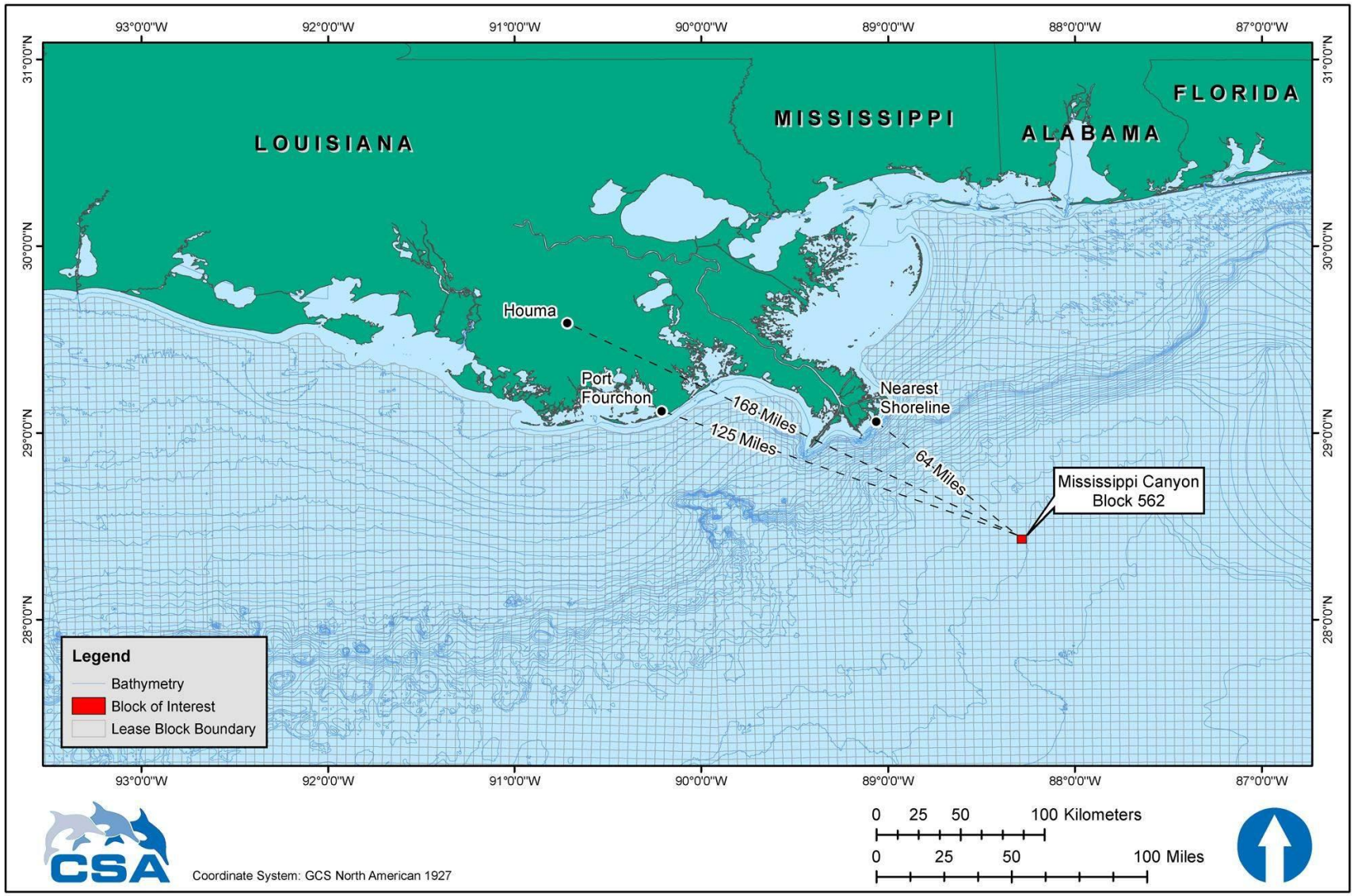

Figure 1. Location of Mississippi Canyon Block 562.

