UNITED STATES GOVERNMENT July 29, 2026
MEMORANDUM

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

Subject: Public Information copy of plan

Control #	-	S-08233
Type	-	Supplemental Exploration Plan
Lease(s)	-	OCS-G21811 Block - 679 Green Canyon Area OCS-G22987 Block - 680 Green Canyon Area
Operator	-	Anadarko Petroleum Corporation
Description	-	Subsea Wells in GC 679 & 680
Rig Type	-	Not Found

Attached is a copy of the subject plan.

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

Tehirah Barkum
Plan Coordinator

Site Type/Name	**Botm Lse/Area/Blk**	**Surface Location**	**Surf Lse/Area/Blk**
WELL/U	G22987/GC/680	6240 FNL, 1390 FEL	G22987/GC/680
WELL/UU	G22987/GC/680	6240 FNL, 1340 FEL	G22987/GC/680
WELL/UUU	G22987/GC/680	6240 FNL, 1290 FEL	G22987/GC/680
WELL/V	G21811/GC/679	2208 FSL, 2679 FWL	G22987/GC/680
WELL/V	G22987/GC/680	3297 FNL, 5742 FEL	G22987/GC/680
WELL/VV	G21811/GC/679	2194 FSL, 2699 FWL	G22987/GC/680
WELL/VV	G22987/GC/680	3347 FNL, 5739 FEL	G22987/GC/680
WELL/VVV	G22987/GC/680	3397 FNL, 5736 FEL	G22987/GC/680
WELL/W	G22987/GC/680	730 FSL, 2100 FWL	G22987/GC/680
WELL/W	G21811/GC/679	1940 FNL, 2600 FEL	G21811/GC/679
WELL/WW	G22987/GC/680	780 FSL, 2100 FWL	G22987/GC/680
WELL/WW	G21811/GC/679	1969 FNL, 2559 FEL	G21811/GC/679
WELL/WWW	G22987/GC/680	730 FSL, 2050 FWL	G22987/GC/680
WELL/WWW	G21811/GC/679	1998 FNL, 2518 FEL	G21811/GC/679

,

PUBLIC

SUPPLEMENTAL EXPLORATION PLAN

GREEN CANYON BLOCKS 679, 680
OCS-G21811, OCS-G22987

OFFSHORE, LOUISIANA

Anadarko Petroleum Corporation
1201 Lake Robbins Drive
The Woodlands, Texas 77380
Contact: Teri Powell
Teri_Powell@oxy.com
(832) 636-1261

1 – PDF Copy Confidential
1 – PDF Copy Public Information

July 2026

SUPPLEMENTAL EXPLORATION PLAN
GREEN CANYON BLOCKS 679, 680
OCS-G21811, OCS-G22987

SECTION A
PLAN CONTENTS

(a) Plan Information Form

Under this Supplemental Exploration Plan (EP), Anadarko Petroleum Corporation (Anadarko) proposes to drill and complete 20 wells total:

- **Green Canyon (GC) Block 679:**
  - S*urface location in GC 680* - (V, VV)
  - *Surface location* in GC 679 - (W,WW,WWW,X,XX,XXX,Y,YY,YYY,Z,ZZ,ZZZ)

- **Green Canyon (GC) Block 680:**
  - *Surface location in GC 680* **-** (U, UU, UUU, V, VV, VVV*)*

The wells will be drilled using either a Dynamically Positioned (DP) Drillship or DP Semisubmersible drilling rig. Drilling and completion operations for the proposed well locations will utilize a subsea BOP stack.

There will be no pipe driving activities or new pipelines expected to make landfall under this plan.

OCS Plan Information Form BOEM-137 is enclosed as **Attachment A-1.**

(b) Location

Enclosed as **Attachment A-2** is a well location plat at a scale of 1" = 2,000' that depicts the surface location and water depth of the proposed wells.

(c) Safety and Pollution Prevention Features

Safety features on the drilling unit will include well control, pollution prevention, safe welding procedures, and blowout prevention equipment as described in Title 30 CFR Part 250, Subparts C, D, E, G and O; and as further clarified by BOEM Notices to Lessees, and applicable regulations of the Environmental Protection Agency and the U.S. Coast Guard. The appropriate life rafts, life jackets, ring buoys, etc., as prescribed by the U.S. Coast Guard, will be maintained on the facility at all times.

(d) Storage Tanks and Production Vessels

The proposed wells will be drilled with either a DP drillship or DP semisubmersible unit. The storage tanks represented below reflect the largest tank capacities from MODU's under contract. Another MODU or vessel may be utilized during operations, but will have a total storage tank capacity equal to or less than the following:

Type of Facility	Type Of Storage Tank	Tank Capacity	Number Of Tanks	Total Capacity	Fluid Gravity (Api)	Total Capacity of all Tanks for Rig Type
DP Drillship	Hydrocarbons/Fuel Oil Storage Tank	5,514 bbls	2	11,028 bbls	No. 2 Diesel/ varies	**12 tanks total= 62,874 bbls**
	Hydrocarbons/Fuel Oil Storage Tank	12,458 bbls	2	24,916 bbls	No. 2 Diesel/ varies	
	Hydrocarbons/Fuel Oil Storage Tank	12,065 bbls	2	24,130 bbls	No. 2 Diesel/ varies	
	Fuel Oil Settling Tanks	640 bbls	2	1,280 bbls	No. 2 Diesel	
	Fuel Oil Service Tanks	480 bbls	3	1,440 bbls	No. 2 Diesel	
	Fuel Oil Emergency Generator Tank	80 bbls	1	80 bbls	No. 2 Diesel	
DP Semi	Hydrocarbon/Fuel Oil Hull Tanks	4,541 bbls	2	9,082 bbls	No. 2 Diesel/ varies	**7 tanks total= 16,689 bbls**
	Hydrocarbon/Fuel Oil Hull Tanks	3,392 bbls	2	6,784 bbls	No. 2 Diesel/ varies	
	Fuel Oil Deck Day Tank	629 bbls	1	629 bbls	No. 2 Diesel	
	Fuel Oil Deck Settling Tank	164 bbls	1	164 bbls	No. 2 Diesel	
	Fuel Oil Emergency Generator	30 bbls	1	30 bbls	No. 2 Diesel	

(e) Pollution Prevention Measures

The drilling rig utilized for these operations will comply with all applicable regulations regarding pollution prevention and control. The rig has a Shipboard Oil Pollution Emergency Plan (SOPEP), which is reviewed and approved annually by the American Bureau of Shipping (ABS). The SOPEP is provided to assist employees in dealing with an unexpected discharge of oil. Its primary purpose is to set in motion the necessary actions to stop or minimize the discharge of oil and to mitigate its effects. Effective planning ensures that the necessary actions are taken in a structured, logicalm and timely manner.

Pollution prevention measures include installation of curbs, gutters, drip pans, and drains on deck areas to collect all contaminants and debris. Most deck drains and some of the joints at the edge of the rig floor go overboard or into the moonpool, respectively. To prevent ocean discharge from the drains there is a dedicated drip pan under the rotary table. The pipe racks, mud pump room, sack store, and drill floor drains go to a holding tank, which is served by a dedicated oily water separator. The well test area, engine room, and other major machinery spaces drains all go to slops tanks, which are served by a large general-service, oily water separator. The containment devices are temporary. They are not meant for permanent storage of waste. On the rare occasion that they contain wastes, they are pumped, mopped, or cleaned within a short period of time. The chances of damage to a containment structure during such time as it contains wastes are exceedingly small.

(f) Additional Pollution Prevention Measures

No additional measures are proposed under this plan. The activities proposed in this plan are not located offshore Florida.

(g) Description of Previously Approved Lease Activities

Anadarko US Offshore LLC (formerly Kerr-McGee Oil & Gas Corporation) obtained approval on August 21, 2001, for the following well locations under an Initial EP that includes GC 680, OCS-G22987 (Plan Control No.: N-7191):

Well Location	Status of Well Location	Potential Future Operations
A	Approved Kerr-McGee well location, pre-2010	N/A
B	Approved Kerr-McGee well location, pre-2010	N/A

Anadarko US Offshore LLC (formerly Kerr-McGee Oil & Gas Corporation) obtained approval on July 24, 2002, for the following well location under a Revised EP that includes GC 680, OCS-G22987 (Plan Control No.: R-3820):

Well Location	Status of Well Location	Potential Future Operations
B	Approved Kerr-McGee well location, pre-2010	N/A

Anadarko US Offshore LLC (formerly Kerr-McGee Oil & Gas Corporation) obtained approval on October 21, 2002, for the following well location under a Supplemental EP that includes GC 680, OCS-G22987 (Plan Control No.: S-6025):

Well Location	Status of Well Location	Potential Future Operations
C	Approved Kerr-McGee well location, pre-2010	N/A
D	Approved Kerr-McGee well location, pre-2010	N/A

Anadarko US Offshore LLC (formerly Kerr-McGee Oil & Gas Corporation) obtained approval on December 23, 2003, for the following well location under a Supplemental EP that includes GC 680, OCS-G22987 (Plan Control No.: S-6311):

Well Location	Status of Well Location	Potential Future Operations
E	Approved Kerr-McGee well location, pre-2010	N/A
F	Approved Kerr-McGee well location, pre-2010	N/A

Anadarko US Offshore LLC (formerly Kerr-McGee Oil & Gas Corporation) obtained approval on July 14, 2004, for the following well location under a Supplemental EP that includes GC 680, OCS-G22987 (Plan Control No.: S-6458):

Well Location	Status of Well Location	Potential Future Operations
G	Approved Kerr-McGee well location, pre-2010	N/A

Anadarko US Offshore LLC (formerly Kerr-McGee Oil & Gas Corporation) obtained approval on August 24, 2004, for the following well location under a Supplemental EP that includes GC 679, OCS-G21811 and GC 680, OCS-G22987 (Plan Control No.: S-6486):

Well Location	Status of Well Location	Potential Future Operations
C	Approved Kerr-McGee well location, pre-2010	N/A

Anadarko US Offshore LLC (formerly Kerr-McGee Oil & Gas Corporation) obtained approval on October 6, 2006, for the following well location under a Supplemental EP that includes GC 680, OCS-G22987 (Plan Control No.: S-6961):

Well Location	Status of Well Location	Potential Future Operations
I	Approved Kerr-McGee well location, pre-2010	N/A
J	Approved Kerr-McGee well location, pre-2010	N/A

Anadarko Petroleum Corporation obtained approval on January 18, 2013, for the following well locations under a Revised DOCD that includes GC 679, OCS-G21811 and 680, OCS-G22987 (Plan Control No.: R-5713):

Well Location	Status of Well Location	Potential Future Operations
A001 ST04 GC 679 BHL	Completed in 2014, on production.	N/A, well producing.
A006 ST03	Completed in 2013, on production.	N/A, well producing.

Anadarko Petroleum Corporation obtained approval on October 25, 2024, for the following well locations under an Initial Exploration Plan that includes 680, OCS-G22987 (Plan Control No.: N-10245):

Well Location	Status of Well Location	Potential Future Operations
W	Approved well location for future utility	Future drill location
WW	Approved well location for future utility	Future drill location
WWW	Approved well location for future utility	Future drill location
X	Approved well location for future utility	Future drill location
XX	Approved well location for future utility	Future drill location
XXX	Approved well location for future utility	Future drill location
Y	Location utilized to drill GC 680 008 ST00BP00	Future completion
YY	Approved well location for future utility	Future drill location
YYY	Approved well location for future utility	Future drill location
Z	Approved well location for future utility	Future drill location
ZZ	Approved well location for future utility	Future drill location
ZZZ	Approved well location for future utility	Future drill location

OCS PLAN INFORMATION FORM

General Information

Type of OCS Plan:	X	Exploration Plan (EP)	Development Operations Coordination Document (DOCD)	

Company Name: Anadarko Petroleum Corporation	BOEM Operator Number: 00981
Address:	Contact Person: Teri Powell
1201 Lake Robbins Drive	Phone Number: 832-636-1261
The Woodlands, TX 77380	E-Mail Address: Teri_Powell@oxy.com

If a service fee is required under 30 CFR 550.125(a), provide the	Amount paid	$33,761.00	Receipt No.	77429126454 77428958497

Project and Worst Case Discharge (WCD) Information

Lease(s): G21811,G22987	Area: GC	Block: 679,680	Project Name (If Applicable): Bandit

Objective(s)	X	Oil	X	Gas		Sulphur		Salt	Onshore Support Base(s): Fourchon,Broussard,Houma,Lake Charles, LA or Galveston,TX

Platform/Well Name: GC 680 Y	Total Volume of WCD: 321,368 bopd	API Gravity: 26.8

Distance to Closest Land (Miles): 119 miles	Volume from uncontrolled blowout: 29,244,488 bbls

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	N-10245			
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
See attached activity schedule.			

Description of Drilling Rig

	Jackup	X	Drillship
	Gorilla Jackup		Platform rig
	Semisubmersible		Submersible
X	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)
N/A			

Attachment A-1

Bandit Supplemental EP Proposed Activity Schedule - GC 679, 680

PLAN - NEW Proposed Activity		Proposed Vessel Type	Estimated Start Date	Estimated End Date	Max. Anticipated No. of Days
Surface Location GC 679					
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 W		MODU	1/1/2027	7/20/2027	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 X		MODU	2/1/2028	8/19/2028	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 Y		MODU	3/1/2029	9/17/2029	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 Z		MODU	4/1/2030	10/18/2030	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 WW		MODU	1/1/2031	7/20/2031	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 XX		MODU	2/1/2032	8/19/2032	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 YY		MODU	3/1/2033	9/17/2033	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 ZZ		MODU	4/1/2034	10/18/2034	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 WWW		MODU	1/1/2035	7/20/2035	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 XXX		MODU	2/1/2036	8/19/2036	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 YYY		MODU	3/1/2037	9/17/2037	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 ZZZ		MODU	4/1/2038	10/18/2038	200 days
Surface Location GC 680					
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 V		MODU	4/1/2038	10/18/2038	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 U		MODU	1/1/2039	7/20/2039	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 V		MODU	2/1/2040	8/19/2040	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 VV		MODU	3/1/2041	9/17/2041	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 UU		MODU	4/1/2042	10/18/2042	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 VV		MODU	1/1/2043	7/20/2043	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 UUU		MODU	2/1/2044	8/19/2044	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 VVV		MODU	3/1/2045	9/17/2045	200 days
Previously Approved Locations with AQR's Being Brought Forward Plan Control No. N-10245	**Plan Control No.**	**Proposed Vessel Type**	**Estimated Start Date**	**Estimated End Date**	**Max. Anticipated No. of Days**
Surface Location GC 680					
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 W	N-10245	MODU	1/1/2027	7/20/2027	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 X	N-10245	MODU	2/1/2028	8/19/2028	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 Z	N-10245	MODU	3/1/2029	9/17/2029	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 YY	N-10245	MODU	4/1/2030	10/18/2030	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 WW	N-10245	MODU	1/1/2031	7/20/2031	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 XX	N-10245	MODU	2/1/2032	8/19/2032	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 ZZ	N-10245	MODU	3/1/2033	9/17/2033	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 YYY	N-10245	MODU	4/1/2034	10/18/2034	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 WWW	N-10245	MODU	1/1/2035	7/20/2035	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 XXX	N-10245	MODU	2/1/2036	8/19/2036	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 ZZZ	N-10245	MODU	3/1/2037	9/17/2037	200 days

** The Activity Schedule is denoted for optionaility, start date may change in the future.*
Not all locations may be drilled in a year and denoted for air emission coverage.