2 Louisiana Coastal Resource Program Guidelines

Pursuant to the Louisiana State and Local Resources Management Act of 1978, as amended (Act 361, La. R.S. 49:214.21 et seq.), the Office of Coastal Management of the Louisiana Department of Natural Resources has created guidelines to implement the LCRP (LAC 43:I.Chapter 7). The guidelines are organized as a set of performance standards that are used to evaluate the impacts of a proposed action on coastal resources. All guidelines applicable to BP's proposed project in MC 562 are summarized below.

§701. Guidelines Applicable to All Uses

A. The guidelines must be read in their entirety. Any proposed use may be subject to the requirements of more than one guideline or section of guidelines and all applicable guidelines must be complied with.

The guidelines have been read in their entirety in preparation of this consistency analysis for the MC 562 project, and BP expects to comply with all applicable guidelines.

B. Conformance with applicable water and air quality laws, standards and regulations, and with those other laws, standards and regulations which have been incorporated into the coastal resources program shall be deemed in conformance with the program except to the extent that these guidelines would impose additional requirements.

Addressed in DOCD Sections 7 and 8 and Appendix D.

C. The guidelines include both general provisions applicable to all uses and specific provisions applicable only to certain types of uses. The general guidelines apply in all situations. The specific guidelines apply only to the situations they address. Specific and general guidelines should be interpreted to be consistent with each other. In the event there is an inconsistency, the specific should prevail.

The guidelines have been read in their entirety, and all applicable guidelines are summarized and addressed herein.

F. Information regarding the following general factors shall be utilized by the permitting authority in evaluating whether the proposed use is in compliance with the guidelines:

1. *type, nature, and location of use;*
2. *elevation, soil, and water conditions and flood and storm hazard characteristics of site;*
3. *techniques and materials used in construction, operation, and maintenance of use;*
4. *existing drainage patterns and water regimes of surrounding area including flow, circulation, quality, quantity, and salinity; and impacts on them;*
5. *availability of feasible alternative sites or methods of implementing the use;*
6. *designation of the area for certain uses as part of a local program;*
7. *economic need for use and extent of impacts of use on economy of locality;*
8. *extent of resulting public and private benefits;*
9. *extent of coastal water dependency of the use;`*

10. *existence of necessary infrastructure to support the use and public costs resulting from use;*
11. *extent of impacts on existing and traditional uses of the area and on future uses for which the area is suited;*
12. *proximity to and extent of impacts on important natural features such as beaches, barrier islands, tidal passes, wildlife and aquatic habitats, and forest lands;*
13. *the extent to which regional, state, and national interests are served including the national interest in resources and the siting of facilities in the coastal zone as identified in the coastal resources program;*
14. *proximity to, and extent of impacts on, special areas, particular areas, or other areas of particular concern of the state program or local programs;*
15. *likelihood of; and extent of impacts of; resulting secondary impacts and cumulative impacts;*
16. *proximity to and extent of impacts on public lands or works, or historic, recreational, or cultural resources;*
17. *extent of impacts on navigation, fishing, public access, and recreational opportunities;*
18. *extent of compatibility with natural and cultural setting; and*
19. *extent of long term benefits or adverse impacts.*

Addressed in DOCD Sections 1, 6, and 10, and Appendix D.

G. *It is the policy of the coastal resources program to avoid the following adverse impacts. To this end, all uses and activities shall be planned, sited, designed, constructed, operated, and maintained to avoid to the maximum extent practicable significant:*

1. *reductions in the natural supply of sediment and nutrients to the coastal system by alterations of freshwater flow;*
2. *adverse economic impacts on the locality of the use and affected governmental bodies;*
3. *detrimental discharges of inorganic nutrient compounds into coastal waters;*
4. *alterations in the natural concentration of oxygen in coastal waters;*
5. *destruction or adverse alterations of streams, wetland, tidal passes, inshore waters and water bottoms, beaches, dunes, barrier islands, and other natural biologically valuable areas or protective coastal features;*
6. *adverse disruption of existing social patterns;*
7. *alterations of the natural temperature regime of coastal waters;*
8. *detrimental changes in existing salinity regimes;*
9. *detrimental changes in littoral and sediment transport processes;*
10. *adverse effects of cumulative impacts;*
11. *detrimental discharges of suspended solids into coastal waters, including turbidity resulting from dredging;*

12. *reductions or blockage of water flow or natural circulation patterns within or into an estuarine system or a wetland forest;*

13. *discharges of pathogens or toxic substances into coastal waters;*

14. *adverse alteration or destruction of archaeological, historical, or other cultural resources;*

15. *fostering of detrimental secondary impacts in undisturbed or biologically highly productive wetland areas;*

16. *adverse alteration or destruction of unique or valuable habitats, critical habitat for endangered species, important wildlife or fishery breeding or nursery areas, designated wildlife management or sanctuary areas, or forestlands;*

17. *adverse alteration or destruction of public parks, shoreline access points, public works, designated recreation areas, scenic rivers, or other areas of public use and concern;*

18. *adverse disruptions of coastal wildlife and fishery migratory patterns;*

19. *land loss, erosion, and subsidence;*

20. *increases in the potential for flood, hurricane and other storm damage, or increases in the likelihood that damage will occur from such hazards; and*

21. *reduction in the long term biological productivity of the coastal ecosystem.*

Addressed in DOCD Sections 6 and 7, and Appendix D.

I. *Uses shall to the maximum extent practicable be designed and carried out to permit multiple concurrent uses which are appropriate for the location and to avoid unnecessary conflicts with other uses of the vicinity.*

Addressed in DOCD Sections 1 and 2.

§703. Guidelines for Levees

Not applicable.

§705. Guidelines for Linear Facilities

Not applicable.

§707. Guidelines for Dredged Spoil Deposition

Not applicable.

§709. Guidelines for Shoreline Modification

Not applicable.

§711. Guidelines for Surface Alterations

Not applicable. Surface alterations to shorebases are not required for this project.

§713. Guidelines for Hydrologic and Sediment Transport Modifications

Not applicable.

7§715. Guidelines for Disposal of Wastes

A. *The location and operation of waste storage, treatment, and disposal facilities shall be avoided in wetlands to the maximum extent practicable, and best practical techniques shall be used to minimize adverse impacts which may result from such use.*

Addressed in DOCD Sections 7 and 14, and Appendices C and D.

B. *The generation, transportation, treatment, storage, and disposal of hazardous wastes shall be pursuant to the substantive requirements of the Department of Environmental Quality adopted pursuant to the provisions of R.S. 30:217, et seq.; as amended and approved pursuant to the Resource Conservation and Recovery Act of 1976 P.L. 94-580, as amended, and of the Office of Conservation for injection below surface.*

Addressed in DOCD Sections 7 and 14, and Appendices C and D.

C. *Waste facilities located in wetlands shall be designed and built to withstand all expectable adverse conditions without releasing pollutants.*

Not applicable.

D. *Waste facilities shall be designed and constructed using best practical techniques to prevent leaching, control leachate production, and prevent the movement of leachate away from the facility.*

Not applicable.

E. *The use of overland flow systems for nontoxic, biodegradable wastes, and the use of sump lagoons and reservoirs utilizing aquatic vegetation to remove pollutants and nutrients shall be encouraged.*

Not applicable.

F. *All waste disposal sites shall be marked and, to the maximum extent practicable, all components of waste shall be identified.*

Not applicable.

G. *Waste facilities in wetlands with identifiable pollution problems that are not feasible and practical to correct shall be closed and either removed or sealed, and shall be properly revegetated using the best practical techniques.*

Not applicable.

H. *Waste shall be disposed of only at approved disposal sites.*

Addressed in DOCD Sections 7 and 14, and Appendices C and D.

I. *Radioactive wastes shall not be temporarily or permanently disposed of in the coastal zone.*

Radioactive wastes are expected during the completion phase of the project and will be addressed in DOCD Sections 7 and 14, and Appendices C and D.