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): GC 679 "V"	Previously reviewed under an approved EP or DOCD?		Yes	X	No
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No. N/A
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?		X	Yes		No

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

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G 22987	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	680		
Blockline Departures (in feet)	N/S Departure: F____ L 2,208 FSL	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F____ L 2,679 FWL	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,299,479	X:	X: X: X:
	Y: 9,902,208	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.273576	Latitude	Latitude Latitude Latitude
	Longitude -90.970635	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 5,015'	MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

<table>
<tr><th colspan="8">Proposed Well/Structure Location</th></tr>
<tr><td colspan="3">Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 679 "VV"</td><td colspan="2">Previously reviewed under an approved EP or DOCD?</td><td>Yes</td><td>X</td><td>No</td></tr>
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<tr><td></td><td colspan="2">Surface Location</td><td colspan="2">Bottom-Hole Location (For Wells)</td><td colspan="3">Completion (For multiple completions, enter separate lines)</td></tr>
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OCS</td></tr>
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Longitude</td></tr>
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MD (Feet):
MD (Feet):</td><td rowspan="2">TVD (Feet):
TVD (Feet):
TVD (Feet):</td></tr>
<tr><td colspan="4">Anchor Radius (if applicable) in feet:</td><td>N/A</td></tr>
</table>

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location							
Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 679 "W"		Previously reviewed under an approved EP or DOCD?			Yes	X	No
Is this an existing well or structure?	Yes	No X	If this is an existing well or structure, list the Complex ID or API No.		N/A		
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?				X	Yes		No
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A		For structures, volume of all storage and pipelines (Bbls): N/A		API Gravity of fluid		

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**	
Lease No.	OCS G 21811	OCS	OCS OCS	
Area Name	Green Canyon			
Block No.	679			
Blockline Departures (in feet)	N/S Departure: F____ L 1,940 FNL	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L	
	E/W Departure: F____ L 2,600 FEL	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L	
Lambert X-Y coordinates	X: 2,294,200	X:	X: X: X:	
	Y: 9,913,900	Y:	Y: Y: Y:	
Latitude/ Longitude	Latitude 27.305966	Latitude	Latitude Latitude Latitude	
	Longitude -90.986302	Longitude	Longitude Longitude Longitude	
Water Depth (Feet): 4,652'		MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): TVD (Feet): MD (Feet): TVD (Feet): MD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:		N/A		

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 679 "WW"	Previously reviewed under an approved EP or DOCD?		Yes	X	No
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No. N/A
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?	X	Yes		No	

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

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G 21811	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	679		
Blockline Departures (in feet)	N/S Departure: F____ L 1,969 FNL	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F____ L 2,559 FEL	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,294,241	X:	X: X: X:
	Y: 9,913,871	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.305884	Latitude	Latitude Latitude Latitude
	Longitude -90.986177	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 4,652'	MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location							
Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 679 "WWW"			Previously reviewed under an approved EP or DOCD?		Yes	X	No
Is this an existing well or structure?		Yes	No X	If this is an existing well or structure, list the Complex ID or API No.	N/A		
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?				X	Yes		No
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A		For structures, volume of all storage and pipelines (Bbls): N/A		API Gravity of fluid		

	Surface Location		**Bottom-Hole Location (For Wells)**		**Completion (For multiple completions, enter separate lines)**	
Lease No.	OCS G 21811		OCS		OCS OCS	
Area Name	Green Canyon					
Block No.	679					
Blockline Departures (in feet)	N/S Departure: F____ L 1,998 FNL		N/S Departure: F____ L		N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L	
	E/W Departure: F____ L 2,518 FEL		E/W Departure: F____ L		E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L	
Lambert X-Y coordinates	X: 2,294,282		X:		X: X: X:	
	Y: 9,913,842		Y:		Y: Y: Y:	
Latitude/ Longitude	Latitude 27.305803		Latitude		Latitude Latitude Latitude	
	Longitude -90.986052		Longitude		Longitude Longitude Longitude	
Water Depth (Feet): 4,652'			MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:		N/A				

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

OCS PLAN INFORMATION FORM (CONTINUED)

Include one copy of this page for each proposed well/structure

Proposed Well/Structure Location							
Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 679 "X"		Previously reviewed under an approved EP or DOCD?			Yes	X	No
Is this an existing well or structure?		Yes	No X	If this is an existing well or structure, list the Complex ID or API No.	N/A		
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?				X	Yes		No
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A		For structures, volume of all storage and pipelines (Bbls): N/A		API Gravity of fluid		

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G 21811	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	679		
Blockline Departures (in feet)	N/S Departure: F____ L 4,294 FSL	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F____ L 2,180 FEL	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,294,620	X:	X: X: X:
	Y: 9,904,294	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.279529	Latitude	Latitude Latitude Latitude
	Longitude -90.985486	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 4,848'	MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A			

Anchor Locations for Drilling Rig or Construction Barge (**If anchor radius supplied above, not necessary**)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 679 "XX"	Previously reviewed under an approved EP or DOCD?		Yes	X	No
Is this an existing well or structure?		Yes	No X	If this is an existing well or structure, list the Complex ID or API No.	N/A
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?	X	Yes		No	

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

	Surface Location	Bottom-Hole Location (For Wells)	Completion (For multiple completions, enter separate lines)
Lease No.	OCS G 21811	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	679		
Blockline Departures (in feet)	N/S Departure: F____ L 4,261 FSL	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F____ L 2,144 FEL	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,294,656	X:	X: X: X:
	Y: 9,904,261	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.279436	Latitude	Latitude Latitude Latitude
	Longitude -90.985376	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 4,848'	MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 679 "XXX"	Previously reviewed under an approved EP or DOCD?		Yes	X	No	
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.	N/A
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?	X	Yes		No		
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A	For structures, volume of all storage and pipelines (Bbls): N/A	API Gravity of fluid			

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G 21811	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	679		
Blockline Departures (in feet)	N/S Departure: F____ L 4,228 FSL	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F____ L 2,108 FEL	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,294,692	X:	X: X: X:
	Y: 9,904,228	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.279344	Latitude	Latitude Latitude Latitude
	Longitude -90.985267	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 4,848'	MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 679 "Y"	Previously reviewed under an approved EP or DOCD?		Yes	X No
Is this an existing well or structure?	Yes	No X	If this is an existing well or structure, list the Complex ID or API No.	N/A
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?	X Yes		No	

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

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G 21811	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	679		
Blockline Departures (in feet)	N/S Departure: F____ L 3,900 FSL	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F____ L 2,250 FEL	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,294,550	X:	X: X: X:
	Y: 9,903,900	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.278448	Latitude	Latitude Latitude Latitude
	Longitude -90.985721	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 4,852'	MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 679 "YY"	Previously reviewed under an approved EP or DOCD?		Yes	X	No

Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.	N/A

Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?	X	Yes		No

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

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G 21811	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	679		
Blockline Departures (in feet)	N/S Departure: F____ L 3,893 FSL	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F____ L 2,200 FEL	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,294,600	X:	X: X: X:
	Y: 9,903,893	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.278427	Latitude	Latitude Latitude Latitude
	Longitude -90.985567	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 4,852'	MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

<table>
<tr><th colspan="10">Proposed Well/Structure Location</th></tr>
<tr><td colspan="3">Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 679 "YYY"</td><td colspan="3">Previously reviewed under an approved EP or DOCD?</td><td></td><td>Yes</td><td>X</td><td>No</td></tr>
<tr><td>Is this an existing well or structure?</td><td></td><td>Yes</td><td></td><td>No X</td><td colspan="2">If this is an existing well or structure, list the Complex ID or API No.</td><td colspan="3">N/A</td></tr>
<tr><td colspan="6">Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?</td><td>X</td><td>Yes</td><td></td><td>No</td></tr>
<tr><td>WCD info</td><td colspan="2">For wells, volume of uncontrolled blowout (Bbls/day): N/A</td><td colspan="3">For structures, volume of all storage and pipelines (Bbls): N/A</td><td colspan="2">API Gravity of fluid</td><td colspan="2"></td></tr>
<tr><td></td><td colspan="2">Surface Location</td><td colspan="3">Bottom-Hole Location (For Wells)</td><td colspan="4">Completion (For multiple completions, enter separate lines)</td></tr>
<tr><td>Lease No.</td><td colspan="2">OCS
G 21811</td><td colspan="3">OCS</td><td colspan="4">OCS
OCS</td></tr>
<tr><td>Area Name</td><td colspan="2">Green Canyon</td><td colspan="3"></td><td colspan="4"></td></tr>
<tr><td>Block No.</td><td colspan="2">679</td><td colspan="3"></td><td colspan="4"></td></tr>
<tr><td rowspan="2">Blockline Departures (in feet)</td><td colspan="2">N/S Departure: F____ L
3,886 FSL</td><td colspan="3">N/S Departure: F____ L</td><td colspan="4">N/S Departure: F____ L
N/S Departure: F____ L
N/S Departure: F____ L</td></tr>
<tr><td colspan="2">E/W Departure: F____ L
2,150 FEL</td><td colspan="3">E/W Departure: F____ L</td><td colspan="4">E/W Departure: F____ L
E/W Departure: F____ L
E/W Departure: F____ L</td></tr>
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X:
X:</td></tr>
<tr><td colspan="2">Y:
9,903,886</td><td colspan="3">Y:</td><td colspan="4">Y:
Y:
Y:</td></tr>
<tr><td rowspan="2">Latitude/ Longitude</td><td colspan="2">Latitude
27.278405</td><td colspan="3">Latitude</td><td colspan="4">Latitude
Latitude
Latitude</td></tr>
<tr><td colspan="2">Longitude
-90.985414</td><td colspan="3">Longitude</td><td colspan="4">Longitude
Longitude
Longitude</td></tr>
<tr><td colspan="3">Water Depth (Feet):
4,852'</td><td>MD (Feet):
N/A</td><td colspan="2">TVD (Feet):
N/A</td><td rowspan="2" colspan="2">MD (Feet):
MD (Feet):
MD (Feet):</td><td rowspan="2" colspan="2">TVD (Feet):
TVD (Feet):
TVD (Feet):</td></tr>
<tr><td colspan="4">Anchor Radius (if applicable) in feet:</td><td colspan="2">N/A</td></tr>
</table>

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location							
Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 679 "Z"			Previously reviewed under an approved EP or DOCD?		Yes	X	No
Is this an existing well or structure?		Yes	No X	If this is an existing well or structure, list the Complex ID or API No.	N/A		
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?				X	Yes		No
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A		For structures, volume of all storage and pipelines (Bbls): N/A		API Gravity of fluid		
	Surface Location		**Bottom-Hole Location (For Wells)**		**Completion (For multiple completions, enter separate lines)**		
Lease No.	OCS G 21811		OCS		OCS OCS		
Area Name	Green Canyon						
Block No.	679						
Blockline Departures (in feet)	N/S Departure: F____ L 4,225 FSL		N/S Departure: F____ L		N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L		
	E/W Departure: F____ L 2,625 FEL		E/W Departure: F____ L		E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L		
Lambert X-Y coordinates	X: 2,294,175		X:		X: X: X:		
	Y: 9,904,225		Y:		Y: Y: Y:		
Latitude/ Longitude	Latitude 27.279359		Latitude		Latitude Latitude Latitude		
	Longitude -90.986859		Longitude		Longitude Longitude Longitude		
Water Depth (Feet): 4,834'			MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):	
Anchor Radius (if applicable) in feet:			N/A				

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

<table>
<tr><td colspan="2">Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 679 "ZZ"</td><td colspan="2">Previously reviewed under an approved EP or DOCD?</td><td></td><td>Yes</td><td>X</td><td>No</td></tr>
<tr><td>Is this an existing well or structure?</td><td></td><td>Yes</td><td>No X</td><td colspan="2">If this is an existing well or structure, list the Complex ID or API No.</td><td colspan="2">N/A</td></tr>
<tr><td colspan="4">Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?</td><td>X</td><td>Yes</td><td></td><td>No</td></tr>
</table>

<table>
<tr><td>WCD info</td><td>For wells, volume of uncontrolled blowout (Bbls/day): N/A</td><td>For structures, volume of all storage and pipelines (Bbls): N/A</td><td>API Gravity of fluid</td><td></td></tr>
</table>

<table>
<tr><td></td><td colspan="2">Surface Location</td><td colspan="2">Bottom-Hole Location (For Wells)</td><td colspan="2">Completion (For multiple completions, enter separate lines)</td></tr>
<tr><td>Lease No.</td><td colspan="2">OCS
G 21811</td><td colspan="2">OCS</td><td colspan="2">OCS
OCS</td></tr>
<tr><td>Area Name</td><td colspan="2">Green Canyon</td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td>Block No.</td><td colspan="2">679</td><td colspan="2"></td><td colspan="2"></td></tr>
<tr><td rowspan="2">Blockline Departures (in feet)</td><td colspan="2">N/S Departure: F____ L
4,176 FSL</td><td colspan="2">N/S Departure: F____ L</td><td colspan="2">N/S Departure: F____ L
N/S Departure: F____ L
N/S Departure: F____ L</td></tr>
<tr><td colspan="2">E/W Departure: F____ L
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E/W Departure: F____ L
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X:
X:</td></tr>
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Y:
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Longitude
Longitude</td></tr>
<tr><td colspan="3">Water Depth (Feet):
4,834'</td><td>MD (Feet):
N/A</td><td>TVD (Feet):
N/A</td><td rowspan="2">MD (Feet):
MD (Feet):
MD (Feet):</td><td rowspan="2">TVD (Feet):
TVD (Feet):
TVD (Feet):</td></tr>
<tr><td colspan="3">Anchor Radius (if applicable) in feet:</td><td colspan="2">N/A</td></tr>
</table>

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 679 "ZZZ"	Previously reviewed under an approved EP or DOCD?		Yes	X	No
Is this an existing well or structure?		Yes	No X	If this is an existing well or structure, list the Complex ID or API No.	N/A
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?	X	Yes		No	

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

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G 21811	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	679		
Blockline Departures (in feet)	N/S Departure: F____ L 4,127 FSL	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F____ L 2,623 FEL	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,294,177	X:	X: X: X:
	Y: 9,904,127	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.279089	Latitude	Latitude Latitude Latitude
	Longitude -90.986857	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 4,834'	MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 "U"	Previously reviewed under an approved EP or DOCD?		Yes	X	No	
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.	N/A
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?	X	Yes		No		
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A	For structures, volume of all storage and pipelines (Bbls): N/A	API Gravity of fluid			

	Surface Location	Bottom-Hole Location (For Wells)	Completion (For multiple completions, enter separate lines)
Lease No.	OCS G 22987	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	680		
Blockline Departures (in feet)	N/S Departure: F____ L 6,240 FNL	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F____ L 1,390 FEL	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,311,250	X:	X: X: X:
	Y: 9,909,600	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.293374	Latitude	Latitude Latitude Latitude
	Longitude -90.934033	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 5,405'	MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 "UU"		Previously reviewed under an approved EP or DOCD?			Yes	X	No
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.	N/A	
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?				X	Yes		No
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A		For structures, volume of all storage and pipelines (Bbls): N/A		API Gravity of fluid		

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G 22987	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	680		
Blockline Departures (in feet)	N/S Departure: F____ L 6,240 FNL	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F____ L 1,340 FEL	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,311,300	X:	X: X: X:
	Y: 9,909,600	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.293372	Latitude	Latitude Latitude Latitude
	Longitude -90.933879	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 5,405'	MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location					
Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 "UUU"	Previously reviewed under an approved EP or DOCD?		Yes	X	No

Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No. N/A
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?	X	Yes		No	

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

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**	
Lease No.	OCS G 22987	OCS	OCS OCS	
Area Name	Green Canyon			
Block No.	680			
Blockline Departures (in feet)	N/S Departure: F____ L 6,240 FNL	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L	
	E/W Departure: F____ L 1,290 FEL	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L	
Lambert X-Y coordinates	X: 2,311,350	X:	X: X: X:	
	Y: 9,909,600	Y:	Y: Y: Y:	
Latitude/ Longitude	Latitude 27.293370	Latitude	Latitude Latitude Latitude	
	Longitude -90.933725	Longitude	Longitude Longitude Longitude	
Water Depth (Feet): 5,405'		MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): TVD (Feet): MD (Feet): TVD (Feet): MD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:		N/A		

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 "V"	Previously reviewed under an approved EP or DOCD?		Yes	X	No	
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.	N/A
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?	X	Yes		No		
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A	For structures, volume of all storage and pipelines (Bbls): N/A	API Gravity of fluid			

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G 22987	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	680		
Blockline Departures (in feet)	N/S Departure: F____ L 3,297 FNL	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F____ L 5,742 FEL	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,306,898	X:	X: X: X:
	Y: 9,912,543	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.301665	Latitude	Latitude Latitude Latitude
	Longitude -90.947280	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 5,223'	MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

<table>
<tr><th colspan="6">Proposed Well/Structure Location</th></tr>
<tr><td colspan="2">Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 "VV"</td><td colspan="2">Previously reviewed under an approved EP or DOCD?</td><td>Yes</td><td>X No</td></tr>
<tr><td>Is this an existing well or structure?</td><td>Yes</td><td>No X</td><td colspan="2">If this is an existing well or structure, list the Complex ID or API No.</td><td>N/A</td></tr>
<tr><td colspan="4">Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?</td><td>X Yes</td><td>No</td></tr>
<tr><td>WCD info</td><td colspan="2">For wells, volume of uncontrolled blowout (Bbls/day): N/A</td><td colspan="2">For structures, volume of all storage and pipelines (Bbls): N/A</td><td>API Gravity of fluid</td></tr>
</table>

	Surface Location	Bottom-Hole Location (For Wells)	Completion (For multiple completions, enter separate lines)
Lease No.	OCS G 22987	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	680		
Blockline Departures (in feet)	N/S Departure: F____ L 3,347 FNL	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F____ L 5,739 FEL	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,306,901	X:	X: X: X:
	Y: 9,912,493	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.301528	Latitude	Latitude Latitude Latitude
	Longitude -90.947273	Longitude	Longitude Longitude Longitude

<table>
<tr><td>Water Depth (Feet):
5,223'</td><td>MD (Feet):
N/A</td><td>TVD (Feet):
N/A</td><td rowspan="2">MD (Feet):
MD (Feet):
MD (Feet):</td><td rowspan="2">TVD (Feet):
TVD (Feet):
TVD (Feet):</td></tr>
<tr><td>Anchor Radius (if applicable) in feet:</td><td colspan="2">N/A</td></tr>
</table>

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 "VVV"	Previously reviewed under an approved EP or DOCD?		Yes	X	No

Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.	N/A

Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?	X	Yes		No

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

	Surface Location		**Bottom-Hole Location (For Wells)**		**Completion (For multiple completions, enter separate lines)**	
Lease No.	OCS G 22987		OCS		OCS OCS	
Area Name	Green Canyon					
Block No.	680					
Blockline Departures (in feet)	N/S Departure: F____ L 3,397 FNL		N/S Departure: F____ L		N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L	
	E/W Departure: F____ L 5,736 FEL		E/W Departure: F____ L		E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L	
Lambert X-Y coordinates	X: 2,306,904		X:		X: X: X:	
	Y: 9,912,443		Y:		Y: Y: Y:	
Latitude/ Longitude	Latitude 27.301390		Latitude		Latitude Latitude Latitude	
	Longitude -90.947266		Longitude		Longitude Longitude Longitude	
Water Depth (Feet): 5,223'			MD (Feet): N/A	TVD (Feet): N/A	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:		N/A				