§717. Guidelines for Uses that Result in the Alteration of Waters Draining into Coastal Waters

Not applicable.

§719. Guidelines for Oil, Gas, and Other Mineral Activities

A. *Geophysical surveying shall utilize the best practical techniques to minimize disturbance or damage to wetlands, fish and wildlife, and other coastal resources.*

Not applicable; all geophysical survey work related to this project was conducted on the OCS in MC 562, approximately 64 statute miles (103 km) from the nearest Louisiana shoreline. Geological and geophysical information is provided in DOCD Section 3.

B. *To the maximum extent practicable, the number of mineral exploration and production sites in wetland areas requiring floatation access shall be held to the minimum number, consistent with good recovery and conservation practices and the need for energy development, by directional drilling, multiple use of existing access canals, and other practical techniques.*

Not applicable; all activities related to this project will be conducted on the OCS in MC 562, approximately 64 statute miles (103 km) from the nearest Louisiana shoreline.

C. *Exploration, production, and refining activities shall, to the maximum extent practicable, be located away from critical wildlife areas and vegetation areas. Mineral operations in wildlife preserves and management areas shall be conducted in strict accordance with the requirements of the wildlife management body.*

Addressed in DOCD Sections 1, 6, and 10, and Appendix D. No activities will be conducted in wildlife preserves or management areas. All activities related to this project will be conducted on the OCS in MC 562. Shore-based support may originate from Louisiana. The nearest Louisiana shoreline is approximately 64 statute miles (103 km) from the project area.

During a large scale incident, a few of Louisiana Wildlife Refuges, Wilderness Areas, and State and National Parks that could potentially be affected by oiling within 30 days of a large spill, along with the natural resources found in each area, is provided in **Table 1**.

D. *Mineral exploration and production facilities shall be to the maximum extent practicable designed, constructed, and maintained in such a manner to maintain natural water flow regimes, avoid blocking surface drainage, and avoid erosion.*

Not applicable; all activities related to this project will be conducted on the OCS in MC 562, approximately 64 statute miles (103 km) from the nearest Louisiana shoreline.

E. *Access routes to mineral exploration, production, and refining sites shall be designed and aligned so as to avoid adverse impacts on critical wildlife and vegetation areas to the maximum extent practicable.*

Addressed in DOCD Sections 13 and 14, and Appendix D.

F. Drilling and production sites shall be prepared, constructed, and operated using the best practical techniques to prevent the release of pollutants or toxic substances into the environment.

Addressed in DOCD Sections 1, 2, 9, 10 and Appendix D.

Table 1. Louisiana Wildlife Refuges, Wilderness Areas, State and National Parks, and natural resources within the geographic range of potential shoreline oil contact within 30 days of a large discharge event based on Oil Spill Risk Analysis Launch Point 59 (From: BOEM, 2017).