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

<table>
<tr><th colspan="8">Proposed Well/Structure Location</th></tr>
<tr><td colspan="3">Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 W</td><td colspan="2">Previously reviewed under an approved EP or DOCD?</td><td>X</td><td>Yes</td><td>No N-10245</td></tr>
<tr><td>Is this an existing well or structure?</td><td></td><td>Yes</td><td>No X</td><td colspan="2">If this is an existing well or structure, list the Complex ID or API No.</td><td colspan="2"></td></tr>
<tr><td colspan="5">Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?</td><td>X</td><td>Yes</td><td>No</td></tr>
<tr><td>WCD info</td><td colspan="2">For wells, volume of uncontrolled blowout (Bbls/day): N/A</td><td colspan="2">For structures, volume of all storage and pipelines (Bbls): N/A</td><td colspan="2">API Gravity of fluid</td><td>26.8</td></tr>
<tr><td></td><td colspan="2">Surface Location</td><td colspan="3">Bottom-Hole Location (For Wells)</td><td colspan="2">Completion (For multiple completions, enter separate lines)</td></tr>
<tr><td>Lease No.</td><td colspan="2">OCS G22987</td><td colspan="3">OCS</td><td colspan="2">OCS
OCS</td></tr>
<tr><td>Area Name</td><td colspan="2">Green Canyon</td><td colspan="3"></td><td colspan="2"></td></tr>
<tr><td>Block No.</td><td colspan="2">680</td><td colspan="3"></td><td colspan="2"></td></tr>
<tr><td rowspan="2">Blockline Departures (in feet)</td><td colspan="2">N/S Departure: F S L
730'</td><td colspan="3">N/S Departure: F____ L</td><td colspan="2">N/S Departure: F____ L
N/S Departure: F____ L
N/S Departure: F____ L</td></tr>
<tr><td colspan="2">E/W Departure: F W L
2,100'</td><td colspan="3">E/W Departure: F____ L</td><td colspan="2">E/W Departure: F____ L
E/W Departure: F____ L
E/W Departure: F____ L</td></tr>
<tr><td rowspan="2">Lambert X-Y coordinates</td><td colspan="2">X:
2,298,900</td><td colspan="3">X:</td><td colspan="2">X:
X:
X:</td></tr>
<tr><td colspan="2">Y:
9,900,730</td><td colspan="3">Y:</td><td colspan="2">Y:
Y:
Y:</td></tr>
<tr><td rowspan="2">Latitude/ Longitude</td><td colspan="2">Latitude
27.269537</td><td colspan="3">Latitude</td><td colspan="2">Latitude
Latitude
Latitude</td></tr>
<tr><td colspan="2">Longitude
-90.972491</td><td colspan="3">Longitude</td><td colspan="2">Longitude
Longitude
Longitude</td></tr>
<tr><td colspan="3">Water Depth (Feet):
5,019</td><td>MD (Feet):</td><td colspan="2">TVD (Feet):</td><td rowspan="2">MD (Feet):
MD (Feet):
MD (Feet):</td><td rowspan="2">TVD (Feet):
TVD (Feet):
TVD (Feet):</td></tr>
<tr><td colspan="4">Anchor Radius (if applicable) in feet:</td><td colspan="2">N/A-DP Drillship or DP Semi</td></tr>
</table>

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location						
Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 WW		Previously reviewed under an approved EP or DOCD?	X	Yes		No N-10245
Is this an existing well or structure?		Yes	No X	If this is an existing well or structure, list the Complex ID or API No.		
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?			X	Yes		No
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A		For structures, volume of all storage and pipelines (Bbls): N/A		API Gravity of fluid	26.8

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G22987	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	680		
Blockline Departures (in feet)	N/S Departure: F S L 780'	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F W L 2,100'	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,298,900	X:	X: X: X:
	Y: 9,900,780	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.269674	Latitude	Latitude Latitude Latitude
	Longitude -90.972488	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 5,019	MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A-DP Drillship or DP Semi			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location							
Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 WWW			Previously reviewed under an approved EP or DOCD?	X	Yes		No N-10245
Is this an existing well or structure?		Yes	No X	If this is an existing well or structure, list the Complex ID or API No.			
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?				X	Yes		No
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A		For structures, volume of all storage and pipelines (Bbls): N/A		API Gravity of fluid		26.8

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G22987	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	680		
Blockline Departures (in feet)	N/S Departure: F S L 730'	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F W L 2,050'	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,298,850	X:	X: X: X:
	Y: 9,900,730	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.269539	Latitude	Latitude Latitude Latitude
	Longitude -90.972645	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 5,019		MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A-DP Drillship or DP Semi				

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 X	Previously reviewed under an approved EP or DOCD?	X	Yes		No N-10245

Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.

Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?	X	Yes		No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A	For structures, volume of all storage and pipelines (Bbls): N/A	API Gravity of fluid	26.8

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G22987	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	680		
Blockline Departures (in feet)	N/S Departure: F S L 2,350'	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F W L 3,100'	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,299,900	X:	X: X: X:
	Y: 9,902,350	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.273947	Latitude	Latitude Latitude Latitude
	Longitude -90.969332	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 5,022	MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A-DP Drillship or DP Semi			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 XX	Previously reviewed under an approved EP or DOCD?	X Yes		No N-10245

Is this an existing well or structure?		Yes	No X	If this is an existing well or structure, list the Complex ID or API No.	
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?			X Yes		No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A	For structures, volume of all storage and pipelines (Bbls): N/A	API Gravity of fluid	26.8

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G22987	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	680		
Blockline Departures (in feet)	N/S Departure: F_S_L 2,300'	N/S Departure: F____L	N/S Departure: F____L N/S Departure: F____L N/S Departure: F____L
	E/W Departure: F_W_L 3,100'	E/W Departure: F____L	E/W Departure: F____L E/W Departure: F____L E/W Departure: F____L
Lambert X-Y coordinates	X: 2,299,900	X:	X: X: X:
	Y: 9,902,300	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.273810	Latitude	Latitude Latitude Latitude
	Longitude -90.969335	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 5,022	MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A-DP Drillship or DP Semi			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 XXX		Previously reviewed under an approved EP or DOCD?	X	Yes		No N-10245	
Is this an existing well or structure?		Yes	No X	If this is an existing well or structure, list the Complex ID or API No.			
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?			X	Yes		No	
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A		For structures, volume of all storage and pipelines (Bbls): N/A		API Gravity of fluid	26.8	

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G22987	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	680		
Blockline Departures (in feet)	N/S Departure: F S L 2,250'	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F W L 3,100'	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,299,900	X:	X: X: X:
	Y: 9,902,250	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.273672	Latitude	Latitude Latitude Latitude
	Longitude -90.969337	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 5,022	MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A-DP Drillship or DP Semi			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

<table>
<tr><th colspan="8">Proposed Well/Structure Location</th></tr>
<tr><td colspan="3">Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 YY</td><td colspan="2">Previously reviewed under an approved EP or DOCD?</td><td>X Yes</td><td></td><td>No
N-10245</td></tr>
<tr><td colspan="2">Is this an existing well or structure?</td><td>Yes</td><td>No X</td><td colspan="2">If this is an existing well or structure, list the Complex ID or API No.</td><td colspan="2"></td></tr>
<tr><td colspan="5">Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?</td><td>X Yes</td><td></td><td>No</td></tr>
<tr><td>WCD info</td><td colspan="2">For wells, volume of uncontrolled blowout (Bbls/day): N/A</td><td colspan="2">For structures, volume of all storage and pipelines (Bbls): N/A</td><td colspan="2">API Gravity of fluid</td><td>26.8</td></tr>
<tr><td></td><td colspan="2">Surface Location</td><td colspan="2">Bottom-Hole Location (For Wells)</td><td colspan="3">Completion (For multiple completions, enter separate lines)</td></tr>
<tr><td>Lease No.</td><td colspan="2">OCS G22987</td><td colspan="2">OCS</td><td colspan="3">OCS
OCS</td></tr>
<tr><td>Area Name</td><td colspan="2">Green Canyon</td><td colspan="2"></td><td colspan="3"></td></tr>
<tr><td>Block No.</td><td colspan="2">680</td><td colspan="2"></td><td colspan="3"></td></tr>
<tr><td rowspan="2">Blockline Departures (in feet)</td><td colspan="2">N/S Departure: F S L
2,750'</td><td colspan="2">N/S Departure: F____L</td><td colspan="3">N/S Departure: F____L
N/S Departure: F____L
N/S Departure: F____L</td></tr>
<tr><td colspan="2">E/W Departure: F W L
3,000'</td><td colspan="2">E/W Departure: F____L</td><td colspan="3">E/W Departure: F____L
E/W Departure: F____L
E/W Departure: F____L</td></tr>
<tr><td rowspan="2">Lambert X-Y coordinates</td><td colspan="2">X:
2,299,800</td><td colspan="2">X:</td><td colspan="3">X:
X:
X:</td></tr>
<tr><td colspan="2">Y:
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Y:
Y:</td></tr>
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Latitude
Latitude</td></tr>
<tr><td colspan="2">Longitude
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Longitude
Longitude</td></tr>
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5,019</td><td>MD (Feet):</td><td>TVD (Feet):</td><td colspan="2" rowspan="2">MD (Feet):
MD (Feet):
MD (Feet):</td><td rowspan="2">TVD (Feet):
TVD (Feet):
TVD (Feet):</td></tr>
<tr><td colspan="3">Anchor Radius (if applicable) in feet:</td><td colspan="2">N/A-DP Drillship or DP Semi</td></tr>
</table>

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location					
Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 YYY	Previously reviewed under an approved EP or DOCD?	X	Yes		No N-10245
Is this an existing well or structure?		Yes	No X	If this is an existing well or structure, list the Complex ID or API No.	
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?		X	Yes		No
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A	For structures, volume of all storage and pipelines (Bbls): N/A	API Gravity of fluid	26.8	

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G22987	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	680		
Blockline Departures (in feet)	N/S Departure: F_S_L 2,700'	N/S Departure: F____L	N/S Departure: F____L N/S Departure: F____L N/S Departure: F____L
	E/W Departure: F_W_L 3,000'	E/W Departure: F____L	E/W Departure: F____L E/W Departure: F____L E/W Departure: F____L
Lambert X-Y coordinates	X: 2,299,800	X:	X: X: X:
	Y: 9,902,700	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.274914	Latitude	Latitude Latitude Latitude
	Longitude -90.969622	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 5,019	MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A-DP Drillship or DP Semi			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 Z	Previously reviewed under an approved EP or DOCD?	X	Yes		No N-10245

Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.	

Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?	X	Yes		No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A	For structures, volume of all storage and pipelines (Bbls): N/A	API Gravity of fluid	26.8

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G22987	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	680		
Blockline Departures (in feet)	N/S Departure: F_S_L 2,650'	N/S Departure: F____L	N/S Departure: F____L N/S Departure: F____L N/S Departure: F____L
	E/W Departure: F_W_L 3,500'	E/W Departure: F____L	E/W Departure: F____L E/W Departure: F____L E/W Departure: F____L
Lambert X-Y coordinates	X: 2,300,300	X:	X: X: X:
	Y: 9,902,650	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.274755	Latitude	Latitude Latitude Latitude
	Longitude -90.968086	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 5,024	MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A-DP Drillship or DP Semi			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	**Area**	**Block**	**X Coordinate**	**Y Coordinate**	**Length of Anchor Chain on Seafloor**
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 ZZ		Previously reviewed under an approved EP or DOCD?	X	Yes		No N-10245
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.	
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?			X	Yes		No

WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A	For structures, volume of all storage and pipelines (Bbls): N/A	API Gravity of fluid	26.8

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G22987	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	680		
Blockline Departures (in feet)	N/S Departure: F_S_L 2,600'	N/S Departure: F____L	N/S Departure: F____L N/S Departure: F____L N/S Departure: F____L
	E/W Departure: F_W_L 3,500'	E/W Departure: F____L	E/W Departure: F____L E/W Departure: F____L E/W Departure: F____L
Lambert X-Y coordinates	X: 2,300,300	X:	X: X: X:
	Y: 9,902,600	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.274617	Latitude	Latitude Latitude Latitude
	Longitude -90.968089	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 5,024	MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A-DP Drillship or DP Semi			

Anchor Locations for Drilling Rig or Construction Barge (If anchor radius supplied above, not necessary)

Anchor Name or No.	Area	Block	X Coordinate	Y Coordinate	Length of Anchor Chain on Seafloor
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	
			X =	Y =	

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

Proposed Well/Structure Location

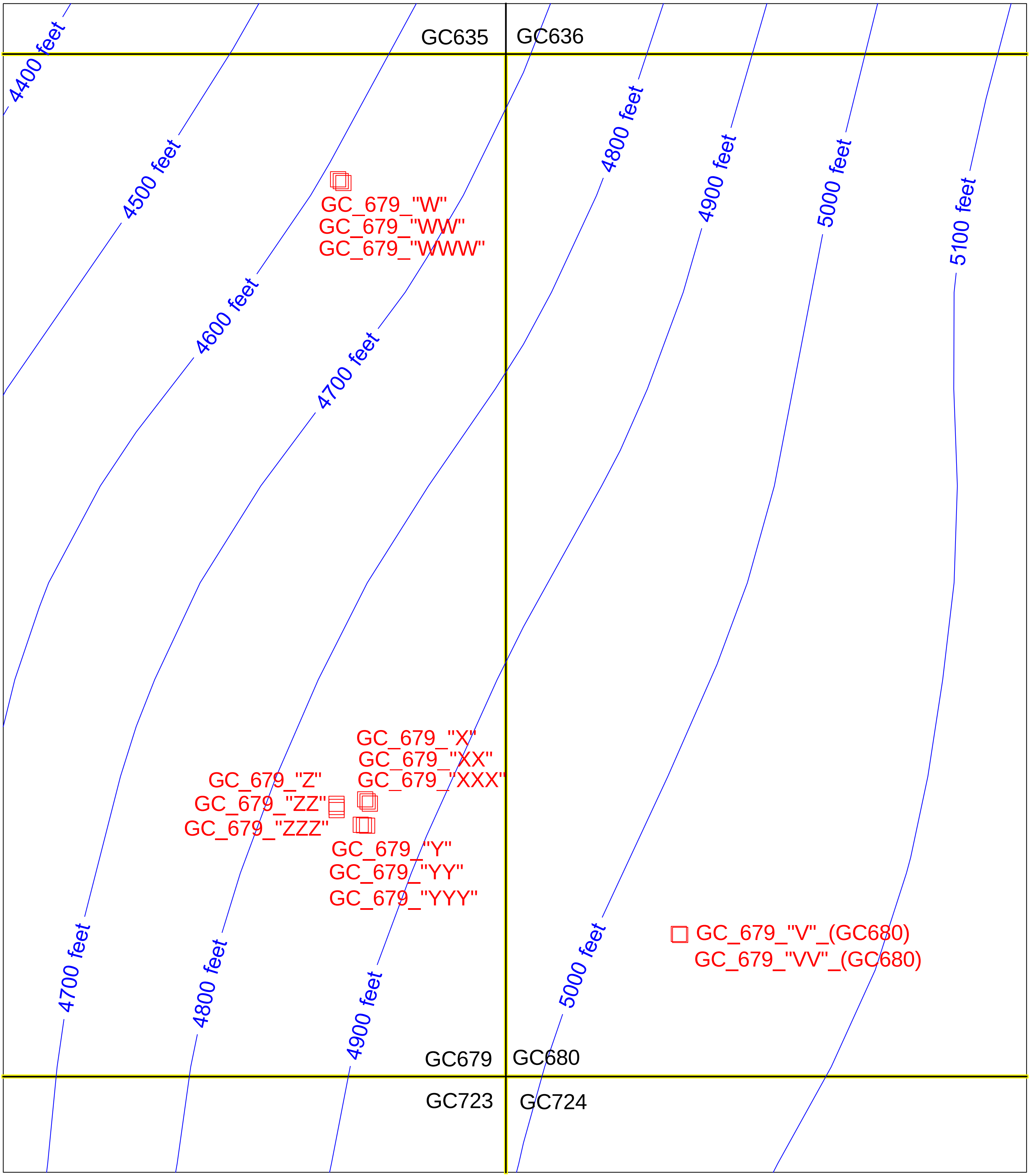
Well or Structure Name/Number (If renaming well or structure, reference previous name): GC 680 ZZZ		Previously reviewed under an approved EP or DOCD?	X	Yes		No N-10245
Is this an existing well or structure?		Yes		No X	If this is an existing well or structure, list the Complex ID or API No.	
Do you plan to use a subsea BOP or a surface BOP on a floating facility to conduct your proposed activities?			X	Yes		No
WCD info	For wells, volume of uncontrolled blowout (Bbls/day): N/A	For structures, volume of all storage and pipelines (Bbls): N/A		API Gravity of fluid	26.8	

	Surface Location	**Bottom-Hole Location (For Wells)**	**Completion (For multiple completions, enter separate lines)**
Lease No.	OCS G22987	OCS	OCS OCS
Area Name	Green Canyon		
Block No.	680		
Blockline Departures (in feet)	N/S Departure: F S L 2,550'	N/S Departure: F____ L	N/S Departure: F____ L N/S Departure: F____ L N/S Departure: F____ L
	E/W Departure: F W L 3,500'	E/W Departure: F____ L	E/W Departure: F____ L E/W Departure: F____ L E/W Departure: F____ L
Lambert X-Y coordinates	X: 2,300,300	X:	X: X: X:
	Y: 9,902,550	Y:	Y: Y: Y:
Latitude/ Longitude	Latitude 27.274480	Latitude	Latitude Latitude Latitude
	Longitude -90.968091	Longitude	Longitude Longitude Longitude

Water Depth (Feet): 5,024	MD (Feet):	TVD (Feet):	MD (Feet): MD (Feet): MD (Feet):	TVD (Feet): TVD (Feet): TVD (Feet):
Anchor Radius (if applicable) in feet:	N/A-DP Drillship or DP Semi			

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 =	



See attached Exhibit 'A' for Public Location Information

N

1:24000

0 2000

US Feet

NAD27 / BLM 15N (ftUS) (EPSG 32065)
Transverse Mercator
Clarke 1866 spheroid
Natural origin: [93 00 00W, 0 00 00N]

Anadarko Petroleum Corporation

GC679-OCS G21811

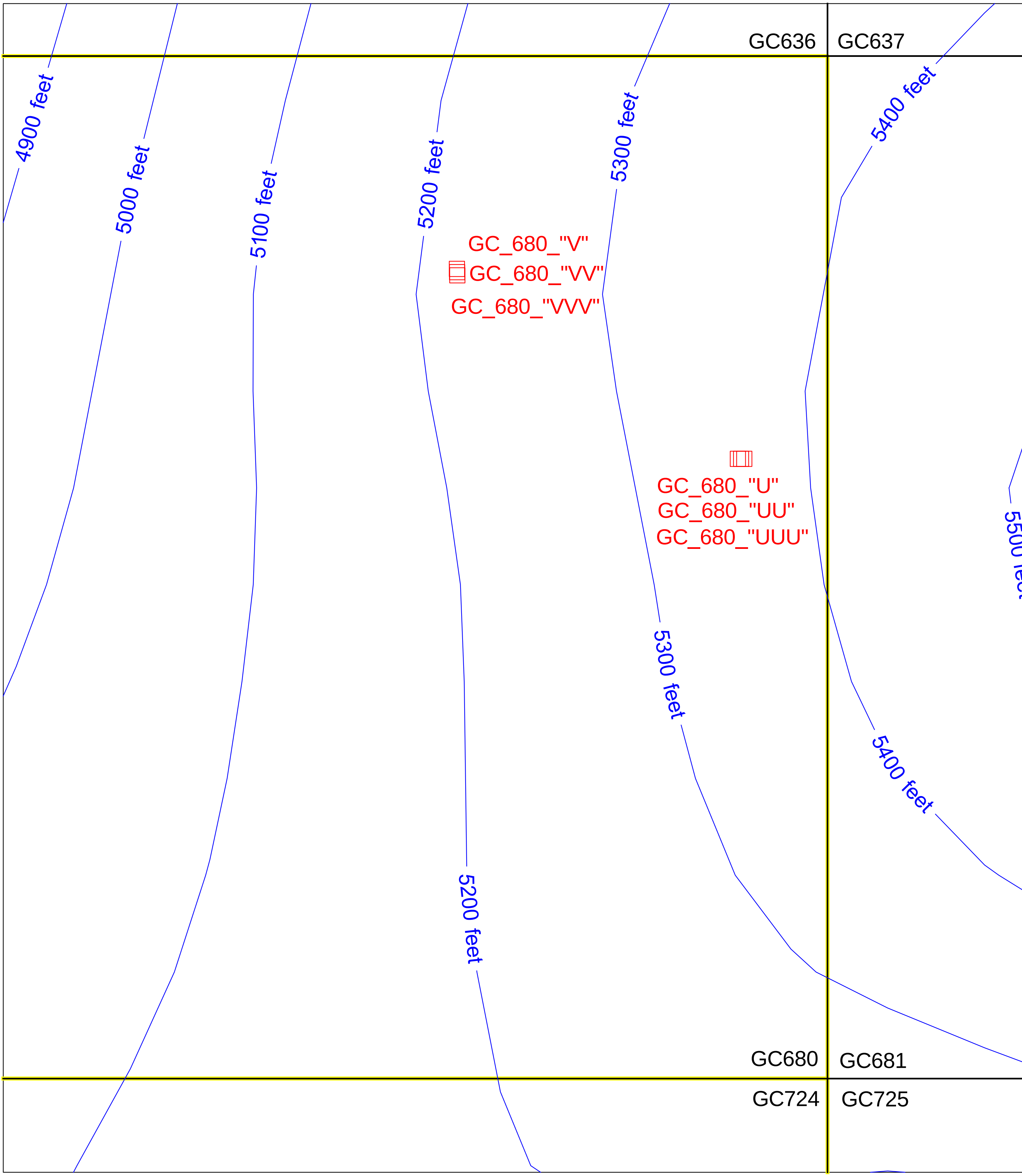
Public Location and Bathymetry Map

Author : TB/DH

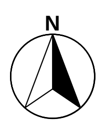
Date : February 26, 2026 | Scale : 1:24000

Exhibit 'A'
GC679
Public Bathymetry Map

Well Name	Location	Corner Calls		X (Feet)	Y (Feet)	Latitude	Longitude	WD
GC_679_"W"	SL	1,940 FNL	2,600 FEL	2294200	9913900	27.305966	-90.986302	4,652
GC_679_"WW"	SL	1,969 FNL	2,559 FEL	2294241	9913871	27.305884	-90.986177	4,652
GC_679_"WWW"	SL	1,998 FNL	2,518 FEL	2294282	9913842	27.305803	-90.986052	4,652
GC_679_"X"	SL	4,294 FSL	2,180 FEL	2294620	9904294	27.279529	-90.985486	4,848
GC_679_"XX"	SL	4,261 FSL	2,144 FEL	2294656	9904261	27.279436	-90.985376	4,848
GC_679_"XXX"	SL	4,228 FSL	2,108 FEL	2294692	9904228	27.279344	-90.985267	4,848
GC_679_"Y"	SL	3,900 FSL	2,250 FEL	2294550	9903900	27.278448	-90.985721	4,852
GC_679_"YY"	SL	3,893 FSL	2,200 FEL	2294600	9903893	27.278427	-90.985567	4,852
GC_679_"YYY"	SL	3,886 FSL	2,150 FEL	2294650	9903886	27.278405	-90.985414	4,852
GC_679_"Z"	SL	4225 FSL	2,625 FEL	2294175	9904225	27.279359	-90.986859	4,834
GC_679_"ZZ"	SL	4,176 FSL	2,624 FEL	2294176	9904176	27.279224	-90.986858	4,834
GC_679_"ZZZ"	SL	4,127 FSL	2,623 FEL	2294177	9904127	27.279089	-90.986857	4,834
GC_679_"V"_(GC680)	SL	2,208 FSL	2,679 FWL	2299479	9902208	27.273576	-90.970635	5,015
GC_679_"VV"_(GC680)	SL	2,194 FSL	2,699 FWL	2299499	9902194	27.273535	-90.970573	5,015



See attached Exhibit 'C' for Public Location Information



1:24000

0 2000

US Feet

NAD27 / BLM 15N (ftUS) (EPSG 32065)
Transverse Mercator
Clarke 1866 spheroid
Natural origin: [93 00 00W, 0 00 00N]

Anadarko Petroleum Corporation

GC680-OCS G22987

Public Location and Bathymetry Map

Author : TB/DH	
Date : February 26, 2026	Scale : 1:24000

Exhibit 'C'
GC680
Public Bathymetry Map

Well Name	Location	Corner Calls		X (Feet)	Y (Feet)	Latitude	Longitude	WD
GC_680_"U"	SL	6,240 FNL	1,390 FEL	2311250	9909600	27.293374	-90.934033	5,405
GC_680_"UU"	SL	6,240 FNL	1,340 FEL	2311300	9909600	27.293372	-90.933879	5,405
GC_680_"UUU"	SL	6,240 FNL	1,290 FEL	2311350	9909600	27.293370	-90.933725	5,405
GC_680_"V"	SL	3,297 FNL	5,742 FEL	2306898	9912543	27.301665	-90.947280	5,223
GC_680_"VV"	SL	3,347 FNL	5,739 FEL	2306901	9912493	27.301528	-90.947273	5,223
GC_680_"VVV"	SL	3,397 FNL	5,736 FEL	2306904	9912443	27.301390	-90.947266	5,223

SECTION B
GENERAL INFORMATION

(a) Applications and Permits

Prior to beginning exploration operations, the following application(s) will be submitted for approval:

Application/Permit	Issuing Agency	Status
Permits to Drill	BSEE Bureau of Safety and Environmental Enforcement (BSEE)	To be submitted

(b) Drilling Fluids

Type of Drilling Fluid	Estimated Volume Per Well
Water-based (NaCl saturated, seawater, freshwater, barite) for Pump and Dump	43,000 bbls per well*
Synthetic-based (internal olefin, ester)	28,500 bbls per well**
Oil-based	N/A

*****_The actual volume of water-based ordered out will be an estimated 27,000 bbls/well of mud. Once on location this volume will be cut back and mixed with seawater to different desired mud weights which will increase the volume that is discharged at the seafloor. The estimated volume that will be discharged at the seafloor will be approximately 43,000 bbls/well (Note: There will be 20 potential wells drilled, for a total of 860,000 bbls.)_

** These will be in 10,000 bbl loadouts for the first two hole sections, with 8,500 for the final hole section. Each hole section will return ~10,000 bbls at the conclusion.

(c) New or Unusual Technology

Anadarko does not propose to use any new or unusual technology to drill the well proposed in this plan.

(d) Bonding Statement

The bond requirements for the activities and facilities proposed in this Supplemental EP are satisfied by an area-wide bond furnished and maintained according to 30 CFR part 256, subpart I; NTL No. 2015-N04, "General Financial Assurance," and National NTL No. 2016-N01 "Requiring Additional Security".

(e) Oil Spill Financial Responsibility (OSFR)

Anadarko Petroleum Corporation (Company Number 00981) has demonstrated oil spill financial responsibility for the facilities proposed in this Supplemental EP according to 30 CFR Part 253, and NTL No. 2008-N05, "Guidelines for Oil Spill Financial Responsibility for Covered Facilities".

(f) Deepwater Well Control Statement

Anadarko Petroleum Corporation (Company Number 00981) has the financial capability to drill a relief well and conduct other emergency well control operations if required.

(g) Blowout Scenario

Anadarko prepared this blowout scenario pursuant to guidance provided in NTL No. 2015-N01.

Purpose

This information provides a generic blowout scenario, additional information regarding any potential oil spill, the measures Anadarko will take to prevent a blowout, and if necessary, promptly respond to manage a blowout scenario if one occurs. The following information is pursuant with 30 CFR 550.213(g), 550.219, 550.250 and NTL No. 2015-N01.

Background

Anadarko prepared this blowout scenario pursuant to guidance provided in NTL No. 2015-N01. The Green Canyon 680 “Y” location, from previously approved Initial Exploration Plan Control No. N-10245, is addressed in this blowout scenario since it is the location with the overall highest potential worst-case discharge (WCD) for the plan area. In addition, WCD data has been included in Section H to address Green Canyon 679 since it has not previously been submitted. A similar approach would be taken in the event of a blowout from the other wells proposed in Green Canyon 679 and 680. Based on NTL No. 2015-N01 guidance, the maximum hydrocarbon discharge from the objective sands was calculated to be 321,368 bopd.

Information Requirements:

The objectives are drilled utilizing a MODU rig with a marine riser and subsea BOP. A typical subsea wellhead system, conductor, surface and intermediate casing program will be used. A hydrocarbon influx occurs, followed by a well control event from the objective sands. The subsea BOP and marine riser fails and a blowout at the seabed occurs. Exposed sands in the primary objective are the WCD scenario.

Estimated Flow Rate of the Potential Blowout

Category	Supplemental EP
Type of Activity	Drilling
Facility Location (area/block/location)	GC 680 Y
Facility Designation	MODU
Distance to Nearest Shoreline (miles)	119 Miles
Uncontrolled Blowout (volume per day)	321,368 bopd
Type of Fluid(s)	Crude Oil

a) Potential for the well to bridge over:

Formation collapse and bridging is expected in a blowout scenario, sanding would occur. Mechanical collapse of the reservoirs in the open-hole section of the wellbore was not considered in determining WCD. During a worst-case discharge event, the open hole portion of the well will be exposed to a substantial underbalance condition. Due to the unconsolidated nature of the formations contributing flow and the relatively weak remaining exposed sediments, a significant quantity sand and heaving shale will enter the flowstream. The presence of sediments in the flowstream are excluded from Anadarko's discharge calculations and assumes no bridging will occur, however, bridging is likely to occur.

b) Likelihood and measures taken for surface and/or subsea intervention to stop the blowout:

The likelihood of surface intervention to stop a blowout is high. In addition to the surface intervention equipment the contracted MODU will have the equipment/ability to perform the following:

<u>ROV Secondary BOP Control System</u>: The BOP is confirmed to have a ROV Intervention Panel and circuits that have the following attributes:

- ROV Intervention is capable of Opening and Closing each Shear Ram, Ram Locks, One Pipe Ram and Disconnect the LMRP, all under MASP conditions.
- ROV Intervention is to be tested during the initial stump test and during the initial BOP latch up.
- BOP panels also can be operated by an ROV from an independent supply boat in the event of a loss-of-rig scenario.

<u>Deadman/Autoshear Function</u>: The rig is equipped with an automated sequence that closes the blind shear rams in the event of any of the following scenarios:

- Inadvertent disconnect of the LMRP
- Loss of both hydraulic pressure and electrical supply from the surface BOP control system
- No human interface is required once these systems are armed.

c) Availability of a rig to drill a relief well:

Per the preliminary Mutual Aid agreements that are being worked between E&P Operators in the Gulf of Mexico, Anadarko will select from the best rig option available in the Gulf of Mexico fleet if and when it is required for relief well work. A rig that could be used to drill a relief well is the *Valaris DS-18* drillship, which is a drillship capable of drilling in 12,000' of water without any constraints. The rig is anticipated to be under contract with Anadarko starting in late 2026/early 2027.

There are no nearby platforms from which to drill a relief well. It is not feasible to drill a relief well from land.

d) Rig constraints:

The minimum capability for a drilling rig is the ability to drill in 6,000' of water, to a depth of greater than 30,000' TVD (up to 40,000’ TVD), and a 15k BOP Stack to drill a relief well. The *Valaris DS-18* drillship meets these requirements.

e) Time taken to mobilize a rig and drill a relief well:

An estimate of 7-21 days is required to suspend operations on a deepwater GOM well and begin drilling the relief well. This assumes 0-14 days to suspend current operations on an existing well and 7 days to mobilize and be ready to spud the relief well. The estimated time to drill the relief well to a blowout originating from the target zone is 60-70 days, for a total estimated time of 67-91 days from time of blowout to finishing the relief well.

f) Assumptions and calculations used in the Supplemental EP:

- The maximum total volume during a blowout could potentially be **29,244,488 bbls** assuming 91-days (max days) for the maximum duration of a blowout, multiplied by the worst case daily uncontrolled blowout volume of **321,368 bopd.**

g) Measures taken to enhance ability to prevent a blowout:

- **Well Design**: Anadarko utilizes a systematic well design process for the planning and construction of a well operation. This process taps into the vast depth of experience Anadarko possesses in the deep-water drilling arena and involves a multi-team peer review of the well design, shallow hazards, and formation pressure hazards expected during drilling. This process minimizes the potential for an unplanned well-control event that could lead to a blowout. This process will also include a Registered Professional Engineer review and approval of the final casing design and cementing program.

A detailed pre-drill assessment of formation pressure provided by Anadarko’s Geological and Geophysical team, along with third-party consultants, allows for a mud program that provides an overbalanced mud weight for the safe drilling of the well. For an exploration well, this may also include taking formation pressures to confirm the actual formation pressure during the well construction process to minimize the risk of an unplanned well control event. The pore pressure environment is understood due to the nearby offset wells.

The well construction process also requires systematic review and management acceptance of the start-up preparation work for the rig and crews and the third-party technical audit work on the rig and the rig's well control equipment. This measures the rig's ability to handle an unplanned well control event and provides assurance that the rig can successfully mitigate a loss of well control event and prevent it from becoming a blowout scenario.

- **Barrier Philosophy**: For all well designs, Anadarko requires and uses a redundant barrier philosophy–that being two independent tested barriers including one mechanical barrier, across each flow path during well operations.

For the final casing string (or liner if it is the final string), there shall be two mechanical barriers in addition to cement inside the wellbore.

It is also standard practice to conduct pressure testing, in accordance with the law, to confirm integrity on all relevant barriers.

In addition, all intermediate and production casings returned to the wellhead will be locked down before subsequent wellbore construction is proceeded.

- **BOP and Well Control Equipment**: The rig will have an 18-3/4" 15k psi BOP with primary and secondary BOP control systems. The BOP will have been completely recertified compliant to OEM specifications by a qualified third-party. Prior to commencement of operations, independent third-party verification will be obtained that the sub-sea BOP is designed for the specific equipment on the rig and this specific well design. 250.731(c) and (d).
- **BOP and Well Control Equipment Testing**: To ensure effectiveness of the BOP and well control equipment, a testing program will be conducted prior to running the BOP and then during the well operations. This testing program will provide compliance with current federal regulations for pressure and function testing and will also provide periodic assurance on the performance of both primary and secondary BOP control systems including actual interface operations with the ROV and the ROV panel.
- **Well Control Training and Drills**: Anadarko requires that key nominated onshore and offshore positions, including rig contractor personnel, hold a WellCAP or equivalent well control training certificate, renewable every two years for the type of floating drilling operation being conducted. Anadarko also monitors compliance for its personnel with the federal regulations and Subpart O for well control training.