Wildlife Refuge, Wilderness Area, State or National Park	Resource Description
Cameron Parish	
Lacassine NWR	Established in 1937, Lacassine NWR is approximately 35,000 acres of freshwater marsh. Approximately half of the acreage of the NWR is natural freshwater marsh and open water. Notable wildlife includes nesting colonies of wading and water birds, alligators, eagles, falcons, and Louisiana black bears as well as wintering populations of several species of ducks. The NWR is known for vast numbers of pintails congregating each winter. The NWR is available for a multitude of recreational opportunities, including fishing, hunting, boating, and hiking (U.S. Fish and Wildlife Service [USFWS], 2016a).
Peveto Woods Bird and Wildlife Sanctuary	A bird sanctuary owned by the Baton Rouge Audubon Society, this sanctuary is a 40-acre tract of coastal land in Cameron Parish. During the spring and fall migrations, the sanctuary is home to numerous species of songbirds. It is estimated that nearly 2 million birds seek refuge in the sanctuary each year before and after their trans-Gulf migrations. The sanctuary is also used by numerous species of butterflies, including the migratory Monarch butterfly (Baton Rouge Audubon Society, 2010).
Rockefeller Wildlife Refuge and Game Preserve	Rockefeller Wildlife Refuge, located in eastern Cameron and western Vermilion Parishes, is owned and maintained by the State of Louisiana. The refuge is a flat, treeless area with highly organic soils that are capable of producing immense quantities of waterfowl foods in the form of annual emergents and submerged aquatics. When deeded to the state, the refuge encompassed approximately 86,000 acres, but beach erosion has taken a heavy toll, and the most recent surveys indicate only 76,042 acres remain. This area borders the Gulf of Mexico for 26.5 miles and extends inland toward the Grand Chenier ridge, a stranded beach ridge 6 miles from the Gulf of Mexico. Common resident animals include Mottled Ducks, nutria, muskrat, rails, raccoon, mink, otter, opossum, white-tailed deer, and alligators. An abundant fisheries population provides recreational opportunities to fishermen seeking shrimp, redfish, speckled trout, black drum, and largemouth bass, among others (Louisiana Department of Wildlife and Fisheries, n.d. - a).
Sabine NWR	Sabine NWR includes 124,511 acres of fresh, intermediate, and brackish marshes that provide habitat for waterfowl and other birds. Designated as an Internationally Important Bird Area, the refuge is known to provide habitat for more than 300 species of birds, 26 species of mammals, 41 species of reptiles and amphibians, 132 species of fish, and 68 species of marine invertebrates. Common bird species include Mottled Ducks, Great Egrets, Neotropic Cormorants, Snowy Egrets, and various species of wading birds and shorebirds. American alligators are known to be very common in the refuge as well (USFWS, 2016b).

Table 1. (Continued).

Wildlife Refuge, Wilderness Area, State or National Park	Resource Description
Vermilion Parish	
Paul J. Rainey Wildlife Refuge and Game Preserve	Paul J. Rainey Wildlife Refuge and Game Preserve is a privately owned 26,000-acre coastal wetland in Vermilion Parish owned by the National Audubon Society. Formerly open to gas drilling, hydrocarbon exploration ended in 1999. Notable fauna include deer, muskrats, otters, geese, and numerous other species of birds. No hunting or fishing is currently allowed in the Preserve (National Audubon Society, 2017).
Rockefeller Wildlife Refuge and Game Preserve	See description under Cameron Parish.
State Wildlife Refuge	State Wildlife Refuge is a 13,000-acre tract owned by the State of Louisiana. Located on the southwest shore of Vermilion Bay, the focus of the refuge is on natural resource conservation. The refuge is an important waterfowl wintering area and serves as habitat for numerous species of shorebirds, wading birds, alligators, shrimp, fish, and crabs. Mammals such as raccoons, muskrats, nutria, mink, and deer are common as well (Louisiana Department of Wildlife and Fisheries, n.d. - b).
White Lake Wetlands Conservation Area	Located in southwest Vermilion Parish, the area is approximately 72,000 acres of freshwater marsh, cropland, wetlands, wooded areas, and campsites. The marsh areas are managed to provide habitat for wintering waterfowl and other native species (Louisiana Department of Wildlife and Fisheries, n.d. - c).
Terrebonne Parish	
Isles Dernieres Barrier Islands Refuge	This refuge is made up of three barrier islands offshore of Terrebonne Parish: Wine Island, Whiskey Island, and Raccoon Island, for a total of approximately 630 acres. The primary management goal of the refuge is to provide and protect habitat for nesting waterbirds. Raccoon Island is one of the most important waterbird nesting sites on the Gulf coast (Louisiana Department of Wildlife and Fisheries, n.d. - d).
Mandalay NWR	Mandalay NWR was established in 1996 as 4,419 acres of freshwater marsh and cypress-tupelo swamp. Access to the refuge is by boat only. Popular activities in the refuge include wildlife observation, boating, fishing, and hunting. The refuge proves important habitat for wintering waterfowl of the Mississippi flyway. Other notable wildlife include ducks, white tailed deer, alligators, and numerous bird species, including herons, egrets, and eagles (USFWS, 2016c).
Point-aux-Chenes WMA	Point-aux-Chenes WMA is a 35,000-acre marshland owned and operated by the Louisiana Department of Wildlife and Fisheries. Access to the WMA typically is limited to boats as there are no roads through the marshland. Notable game species present in the WMA include waterfowl, deer, rabbit, squirrels, rails, gallinules, and snipe. Both saltwater and freshwater fishing in the WMA is considered excellent due to the nearby Timbalier and Terrebonne Bay watersheds. Annual lotteries are held by the Louisiana Department of Wildlife and Fisheries for a waterfowl hunt exclusively for physically challenged hunters and a deer hunt for youth (Louisiana Department of Wildlife and Fisheries, 2016b).
Lafourche Parish	
Wisner WMA	Owned by the Edward Wisner Donation Advisory Committee, the WMA is approximately 21,000 acres of bayous and canals. The WMA is open seasonally for small game and waterfowl hunting.
Point-aux-Chenes WMA	See description under Terrebonne Parish.
Jefferson Parish	
Grand Isle State Park	Part of the Louisiana State Park system, Grand Isle State Park is a small beach ridge which serves as a breakwater between the Gulf of Mexico and the island channels that connect numerous bayous to the Mississippi River. The park is used extensively for swimming, fishing, boating, camping, and bird watching. Saltwater fishing is especially prolific in the waters offshore of the park, with speckled trout and redfish comprising two of the most popular targets (Louisiana Department of Culture Recreation and Tourism, 2015).