A comprehensive program of well control drills will be conducted offshore to ensure readiness to identify and then manage a well control situation and thereby minimize the potential for a well control event to lead to a blowout scenario.

h) Arrangements for drilling a relief well:

- Anadarko maintains a master agreement with Wild Well Control, Inc. for advice, management, engineering, well kick pre- and post-modeling, and resource support for an unplanned loss-of-well-control event. If any well control event occurs, Wild Well Control, Inc. would be contacted and mobilized if required to support Anadarko's operational team, both in the onshore and offshore locations.
- The conceptual relief well design is similar to the design of the GC 680 Y well, in that casing weights, grades, and setting points would be very similar. Site clearance letters for surface locations will be completed and deemed acceptable for drilling prior to any drilling operations. Depending on the nature of the blowout scenario, well geometry, and total depth required to intersect the blowout, previously submitted surface locations and/or additional surface locations would be submitted and all reviewed for best suitability for the location of the relief well if needed. The conceptual well design is not anticipated to take over two days to finalize upon initialization.
- Anadarko's philosophy is to carry adequate inventory in stock to drill a complete well(s) from surface to TD. Back-up long-lead equipment equivalent to the original well design will be carried in stock to allow a rapid response. This includes a spare deepwater sub-sea wellhead system and the large OD casing (36", 28", 22", 18", 16" and 14") and connectors required. Smaller OD casing (11-7/8" and 9-7/8") are considered widely available on the ground in the GOM and would be resourced out of existing inventory or from suppliers as required.
- Existing service agreements will be in place for support services, including drilling fluids, casing running, cementing, ROVs, solids control, mud logging, directional drilling, LWD/MWD, logging, boats, and helicopters.
- Specialist services for range finding to drill the relief well in close proximity to the original wellbore at the reservoir depth will be provided through Vector Magnetics LLC. Sperry Drilling/Halliburton and Baker Hughes have in-house personnel to supplement Vector Magnetics LLC under our existing directional drilling agreements.

SECTION C
GEOLOGICAL AND GEOPHYSICAL INFORMATION

(a) Geological Description

Discussions regarding geologic information are considered proprietary and have been omitted from this public copy of the Initial EP.

(b) Structure Contour Maps

Current structure maps drawn to the top of each productive hydrocarbon sand showing the entire lease block, the surface locations of each well and locations of geological cross-sections, are enclosed as **Attachment C-1. (Omitted, proprietary)**

(c) Interpreted 2-D and/or 3-D Seismic Lines

Interpreted seismic lines are enclosed as **Attachment C-2. (Omitted, proprietary)**

(d) Geological Structure Cross-Sections

Interpreted geological structure cross-sections showing the location and depth of each proposed well are enclosed as **Attachment C-3. (Omitted, proprietary)**

(e) Shallow Hazards Report

Shallow Hazards with AUV data covering GC 679, 680 were submitted with the Initial EP (Plan Control No. N-10245).

Ocean Geo Solutions
Integrated 3D Geohazard Assessment, Project Number: H100142

Oceaneering
Archaeological and Geohazard Assessment Report
Blocks 679, 680, 723, & 724
Green Canyon Area, Gulf of Mexico
Oceaneering Document Number: 227954-OII-RPT-ABH-01-R0
Project Date Range: Oct. 29- Nov. 12, 2023

APPENDIX A – PUBLIC SHALLOW HAZARDS STATEMENTS

Public Shallow Hazards Statement – Proposed GC679-W Well Location

March 4, 2026

US Department of the Interior
Bureau of Ocean Energy Management
1201 Elmwood Park Blvd.
New Orleans, LA 70213-2394

Reference: Shallow Hazards Analysis
Green Canyon Block 679
(OCS-G-21811)

Ladies/Gentlemen:

Anadarko Petroleum Company contracted Xodus Group Inc. to prepare a Well Clearance Letter for the Proposed W well location in Block 679, Green Canyon Area (OCS-G-21811). This letter addresses seabed and shallow geologic conditions that may impact exploratory drilling operations within 2,000ft of the proposed well site. The depth limit of this site clearance assessment is -10,600ft below sea surface (5,948ft BML).

Seabed Hazards. The seabed at the proposed well is smooth with a gradient of 3.97° ESE. Within 2,000ft of the proposed well, two areas of debris flow are present. Adjacent to the debris flow areas, two slope failure evacuation escarpments with seafloor displacement are present. The debris flow areas and escarpments are not interpreted to directly affect drilling operations,

The seabed within a 2,000ft radius of the proposed well shows numerous NNW to SSE trending seabed fault scarps. The fault scarps are not expected to affect drilling operations. Soft clays are interpreted.

No seabed infrastructure occurs within a 2,000ft radius. One sonar target is located within the 2,000ft radius from the proposed well. Sonar target 2 is located approximately 1,221ft NNW from the proposed well. The contact is interpreted as modern debris.

There are no indications of seabed hydrocarbon fluid seeps within 2,000ft of the proposed well location.

Sub-Seabed Hazards.

A **Slight Shallow Water Flow Risk** is assigned to sand-rich intervals within Units C and D.

Proposed GC679-W Location (Surface)							
Location Coordinates							
NAD 27 Datum - Clarke 1866 Ellipsoid					**UTM Zone 15 - CM 87° West**		
Latitude	27°	18’	21.4774”	North	Easting	2,294,200	US ft E
Longitude	90°	59’	10.6858”	West	Northing	9,913,900	US ft N
Latitude Decimal			27.305966				
Longitude Decimal			-90.986301				
FEL Green Canyon 679			2,600ft	US ft	Inline	5065	
FNL Green Canyon 679			1,940ft	US ft	Crossline	44493	
Water Depth: -4,652ft			Slope: 3.97° ESE				

Conclusions and Recommendations.

No problems are interpreted at seabed.

A **Slight Shallow Water Flow Risk** occurs within intervals of Units C and D.

Sincerely,

Anadarko Petroleum Corporation

APPENDIX B – Sensitive Sessile Benthic Community Statement

Sensitive Sessile Benthic Communities Statement – Proposed GC679-W Well Location

Anadarko Petroleum Corporation

March 4, 2026

US Department of the Interior
Bureau of Ocean Energy Management
1201 Elmwood Park Blvd.
New Orleans, LA 70213

Reference: Sensitive Sessile Benthic Community Summary
Proposed GC679-W Well Location in Green Canyon GC679 (OCS-G-21811)

Ladies/Gentlemen:

Anadarko Petroleum Corporation contracted Xodus Group Inc. to prepare a Well Clearance Letter for the Proposed W well location in Block 679, Green Canyon Area (OCS-G-21811). This letter addresses location proximity to potential sensitive sessile benthic community sites. This well will be drilled from a dynamically positioned drilling module; therefore, an anchoring assessment is not required.

This sensitive sessile benthic community summary letter is issued as a supplement to the Well Clearance Letter for this proposed well. A Biological, Physical and Socio-economic Plat is included illustrating the areas of potential seabed impact.

Potential Sensitive Sessile Benthic Communities

Features or areas that could support high-density sensitive sessile benthic communities are ***not*** located within 2,000 feet of any proposed mud and cuttings discharge location. No areas that could support benthic communities were identified in the vicinity of the well location.

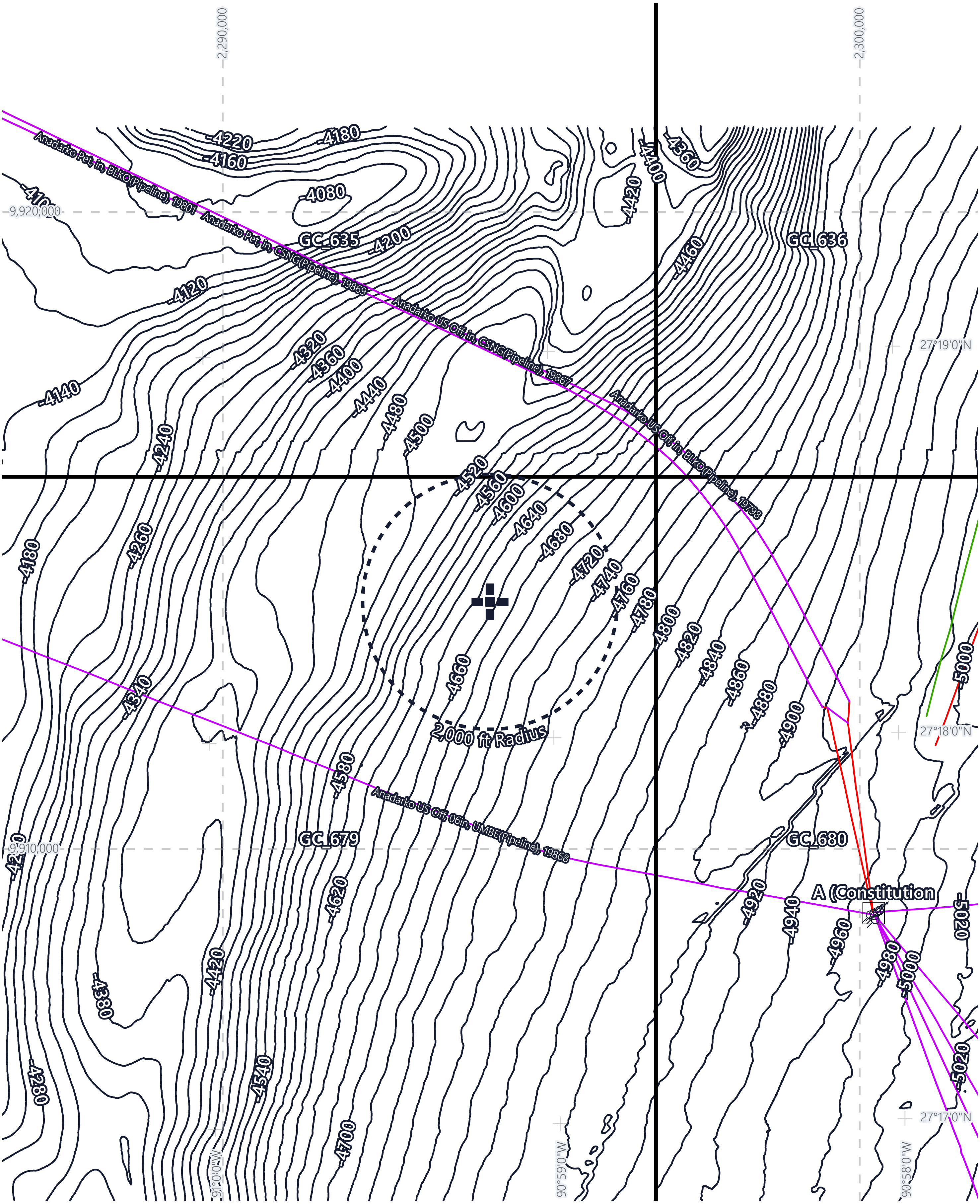
Proposed GC679-W Location (Surface)							
Location Coordinates							
NAD 27 Datum - Clarke 1866 Ellipsoid					**UTM Zone 15 - CM 87° West**		
Latitude	27°	18'	21.4774"	North	Easting	2,294,200	US ft E
Longitude	90°	59'	10.6858"	West	Northing	9,913,900	US ft N
Latitude Decimal			27.305966				
Longitude Decimal			-90.986301				
FEL Green Canyon 679			2,600ft		US ft	Inline	5065
FNL Green Canyon 679			1,940ft		US ft	Crossline	44493
Water Depth: -4,652ft			Slope: 3.97° ESE				

There are no areas with the potential for a Sensitive Sessile Benthic Community within 2,000ft of the proposed location.

Conclusions and Recommendations: The proposed GC679-W well location will not impact any sites favorable for development of sensitive sessile benthic communities.

Sincerely,
Anadarko Petroleum Corporation

Biological, Physical & Socio-Economic Plat



0 500 1,000 2,000 3,000 Feet

Figure Scale 1" : 2,000'

N

Proposed GC679-W Surface Location
(2,294,200ft E / 9,913,900ft N)

-4060 Seabed depth below sea surface, contoured at 20ft intervals

Note: No sensitive seabed biology interpreted in GC679

APPENDIX A – PUBLIC SHALLOW HAZARDS STATEMENTS

Public Shallow Hazards Statement – Proposed GC679-X Well Location

March 23, 2026

US Department of the Interior
Bureau of Ocean Energy Management
1201 Elmwood Park Blvd.
New Orleans, LA 70213-2394

Reference: Shallow Hazards Analysis
Green Canyon Block 679
(OCS-G-21811)

Ladies/Gentlemen:

Anadarko Petroleum Company contracted Xodus Group Inc. to prepare a Well Clearance Letter for the Proposed X well location in Block 679, Green Canyon Area (OCS-G-21811). This letter addresses seabed and shallow geologic conditions that may impact exploratory drilling operations within 2,000ft of the proposed well site. The depth limit of this site clearance assessment is -10,600ft below sea surface (5,752ft BML).

Seabed Hazards. The seabed at the proposed well is smooth with a gradient of 1.64° ESE. Within 2,000ft of the proposed well, two areas of debris flow deposits are present. The debris flow areas are not expected to affect drilling operations.

The seabed within a 2,000ft radius of the proposed well shows numerous NW to SE trending shallow seabed gullies/channels as well as two identified drag scars. The shallow gullies/channels and drag scars are not expected to affect drilling operations. Soft clays are interpreted.

No seabed infrastructure or sonar targets occur within a 2,000ft radius.

There are no indications of seabed hydrocarbon fluid seeps within 2,000ft of the proposed well location.

Sub-Seabed Hazards.

A **Slight Shallow Water Flow Risk** is assigned to sand-rich intervals within Units B and D.

Proposed GC679-X Location (Surface)							
Location Coordinates							
NAD 27 Datum - Clarke 1866 Ellipsoid					**UTM Zone 15 - CM 87° West**		
Latitude	27°	16’	46.3028”	North	Easting	2,294,620	US ft E
Longitude	90°	59’	7.7482”	West	Northing	9,904,294	US ft N
Latitude Decimal				27.27952856			
Longitude Decimal				-90.98548561			
FEL Green Canyon 679				2,180ft	US ft	Inline	5137
FSL Green Canyon 679				4,294ft	US ft	Crossline	44177
Water Depth: -4,848ft			Slope: 1.64° ESE				

Conclusions and Recommendations.

No problems are interpreted at seabed.

A **Slight Shallow Water Flow Risk** occurs within intervals of Units B and D.

Sincerely,

Anadarko Petroleum Corporation

APPENDIX B – Sensitive Sessile Benthic Community Statement

Sensitive Sessile Benthic Communities Statement – Proposed GC679-X Well Location

Anadarko Petroleum Corporation

March 23, 2026

US Department of the Interior
Bureau of Ocean Energy Management
1201 Elmwood Park Blvd.
New Orleans, LA 70213

Reference: Sensitive Sessile Benthic Community Summary
Proposed GC679-X Well Location in Green Canyon GC679 (OCS-G-21811)

Ladies/Gentlemen:

Anadarko Petroleum Corporation contracted Xodus Group Inc. to prepare a Well Clearance Letter for the Proposed X well location in Block 679, Green Canyon Area (OCS-G-21811). This letter addresses location proximity to potential sensitive sessile benthic community sites. This well will be drilled from a dynamically positioned drilling module; therefore, an anchoring assessment is not required.

This sensitive sessile benthic community summary letter is issued as a supplement to the Well Clearance Letter for this proposed well. A Biological, Physical and Socio-economic Plat is included illustrating the areas of potential seabed impact.

Potential Sensitive Sessile Benthic Communities

Features or areas that could support high-density sensitive sessile benthic communities are ***not*** located within 2,000 feet of any proposed mud and cuttings discharge location. No areas that could support benthic communities were identified in the vicinity of the well location.

Proposed GC679-X Location (Surface)								
Location Coordinates								
NAD 27 Datum - Clarke 1866 Ellipsoid					**UTM Zone 15 - CM 87° West**			
Latitude	27°	16’	46.3028”	North	Easting	2,294,620	US ft E	
Longitude	90°	59’	7.7482”	West	Northing	9,904,294	US ft N	
Latitude Decimal				27.27952856				
Longitude Decimal				-90.98548561				
FEL Green Canyon 679				2,180ft	US ft	Inline	5137	
FSL Green Canyon 679				4,294ft	US ft	Crossline	44177	
Water Depth: -4,848ft				Slope: 1.64° ESE				

There are no areas with the potential for a Sensitive Sessile Benthic Community within 2,000ft of the proposed location.

Conclusions and Recommendations: The proposed GC679-X well location will not impact any sites favorable for development of sensitive sessile benthic communities.

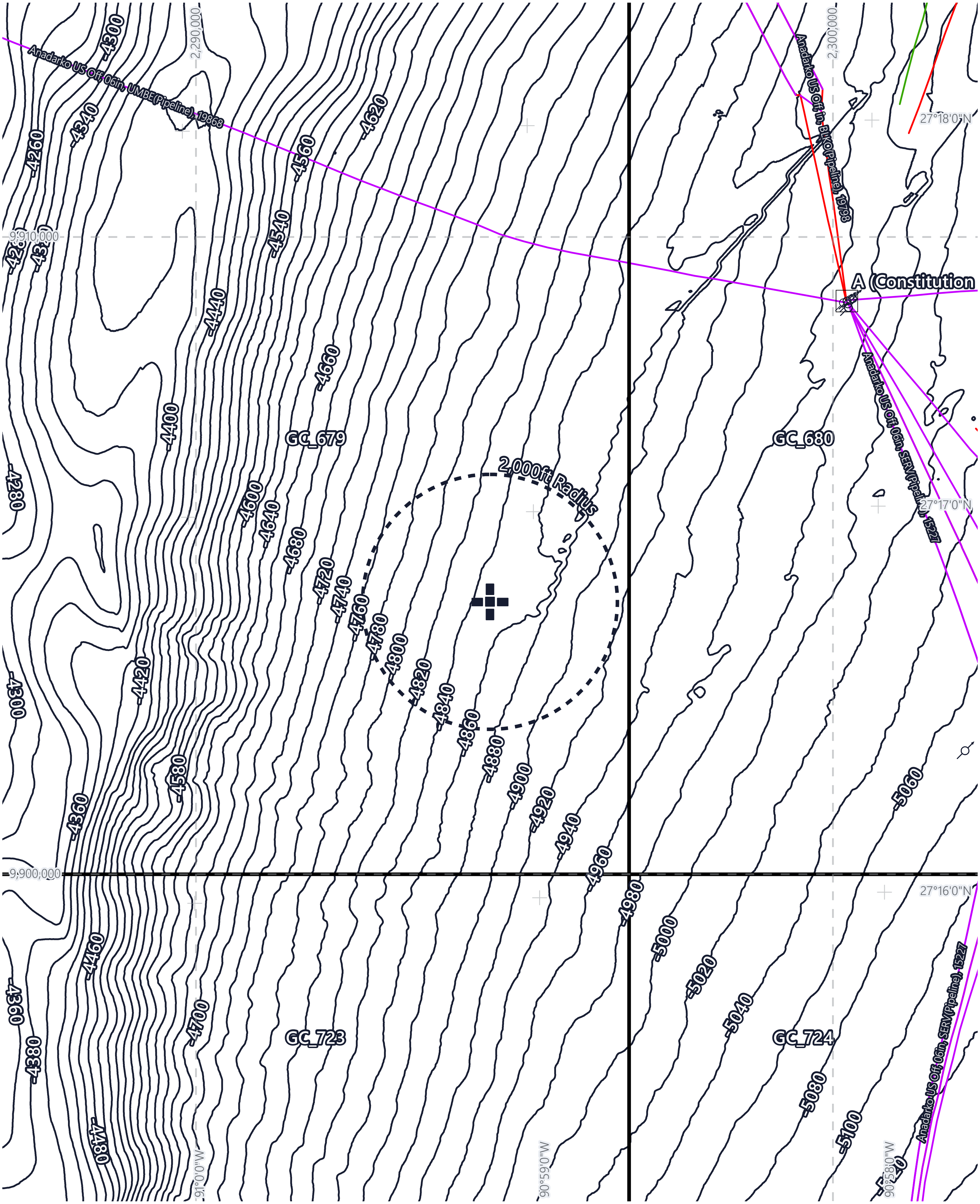
Sincerely,
Anadarko Petroleum Corporation

Biological, Physical & Socio-Economic Plat

0 500 1,000 2,000 3,000 Feet

Figure Scale 1" : 2,000'

N



Proposed GC679-X Surface Location
(2,294,620ft E / 9,904,294ft N)

-4840 Seabed depth below sea surface, contoured at 20ft intervals

Note: No sensitive seabed biology interpreted in GC679

APPENDIX A – PUBLIC SHALLOW HAZARDS STATEMENTS

Public Shallow Hazards Statement – Proposed GC679-Y Well Location

March 5, 2026

US Department of the Interior
Bureau of Ocean Energy Management
1201 Elmwood Park Blvd.
New Orleans, LA 70213-2394

Reference: Shallow Hazards Analysis
Green Canyon Block 679
(OCS-G-21811)

Ladies/Gentlemen:

Anadarko Petroleum Company contracted Xodus Group Inc. to prepare a Well Clearance Letter for the Proposed Y well location in Block 679, Green Canyon Area (OCS-G-21811). This letter addresses seabed and shallow geologic conditions that may impact exploratory drilling operations within 2,000ft of the proposed well site. The depth limit of this site clearance assessment is -10,600ft below sea surface (5,748ft BML).

Seabed Hazards. The seabed at the proposed well is smooth with a gradient of 1.64° ESE. Within 2,000ft of the proposed well, two areas of debris flow deposits are present. The debris flow areas are not expected to affect drilling operations.

The seabed within a 2,000ft radius of the proposed well shows numerous NNW to SSE trending seabed fault scarps as well as two identified drag scars. The fault scarps and drag scars are not expected to affect drilling operations. Soft clays are interpreted.

No seabed infrastructure or sonar targets occur within a 2,000ft radius.

There are no indications of seabed hydrocarbon fluid seeps within 2,000ft of the proposed well location.

Sub-Seabed Hazards.

A **Slight Shallow Water Flow Risk** is assigned to sand-rich intervals within Units B and D.

Proposed GC679-Y Location (Surface)							
Location Coordinates							
NAD 27 Datum - Clarke 1866 Ellipsoid					**UTM Zone 15 - CM 87° West**		
Latitude	27°	16’	42.4139”	North	Easting	2,294,550	US ft E
Longitude	90°	59’	8.5942”	West	Northing	9,903,900	US ft N
Latitude Decimal			27.2784493				
Longitude Decimal			-90.9857206				
FEL Green Canyon 679			2,250ft	US ft	Inline	5139	
FSL Green Canyon 679			3,900ft	US ft	Crossline	44161	
Water Depth: -4,852ft			Slope: 1.64° ESE				

Conclusions and Recommendations.

No problems are interpreted at seabed.

A **Slight Shallow Water Flow Risk** occurs within intervals of Units B and D.

Sincerely,

Anadarko Petroleum Corporation

APPENDIX B – Sensitive Sessile Benthic Community Statement

Sensitive Sessile Benthic Communities Statement – Proposed GC679-Y Well Location

Anadarko Petroleum Corporation

March 5, 2026

US Department of the Interior
Bureau of Ocean Energy Management
1201 Elmwood Park Blvd.
New Orleans, LA 70213

Reference: Sensitive Sessile Benthic Community Summary
Proposed GC679-Y Well Location in Green Canyon GC679 (OCS-G-21811)

Ladies/Gentlemen:

Anadarko Petroleum Corporation contracted Xodus Group Inc. to prepare a Well Clearance Letter for the Proposed Y well location in Block 679, Green Canyon Area (OCS-G-21811). This letter addresses location proximity to potential sensitive sessile benthic community sites. This well will be drilled from a dynamically positioned drilling module; therefore, an anchoring assessment is not required.

This sensitive sessile benthic community summary letter is issued as a supplement to the Well Clearance Letter for this proposed well. A Biological, Physical and Socio-economic Plat is included illustrating the areas of potential seabed impact.

Potential Sensitive Sessile Benthic Communities

Features or areas that could support high-density sensitive sessile benthic communities are ***not*** located within 2,000 feet of any proposed mud and cuttings discharge location. No areas that could support benthic communities were identified in the vicinity of the well location.

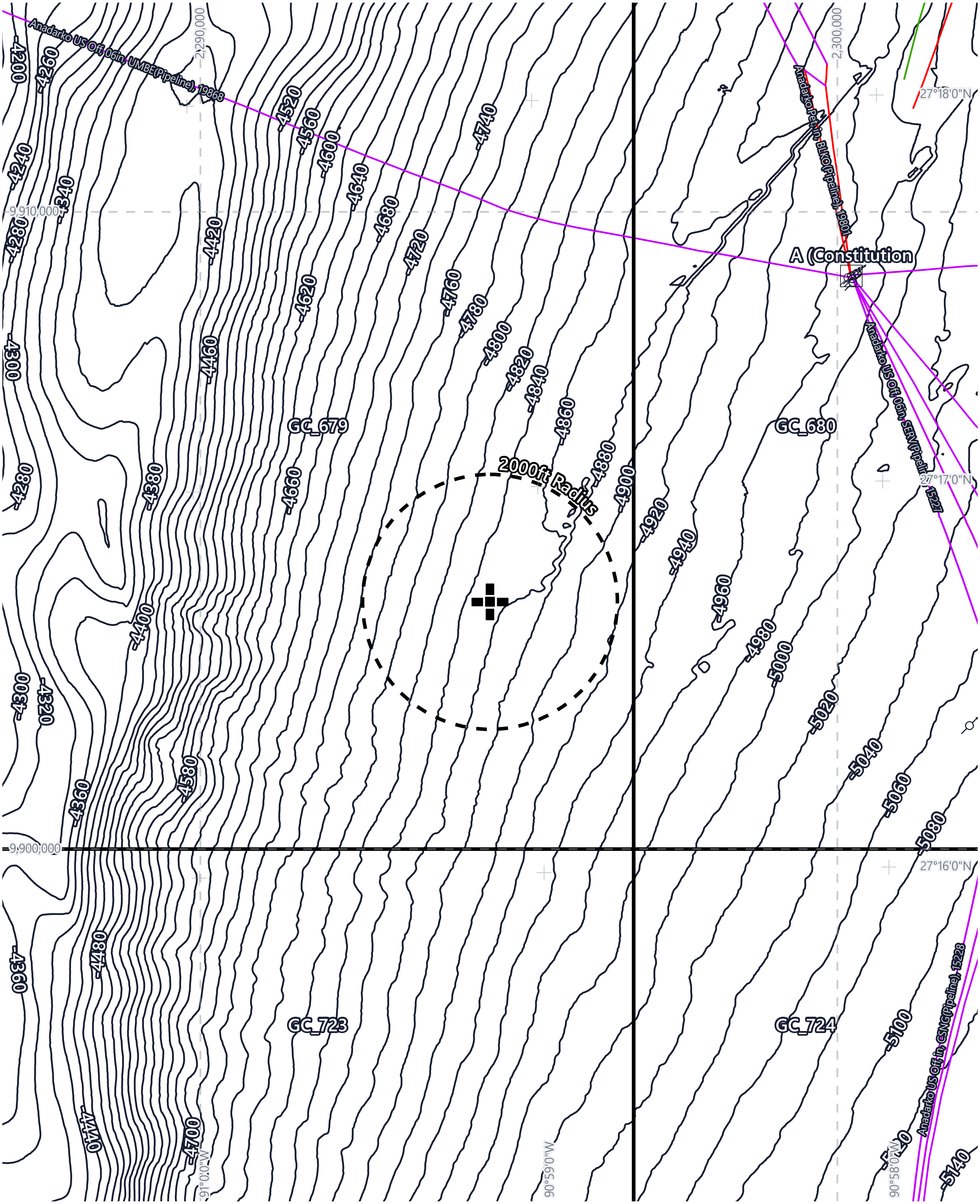
Proposed GC679-Y Location (Surface)							
Location Coordinates							
NAD 27 Datum - Clarke 1866 Ellipsoid					UTM Zone 15 - CM 87° West		
Latitude	27°	16’	42.4139”	North	Easting	2,294,550	US ft E
Longitude	90°	59’	8.5942”	West	Northing	9,903,900	US ft N
Latitude Decimal			27.2784493				
Longitude Decimal			-90.9857206				
FEL Green Canyon 679			2,250ft	US ft	Inline	5139	
FSL Green Canyon 679			3,900ft	US ft	Crossline	44161	
Water Depth: -4,852ft			Slope: 1.64° ESE				

There are no areas with the potential for a Sensitive Sessile Benthic Community within 2,000ft of the proposed location.

Conclusions and Recommendations: The proposed GC679-Y well location will not impact any sites favorable for development of sensitive sessile benthic communities.

Sincerely,
Anadarko Petroleum Corporation

Biological, Physical & Socio-Economic Plat



0 500 1,000 2,000 3,000 Feet

Figure Scale 1" : 2,000'

N

Proposed GC679-Y Surface Location
(2,294,550ft E / 9,903,900ft N)

-4840 Seabed depth below sea surface, contoured at 20ft intervals

Note: No sensitive seabed biology interpreted in GC679

APPENDIX A – PUBLIC SHALLOW HAZARDS STATEMENTS

Public Shallow Hazards Statement – Proposed GC679-Z Well Location

March 9, 2026

US Department of the Interior
Bureau of Ocean Energy Management
1201 Elmwood Park Blvd.
New Orleans, LA 70213-2394

Reference: Shallow Hazards Analysis
Green Canyon Block 679
(OCS-G-21811)

Ladies/Gentlemen:

Anadarko Petroleum Company contracted Xodus Group Inc. to prepare a Well Clearance Letter for the Proposed Z well location in Block 679, Green Canyon Area (OCS-G-21811). This letter addresses seabed and shallow geologic conditions that may impact exploratory drilling operations within 2,000ft of the proposed well site. The depth limit of this site clearance assessment is -10,600ft below sea surface (5,766ft BML).

Seabed Hazards. The seabed at the proposed well is smooth with a gradient of 1.64° ESE. Within 2,000ft of the proposed well, two areas of debris flow deposits are present. The debris flow areas are not expected to affect drilling operations.

The seabed within a 2,000ft radius of the proposed well shows numerous NW to SE trending shallow seabed gullies/channels as well as two identified drag scars. The shallow gullies/channels and drag scars are not expected to affect drilling operations. Soft clays are interpreted.

No seabed infrastructure or sonar targets occur within a 2,000ft radius.

There are no indications of seabed hydrocarbon fluid seeps within 2,000ft of the proposed well location.

Sub-Seabed Hazards.

A **Slight Shallow Water Flow Risk** is assigned to sand-rich intervals within Units B and D.

Proposed GC679-Z Location (Surface)							
Location Coordinates							
NAD 27 Datum - Clarke 1866 Ellipsoid					UTM Zone 15 - CM 87° West		
Latitude	27°	16'	45.6915"	North	Easting	2,294,175	US ft E
Longitude	90°	59'	12.6911"	West	Northing	9,904,225	US ft N
Latitude Decimal			27.27935875				
Longitude Decimal			-90.98685864				
FEL Green Canyon 679			2,625ft	US ft	Inline	5134	
FSL Green Canyon 679			4,225ft	US ft	Crossline	44161	
Water Depth: -4,834ft			Slope: 1.64° ESE				

Conclusions and Recommendations.

No problems are interpreted at seabed.

A **Slight Shallow Water Flow Risk** occurs within intervals of Units B and D.

Sincerely,

Anadarko Petroleum Corporation

APPENDIX B – Sensitive Sessile Benthic Community Statement

XODUS

Sensitive Sessile Benthic Communities Statement – Proposed GC679-Z Well Location

Anadarko Petroleum Corporation

March 9, 2026

US Department of the Interior
Bureau of Ocean Energy Management
1201 Elmwood Park Blvd.
New Orleans, LA 70213

Reference: Sensitive Sessile Benthic Community Summary
Proposed GC679-Z Well Location in Green Canyon GC679 (OCS-G-21811)

Ladies/Gentlemen:
Anadarko Petroleum Corporation contracted Xodus Group Inc. to prepare a Well Clearance Letter for the Proposed Z well location in Block 679, Green Canyon Area (OCS-G-21811). This letter addresses location proximity to potential sensitive sessile benthic community sites. This well will be drilled from a dynamically positioned drilling module; therefore, an anchoring assessment is not required.

This sensitive sessile benthic community summary letter is issued as a supplement to the Well Clearance Letter for this proposed well. A Biological, Physical and Socio-economic Plat is included illustrating the areas of potential seabed impact.

Potential Sensitive Sessile Benthic Communities
Features or areas that could support high-density sensitive sessile benthic communities are ***not*** located within 2,000 feet of any proposed mud and cuttings discharge location. No areas that could support benthic communities were identified in the vicinity of the well location.

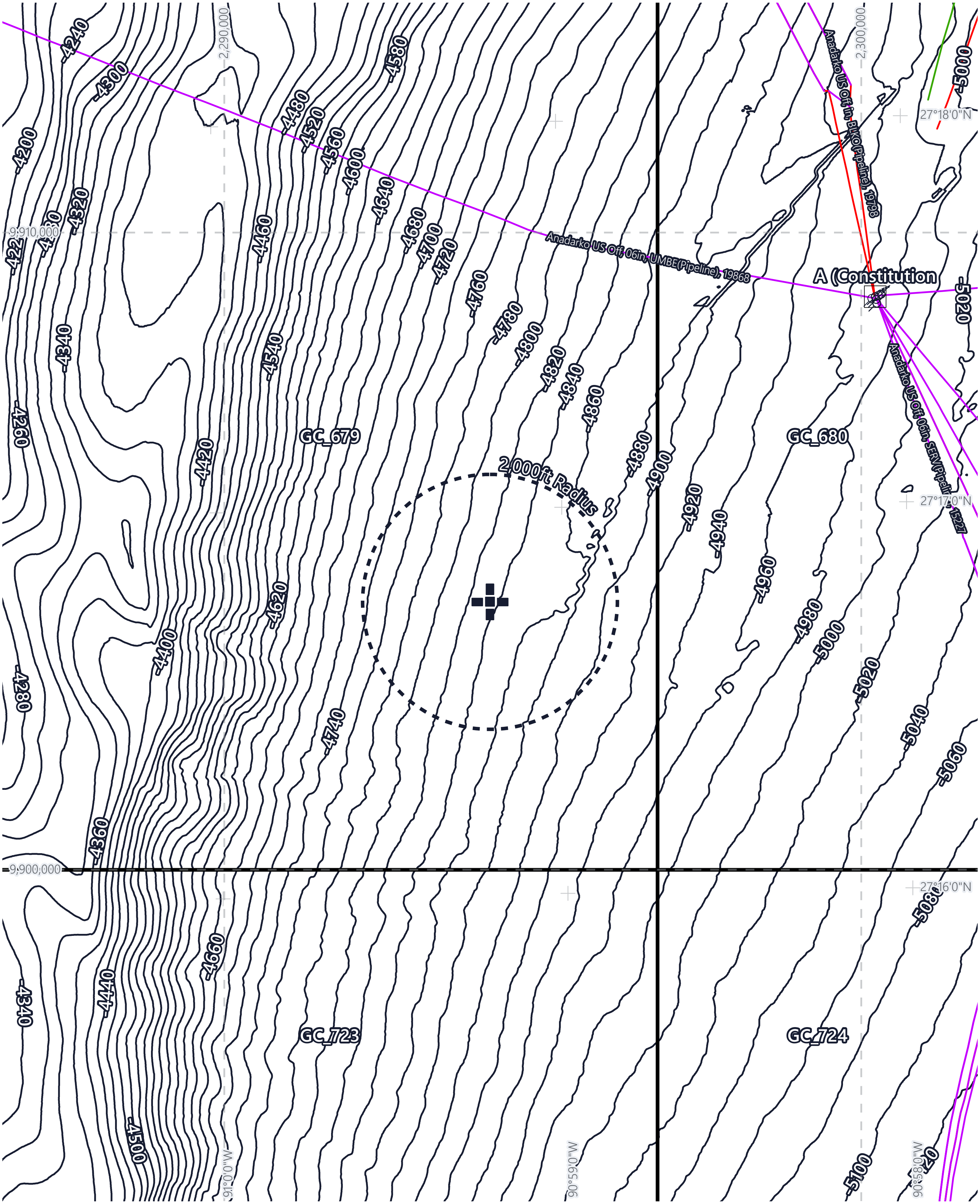
Proposed GC679-Z Location (Surface)							
Location Coordinates							
NAD 27 Datum - Clarke 1866 Ellipsoid					UTM Zone 15 - CM 87° West		
Latitude	27°	16’	45.6915”	North	Easting	2,294,175	US ft E
Longitude	90°	59’	12.6911”	West	Northing	9,904,225	US ft N
Latitude Decimal			27.27935875				
Longitude Decimal			-90.98685864				
FEL Green Canyon 679			2,625ft	US ft	Inline	5134	
FSL Green Canyon 679			4,225ft	US ft	Crossline	44161	
Water Depth: -4,834ft			Slope: 1.64° ESE				

There are no areas with the potential for a Sensitive Sessile Benthic Community within 2,000ft of the proposed location.