Table 1. (Continued).

Wildlife Refuge, Wilderness Area, State or National Park	Resource Description
Plaquemines Parish	
Delta NWR	The Delta NWR was established in 1935 and covers 49,000 acres formed by the deposition of sediment from the Mississippi River. Its lush vegetation is the food source for a multitude of fish, waterfowl, and animals. The Delta NWR is the winter home for hundreds of thousands of snow geese, coots, and ducks. Endangered and threatened species in the NWR include the Piping Plover and the American alligator, which was de-listed as an endangered species in 1987 but remains listed as threatened due to similarity in appearance to the endangered American crocodile. The Delta NWR supports a wide variety of non-listed wildlife species. Tens of thousands of wintering waterfowl utilize the food resources found in the Delta NWR. Large numbers of other bird species can be found in the NWR, with numbers peaking during the spring and fall migrations. Large numbers of wading birds nest on the refuge, and thousands of shorebirds can be found on tidal mudflats and deltaic splays. Numerous furbearers and game mammals are year-round residents, and the marshes and waterways provide year-round and seasonal habitat for a diversity of fish and shellfish species (USFWS, 2017).
Pass-a-Loutre WMA	The Pass-a-Loutre WMA is located in southern Plaquemines Parish at the mouth of the Mississippi River, approximately 10 miles south of Venice, and is accessible only by boat. The area is characterized by river channels with attendant channel banks, natural bayous, and man-made canals interspersed with intermediate and fresh marshes. The area is owned by the Louisiana Department of Wildlife and Fisheries and encompasses approximately 115,000 acres. The area is home to numerous species of shorebirds and other water fowl. Alligators and small mammals are abundant. The inland waters provide habitat for fish, shrimp, and crabs (Louisiana Department of Wildlife and Fisheries, 2016).
Breton NWR	Established in 1904, the Breton NWR is the second oldest NWR in the United States. Historically, the Breton NWR has been the site of a lighthouse station (destroyed by Hurricane Katrina), a quarantine station, a small fishing village, and an oil production facility. The Chandeleur Islands are designated as critical habitat for the endangered Piping Plover, which is a common visitor to the refuge during fall, winter, and spring. The Western Gulf Coast population of Brown Pelicans was de-listed under the Endangered Species Act in 2009. The Brown Pelican is a year-round resident of southeast Louisiana, and the Breton NWR serves as important breeding grounds for these birds. The Breton NWR also provides habitat for colonies of nesting wading birds and seabirds as well as wintering shorebirds and waterfowl. Twenty-three species of seabirds and shorebirds frequently use the refuge, and 13 species nest on the various islands. The most abundant nesters are Brown Pelicans, Laughing Gulls, Royal Gulls, and Caspian and Sandwich Terns. Waterfowl winter near the refuge islands and use the adjacent shallows, marshes, and sounds for feeding and for protection during inclement weather. Redheads and Lesser Scaup account for the majority of waterfowl on the refuge. Other wildlife species found in the NWR include nutria, raccoons, and several species of sea turtles (USFWS, 2018).
St. Bernard Parish	
Breton NWR	See description under Plaquemines Parish.