Conclusions and Recommendations: The proposed GC679-Z well location will not impact any sites favorable for development of sensitive sessile benthic communities.

Sincerely,
Anadarko Petroleum Corporation

Biological, Physical & Socio-Economic Plat



0 500 1,000 2,000 3,000 Feet

Figure Scale 1" : 2,000'

N

Proposed GC679-Z Surface Location (2,294,175ft E / 9,904,225ft N)

-4840 Seabed depth below sea surface, contoured at 20ft intervals

Note: No sensitive seabed biology interpreted in GC679

APPENDIX A – PUBLIC SHALLOW HAZARDS STATEMENTS

Public Shallow Hazards Statement – Proposed GC680-U Well Location

March 26, 2026

US Department of the Interior
Bureau of Ocean Energy Management
1201 Elmwood Park Blvd.
New Orleans, LA 70213-2394

Reference: Shallow Hazards Analysis
Green Canyon Block 680
(OCS-G-22987)

Ladies/Gentlemen:

Anadarko Petroleum Company contracted Xodus Group Inc. to prepare a Well Clearance Letter for the Proposed U well location in Block 680, Green Canyon Area (OCS-G-22987). This letter addresses seabed and shallow geologic conditions that may impact exploratory drilling operations within 2,000ft of the proposed well site. The depth limit of this site clearance assessment is -10,600ft below sea surface (5,195ft BML).

Seabed Hazards. The seabed at the proposed well is smooth with a gradient of 4.04° E. Within 2,000ft of the proposed well, numerous NNE to SSW trending shallow gullies or seafloor channels are present. The shallow gullies or seafloor channels are not expected to affect drilling operations. Soft clays are interpreted.

No seabed infrastructure or sonar targets occur within a 2,000ft radius.

There are no indications of seabed hydrocarbon fluid seeps within 2,000ft of the proposed well location.

Sub-Seabed Hazards.

A **Slight Shallow Water Flow Risk** is assigned to sand-rich intervals within Units B and C.
A **Slight Risk of Gas** and a **Moderate Shallow Water Flow Risk** is assigned to a sand-rich interval in Unit C.

Proposed GC680-U Location (Surface)								
Location Coordinates								
NAD 27 Datum - Clarke 1866 Ellipsoid					**UTM Zone 15 - CM 87° West**			
Latitude	27°	17'	36.1473"	North	Easting	2,311,250	US ft E	
Longitude	90°	56'	2.5179"	West	Northing	9,909,600	US ft N	
Latitude Decimal				27.29337425				
Longitude Decimal				-90.93403275				
FEL Green Canyon 680				1,390ft	US ft	Inline	5218	
FNL Green Canyon 680				6,240ft	US ft	Crossline	44933	
Water Depth: -5,405ft				Slope: 4.04° E				

Conclusions and Recommendations.

No problems are interpreted at seabed.

A **Slight Shallow Water Flow Risk** occurs within Units B and C.
A **Slight Risk of Gas** and a **Moderate Shallow Water Flow Risk** occur in Unit C.

Sincerely,

Anadarko Petroleum Corporation

APPENDIX B – Sensitive Sessile Benthic Community Statement

Sensitive Sessile Benthic Communities Statement – Proposed GC680-U Well Location

Anadarko Petroleum Corporation

March 26, 2026

US Department of the Interior
Bureau of Ocean Energy Management
1201 Elmwood Park Blvd.
New Orleans, LA 70213

Reference: Sensitive Sessile Benthic Community Summary
Proposed GC680-U Well Location in Green Canyon GC680 (OCS-G-22987)

Ladies/Gentlemen:

Anadarko Petroleum Corporation contracted Xodus Group Inc. to prepare a Well Clearance Letter for the Proposed U well location in Block 680, Green Canyon Area (OCS-G-22987). This letter addresses location proximity to potential sensitive sessile benthic community sites. This well will be drilled from a dynamically positioned drilling module; therefore, an anchoring assessment is not required.

This sensitive sessile benthic community summary letter is issued as a supplement to the Well Clearance Letter for this proposed well. A Biological, Physical and Socio-economic Plat is included illustrating the areas of potential seabed impact.

Potential Sensitive Sessile Benthic Communities

Features or areas that could support high-density sensitive sessile benthic communities are ***not*** located within 2,000 feet of any proposed mud and cuttings discharge location. No areas that could support benthic communities were identified in the vicinity of the well location.

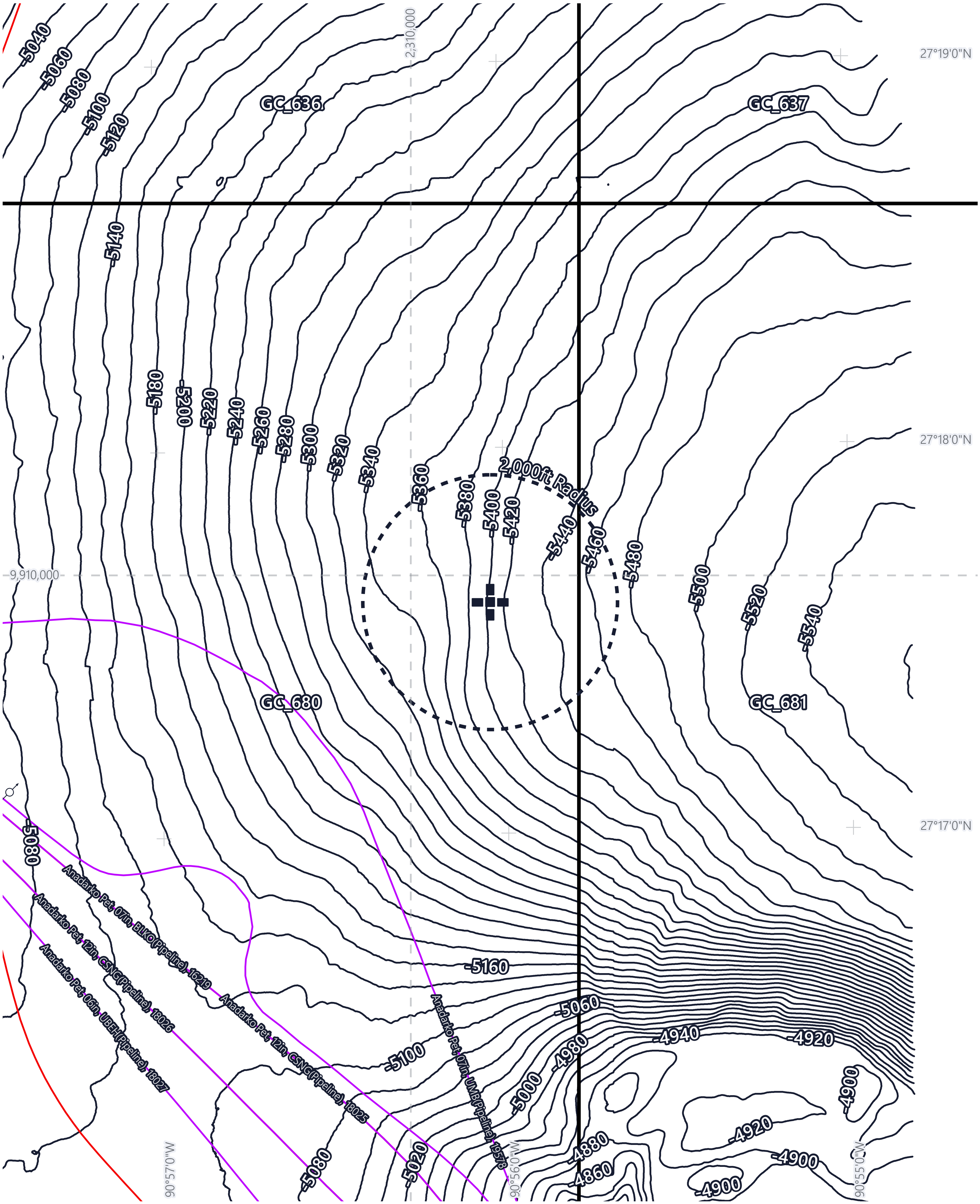
Proposed GC680-U Location (Surface)							
Location Coordinates							
NAD 27 Datum - Clarke 1866 Ellipsoid					**UTM Zone 15 - CM 87° West**		
Latitude	27°	17’	36.1473”	North	Easting	2,311,250	US ft E
Longitude	90°	56’	2.5179”	West	Northing	9,909,600	US ft N
Latitude Decimal	27.29337425						
Longitude Decimal	-90.93403275						
FEL Green Canyon 680	1,390ft			US ft	Inline	5218	
FNL Green Canyon 680	6,240ft			US ft	Crossline	44933	
Water Depth: -5,405ft	Slope: 4.04° E						

There are no areas with the potential for a Sensitive Sessile Benthic Community within 2,000ft of the proposed location.

Conclusions and Recommendations: The proposed GC680-U well location will not impact any sites favorable for development of sensitive sessile benthic communities.

Sincerely,
Anadarko Petroleum Corporation

Biological, Physical & Socio-Economic Plat



0 500 1,000 2,000 3,000 Feet

Figure Scale 1" : 2,000'

N

Proposed GC680-U Surface Location (2,311,250ft E / 9,909,600ft N)

-5400 Seabed depth below sea surface, contoured at 20ft intervals

Note: No sensitive seabed biology interpreted in GC680

APPENDIX A – PUBLIC SHALLOW HAZARDS STATEMENTS

Public Shallow Hazards Statement – Proposed GC680-V Well Location

March 26, 2026

US Department of the Interior
Bureau of Ocean Energy Management
1201 Elmwood Park Blvd.
New Orleans, LA 70213-2394

Reference: Shallow Hazards Analysis
Green Canyon Block 680
(OCS-G-22987)

Ladies/Gentlemen:

Anadarko Petroleum Company contracted Xodus Group Inc. to prepare a Well Clearance Letter for the Proposed V well location in Block 680, Green Canyon Area (OCS-G-22987). This letter addresses seabed and shallow geologic conditions that may impact exploratory drilling operations within 2,000ft of the proposed well site. The depth limit of this site clearance assessment is -10,600ft below sea surface (5,377ft BML).

Seabed Hazards. The seabed at the proposed well is smooth with a gradient of 3.0° E. Within 2,000ft of the proposed well, one NNE to SSW trending shallow gully or seafloor channel is present at the south end of the 2,000ft radius. This shallow gully or seafloor channel is not expected to affect drilling operations. Soft clays are interpreted at the proposed well location.

Three NNE to SSW trending drag scars exist within the 2,000ft radius and are not expected to affect drilling operations.

No seabed infrastructure or sonar targets occur within a 2,000ft radius.

There are no indications of seabed hydrocarbon fluid seeps within 2,000ft of the proposed well location.

Sub-Seabed Hazards.

A **Slight Shallow Water Flow Risk** is assigned to sand-rich intervals within Unit B.
A **Slight Risk of Gas** and a **Moderate Shallow Water Flow Risk** is assigned to sand-rich intervals in Unit C.

Proposed GC680-V Location (Surface)								
Location Coordinates								
NAD 27 Datum - Clarke 1866 Ellipsoid					UTM Zone 15 - CM 87° West			
Latitude	27°	18’	5.9912”	North	Easting	2,306,898	US ft E	
Longitude	90°	56’	50.2070”	West	Northing	9,912,543	US ft N	
Latitude Decimal			27.30166422					
Longitude Decimal			-90.94727972					
FEL Green Canyon 680			5,742ft		US ft	Inline	5166	
FNL Green Canyon 680			3,297ft		US ft	Crossline	44885	
Water Depth: -5,223ft			Slope: 3.0° E					

Conclusions and Recommendations.

No problems are interpreted at seabed.

A **Slight Shallow Water Flow Risk** occurs within Unit B.
A **Slight Risk of Gas** and a **Moderate Shallow Water Flow Risk** is assigned to sand-rich intervals in Unit C.

Sincerely,

Anadarko Petroleum Corporation

APPENDIX B – Sensitive Sessile Benthic Community Statement

Sensitive Sessile Benthic Communities Statement – Proposed GC680-V Well Location

Anadarko Petroleum Corporation

March 26, 2026

US Department of the Interior
Bureau of Ocean Energy Management
1201 Elmwood Park Blvd.
New Orleans, LA 70213

Reference: Sensitive Sessile Benthic Community Summary
Proposed GC680-V Well Location in Green Canyon GC680 (OCS-G-22987)

Ladies/Gentlemen:

Anadarko Petroleum Corporation contracted Xodus Group Inc. to prepare a Well Clearance Letter for the Proposed V well location in Block 680, Green Canyon Area (OCS-G-22987). This letter addresses location proximity to potential sensitive sessile benthic community sites. This well will be drilled from a dynamically positioned drilling module; therefore, an anchoring assessment is not required.

This sensitive sessile benthic community summary letter is issued as a supplement to the Well Clearance Letter for this proposed well. A Biological, Physical and Socio-economic Plat is included illustrating the areas of potential seabed impact.

Potential Sensitive Sessile Benthic Communities

Features or areas that could support high-density sensitive sessile benthic communities are ***not*** located within 2,000 feet of any proposed mud and cuttings discharge location. No areas that could support benthic communities were identified in the vicinity of the well location.

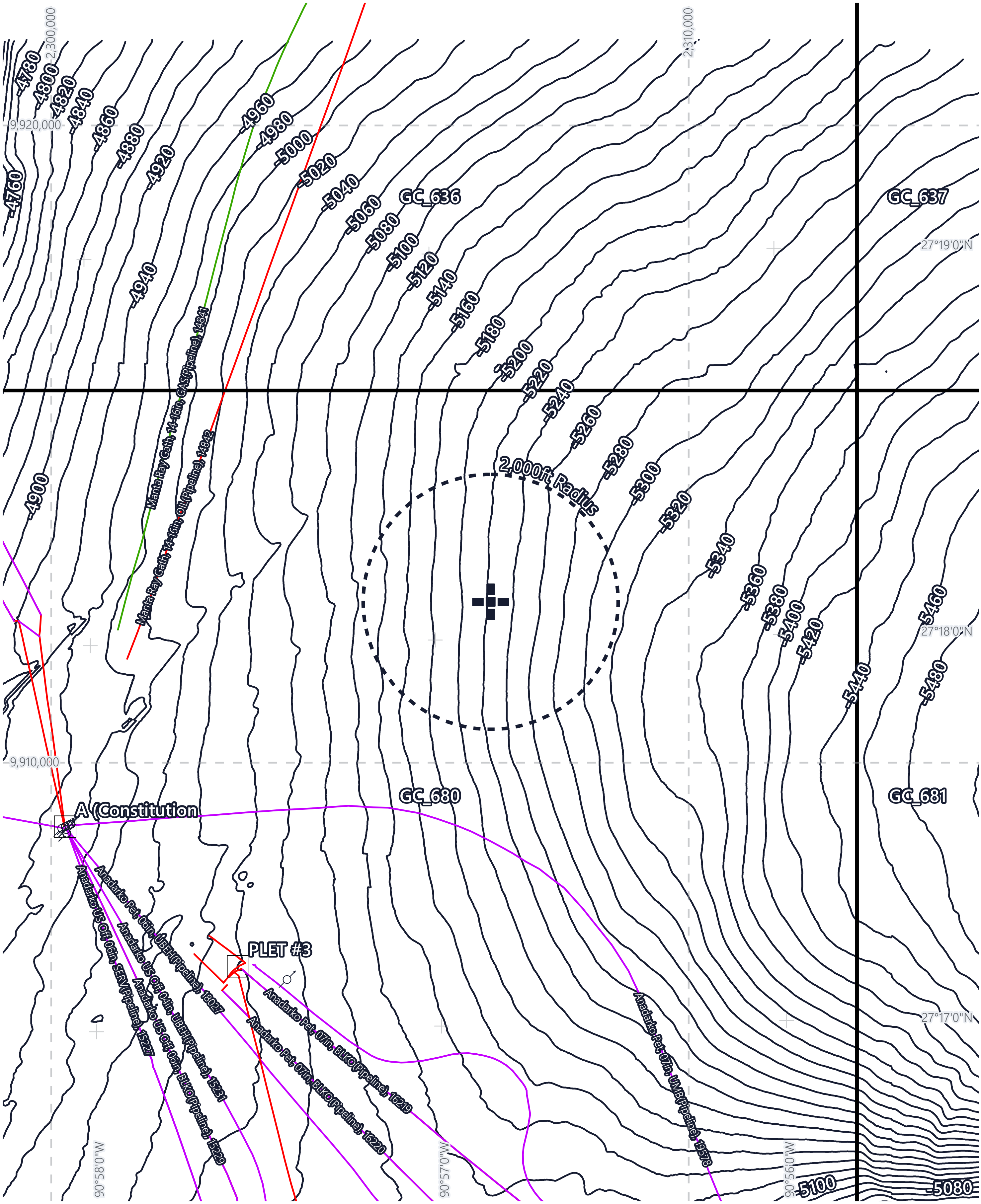
Proposed GC680-V Location (Surface)							
Location Coordinates							
NAD 27 Datum - Clarke 1866 Ellipsoid					**UTM Zone 15 - CM 87° West**		
Latitude	27°	18’	5.9912”	North	Easting	2,306,898	US ft E
Longitude	90°	56’	50.2070”	West	Northing	9,912,543	US ft N
Latitude Decimal			27.30166422				
Longitude Decimal			-90.94727972				
FEL Green Canyon 680			5,742ft		US ft	Inline	5166
FNL Green Canyon 680			3,297ft		US ft	Crossline	44885
Water Depth: -5,223ft			Slope: 3.0° E				

There are no areas with the potential for a Sensitive Sessile Benthic Community within 2,000ft of the proposed location.