NWR = National Wildlife Refuge; WMA=Wildlife Management Area.

G. All drilling activities, supplies, and equipment shall be kept on barges, on drilling rigs, within ring levees, or on the well site.

Not applicable; no drilling will occur under the DOCD.

H. Drilling ring levees shall to the maximum extent practicable be replaced with small production levees or removed entirely.

Not applicable; no drilling ring levees will be used during the proposed activities.

I. *All drilling and production equipment, structures, and storage facilities shall be designed and constructed utilizing best practical techniques to withstand all expectable adverse conditions without releasing pollutants.*

Addressed in DOCD Sections 1 and Appendix D.

J. *Mineral exploration, production, and refining facilities shall be designed and constructed using best practical techniques to minimize adverse environmental impacts.*

Addressed in DOCD Sections 1 and 2, and Appendix D.

K. *Effective environmental protection and emergency or contingency plans shall be developed and complied with for all mineral operations.*

Addressed in DOCD Sections 1, 2, 3, and 9, and Appendix D.

L. *The use of dispersants, emulsifiers, and other similar chemical agents on oil spills is prohibited without the prior approval of the Coast Guard or Environmental Protection Agency on-scene coordinator, in accordance with the National Oil and Hazardous Substances Pollution Contingency Plan.*

Addressed in DOCD Section 9.

M. *Mineral exploration and production sites shall be cleared, revegetated, detoxified, and otherwise restored as near as practicable to their original condition upon termination of operations to the maximum extent practicable.*

Addressed in DOCD Sections 1 and 9.

N. *The creation of underwater obstructions which adversely affect fishing or navigation shall be avoided to the maximum extent practicable.*

Addressed in DOCD Section 1.

3 Consistency Certification

The analysis indicates that BP's DOCD for MC 562 is consistent with the enforceable policies of the LCRP according to the guidelines provided by the LCRP. Routine operations will have limited environmental impacts in the immediate vicinity of the proposed activities. Land-based support activities may originate from Louisiana.

In the event of an accidental spill, BP will implement the measures of its Regional OSRP, which details plans and procedures for containment, recovery, and removal of an oil spill. This project is expected to conform to existing regulatory requirements. The DOCD describes the project and related activities, and the EIA analyzes potential environmental impacts. The intent and requirements of enforceable Louisiana Statutes have been considered and discussed as well as other information requirements of Louisiana. A CZMA consistency certification according to 16 U.S.C. 1456(c)(3)(B) and 15 CFR 930.76(c) for Louisiana is provided on the cover page.

4 References

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Appendix G: Service Processing Fee

Receipt

Your payment is complete

Pay.gov Tracking ID: 26BKK6PS
Agency Tracking ID: 75552792623
Form Name: BOEM Development Operations Coordination Document or DPP
Application Name: BOEM Development/DOCD Plan - BD

Payment Information

Payment Type: Debit or credit card
Payment Amount: $4,238.00
Transaction Date: 08/15/2018 06:54:50 PM EDT
Payment Date: 08/15/2018
Region: Gulf of Mexico
Contact: Adalberto Garcia 281-995-2815
Company Name/No: BP Exploration & Production Inc., 02481
Lease Number(s): 19966, , , ,
Area-Block: Mississippi Canyon MC, 562: , : , : , : ,
Type-Wells: Supplemental Plan, 1

Account Information

Cardholder Name: Betsy Cleland
Card Type: Master Card
Card Number: **********8137

Email Confirmation Receipt

Confirmation Receipts have been emailed to:
adalberto.garcia@bp.com