Conclusions and Recommendations: The proposed GC680-V well location will not impact any sites favorable for development of sensitive sessile benthic communities.

Sincerely,
Anadarko Petroleum Corporation

Biological, Physical & Socio-Economic Plat



0 500 1,000 2,000 3,000 Feet

Figure Scale 1" : 2,000'

N

Proposed GC680-V Surface Location
(2,306,898ft E / 9,912,543ft N)

-5220 Seabed depth below sea surface, contoured at 20ft intervals

Note: No sensitive seabed biology interpreted in GC680

APPENDIX A – PUBLIC SHALLOW HAZARDS STATEMENTS

Public Shallow Hazards Statement – Proposed GC680-X Well Location

May 15, 2024

US Department of the Interior
Bureau of Ocean Energy Management
1201 Elmwood Park Blvd.
New Orleans, LA 70213-2394

Reference: Shallow Hazards Analysis
Green Canyon Block 680
(OCS-G 36446)

Ladies/Gentlemen:

Anadarko Exploration Company contracted Ocean Geo Solutions Inc. to prepare a Well Clearance Letter for the Proposed GC680-X well location in Block 680, Green Canyon Area (OCS-G-22987). This letter addresses seabed and shallow geologic conditions that may impact exploratory drilling operations within 2,000ft of the proposed well site. The depth limit of this site clearance assessment is -10,600ft below sea surface (5,578ft BML).

Seabed Hazards. The seabed at the proposed well is smooth located between two seabed furrows, with a gradient of <1.0° to the east. The proposed well is in the south-central of the block with no other significant seabed features observed within 2,000ft of the proposed well.

There are no indications of seabed hydrocarbon fluid seeps within 2,000ft of the proposed well location.

No seabed infrastructure occurs within a 2,000ft radius. Two sonar targets, interpreted as modern debris occur in the eastern part of the 2,000ft radius.

Sub-Seabed Hazards. Identified amplitude anomalies indicative of shallow gas **do** occur at the proposed vertical borehole at the level of a <40ft thick sand at -10,083ft below sea surface (5,016ft BML). However, Full Well Control should have been established at these depths.

A **Slight Shallow Water Flow Risk** is assigned to sand-rich intervals within Unit B, Unit C and Unit D.

Proposed GC680-X Location (Surface)							
Location Coordinates							
NAD 27 Datum - Clarke 1866 Ellipsoid					UTM Zone 15 - CM 87° West		
Latitude	27°	10’	26.210”	North	Easting	2,299,900	US ft E
Longitude	90°	58’	09.595”	West	Northing	9,902,350	US ft N
Latitude Decimal			27.27394739				
Longitude Decimal			-90.96933216				
FWL Green Canyon 680			3,100ft	US ft	Inline	5189	
FSL Green Canyon 680			2,350ft	US ft	Crossline	44293	
Water Depth: -5,022ft			Slope: <1.0° East				

Conclusions and Recommendations.

No problems are interpreted at seabed.

A **Slight Shallow Water Flow Risk** occurs in intervals of Unit B, C and D.

A **Moderate Risk of Gas** is interpreted at the level of a <40ft thick sand interbed within Unit D   Full Well Control should have been established at these depths.

Sincerely,

Anadarko Petroleum Corporation

APPENDIX B – Sensitive Sessile Benthic Community Statement

Sensitive Sessile Benthic Communities Statement – Proposed GC680-X Well Location

Anadarko Petroleum Corporation

May 15, 2024

US Department of the Interior
Bureau of Ocean Energy Management
1201 Elmwood Park Blvd.
New Orleans, LA 70213

Reference: Sensitive Sessile Benthic Community Summary
Proposed GC680-X Well Location in Green Canyon GC680 (OCS-G 22987)

Ladies/Gentlemen:
Anadarko Petroleum Corporation contracted Ocean Geo Solutions Inc. to prepare a Well Clearance Letter for the Proposed GC680-X well location in Block 680, Green Canyon Area (OCS-G-22987). This letter addresses location proximity to potential sensitive sessile benthic community sites. This well will be drilled from a dynamically positioned drilling module; therefore, an anchoring assessment is not required.

This sensitive sessile benthic community summary letter is issued as a supplement to the Well Clearance Letter for this proposed well. A Biological, Physical and Socio-economic Plat is included illustrating the areas of potential seabed impact.

Potential Sensitive Sessile Benthic Communities
Features or areas that could support high-density sensitive sessile benthic communities are ***not*** located within 2,000 feet of any proposed mud and cuttings discharge location. No areas that could support benthic communities were identified in the vicinity of the well location.

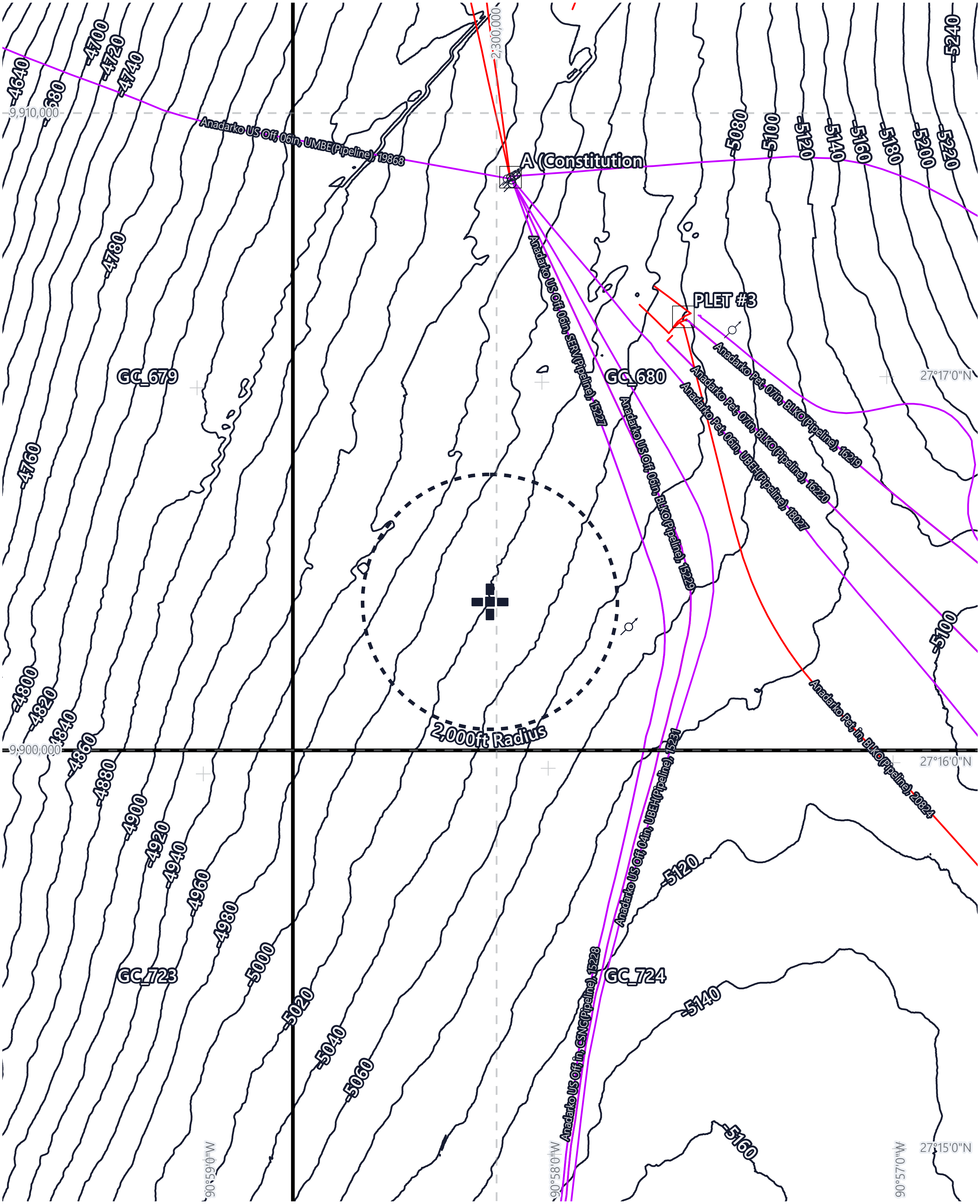
Proposed GC680-X Location (Surface)							
Location Coordinates							
NAD 27 Datum - Clarke 1866 Ellipsoid					**UTM Zone 15 - CM 87° West**		
Latitude	27°	10’	26.210”	North	Easting	2,299,900	US ft E
Longitude	90°	58’	09.595”	West	Northing	9,902,350	US ft N
Latitude Decimal			27.27394739				
Longitude Decimal			-90.96933216				
FWL Green Canyon 680			3,100ft	US ft	Inline	5189	
FSL Green Canyon 680			2,350ft	US ft	Crossline	44293	
Water Depth: -5,022ft			Slope: <1.0° East				

There are no areas with the potential for a Sensitive Sessile Benthic Community within 2,000ft of the proposed location.

Conclusions and Recommendations: The proposed GC680-X well location will not impact any sites favorable for development of sensitive sessile benthic communities.

Sincerely,
Anadarko Petroleum Corporation

Biological, Physical & Socio-Economic Plat



0 500 1,000 2,000 3,000 Feet

Figure Scale 1" : 2,000'

N

Proposed GC680-X Surface Location
(2,299,900ft E / 9,902,350ft N)

-5020 Seabed depth below sea surface, contoured at 20ft intervals

Note: No sensitive seabed biology interpreted in GC680.

(f) Shallow Hazards Assessment

Shallow Hazards Site Clearance Letters for the proposed well locations in GC 679, 680 are enclosed as **Attachment C-4.** There are seven total Site Clearance Letters included with this Supplemental EP. Multiple well locations will utilize the primary location's site clearance letter since within the same 500' surface radius.

Locations:	**Site Clearance Letter:**
GC 679 V, VV	Reference GC 680 X Site Clearance Letter
GC 679 W, WW, WWW	Reference GC 679 W Site Clearance Letter
GC 679 X, XX, XXX	Reference GC 679 X Site Clearance Letter
GC 679 Y, YY, YYY	Reference GC 679 Y Site Clearance Letter
GC 679 Z, ZZ, ZZZ	Reference GC 679 Z Site Clearance Letter
GC 680 U, UU, UUU	Reference GC 680 U Site Clearance Letter
GC 680 V, VV, VVV	Reference GC 680 V Site Clearance Letter

(g) High-resolution Seismic Lines

High resolution seismic lines are enclosed as **Attachment C-5.**

(h) Stratigraphic Column

A generalized stratigraphic column depicting the wells from the seafloor to total depth is included as **Attachment C-6.**

(i) Time vs. Depth Tables

The proposed activities under this Supplemental EP are not considered to be in areas where there is no well control. Therefore, a seismic travel time versus depth table is not required per NTL No. 2008-G04.

SECTION D
HYDROGEN SULFIDE INFORMATION

Discussions regarding geologic information are considered proprietary and have been omitted from this public copy of the Supplemental EP.

Classification
In accordance with Title 30 CFR 250.490(c), Anadarko requests that the area(s) of proposed operations be classified by the BOEM as H_2S absent.

H_2S Contingency Plan
Anadarko does not anticipate encountering H_2S while conducting the proposed exploratory activities, therefore a contingency plan is not required at this time.

Modeling Report
Anadarko does not anticipate encountering H_2S while conducting the proposed exploratory activities, therefore a modeling report is not required at this time.

SECTION E
BIOLOGICAL, PHYSICAL, AND SOCIOECONOMIC INFORMATION

(a) Chemosynthetic Communities Report

The seafloor disturbing activities proposed in this plan are in approximately 4,652' – 5,405' of water. The wells will be drilled with a DP drillship or DP semi-submersible drilling unit.

Maps

Maps prepared using 3-D seismic data to depict bathymetry, seafloor and shallow geological features, and surface location of the proposed wells are included in **Sections A and C.**

Analysis

Features or areas that could support high-density chemosynthetic communities are not located within 2,000' of each proposed muds and cuttings discharge location.

Features or areas that could support high-density chemosynthetic communities are not located within 250' of any seafloor disturbances. Please refer to site clearance letters included in **Section C** for summary statements for each well.

(b) Topographic Features Map

The proposed activities are not within 1,000' of a no-activity zone or within the 3-mile radius zone of an identified topographic feature. Therefore, no map is required per NTL No. 2008-G04.

(c) Topographic Features Statement (Shunting)

Anadarko does not plan to drill more than two wells from the same surface location within the Protective Zone of an identified topographic feature. Therefore, the topographic features statement required by NTL No. 2008-G04 is not applicable.

(d) Live Bottoms (Pinnacle Trend) Map

The activities proposed in this plan are not within 200' of any pinnacle trend feature with vertical relief equal to or greater than 8'. Therefore, no map is required per NTL No. 2008-G04.

(e) Live Bottoms (Low Relief) Map

The activities proposed in this plan are not within 100' of any live bottom low relief features. Therefore, no map is required per NTL No. 2008-G04.

(f) Potentially Sensitive Biological Features

The activities proposed in this plan are not within 200' of any potentially sensitive biological features. Therefore, no map is required per NTL No. 2008-G04.

(g) Threatened and Endangered Species Information

Under Section 7 of the Endangered Species Act (ESA) all federal agencies must ensure that any actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of a listed species, or destroy or adversely modify its designated critical habitat.

In accordance with the 30 CFR 250, Subpart B, effective May 14, 2007, and further outlined in Notice to Lessees (NTL) 2008-G04, lessees/operators are required to address site-specific information on the presence of federally listed threatened or endangered species and critical habitat designated under the ESA and marine mammals protected under the Marine Mammal Protection Act (MMPA) in the area of proposes activities under this plan.

Currently there are no designated critical habitats for the listed species in the Gulf of Mexico Outer Continental Shelf; however, it is possible that one or more of these species could be seen in the area of our operations. The following table reflects the Federally-listed endangered and threatened species in the lease area and along the northern Gulf coast:

The Environmental Impact Analysis (EIA) in **Section N** of this plan further discusses potential impacts and mitigation measures related to threatened and endangered species.

Federally listed Endangered and Threatened species potentially occurring in the project area and along the northern Gulf Coast. Adapted from: U.S. Fish and Wildlife Service (2025) and National and Oceanic Atmospheric Administration Fisheries (2025).

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in Gulf of America
			Project Area	Coastal	
Marine Mammals					
Rice's whale	*Balaenoptera ricei*	E	X	--	None
Sperm whale	*Physeter macrocephalus*	E	X	--	None
West Indian manatee	*Trichechus manatus*[1]	T	--	X	Florida (Peninsular)
Sea Turtles					
Loggerhead turtle	*Caretta caretta*	T,E[2]	X	X	Nesting beaches and nearshore reproductive habitat in Mississippi, Alabama, and Florida (Panhandle); *Sargassum* habitat including most of the central & western Gulf of America
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

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in Gulf of America
			Project Area	Coastal	
Birds					
Piping Plover	*Charadrius melodus*	T	--	X	Coastal Texas, Louisiana, Mississippi, Alabama, and Florida (Panhandle)
Whooping Crane	*Grus americana*	E	--	X	Coastal Texas (Aransas National Wildlife Refuge)
Black-capped Petrel	*Pterodroma hasitata*	E	X	--	None
Rufa Red Knot	*Calidris canutus rufa*	T	--	X	None
Fishes					
Oceanic whitetip shark	*Carcharhinus longimanus*	T	X	--	None
Giant manta ray	*Mobula birostris*	T	X	X	None
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	T	--	X	Coastal Louisiana, Mississippi, Alabama, and Florida (Panhandle)
Nassau grouper	*Epinephelus striatus*	T	--	X	None
Smalltooth sawfish	*Pristis pectinata*	E	--	X	Southwest Florida
Invertebrates					
Elkhorn coral	*Acropora palmata*	T	--	X	Florida Keys and the Dry Tortugas
Staghorn coral	*Acropora cervicornis*	T	--	X	Florida Keys and the Dry Tortugas
Pillar coral	*Dendrogyra cylindrus*	T	--	X	Southeast Florida and Florida Keys, Puerto Rico, St. Thomas, St. John, St. Croix, and Navassa Island
Rough cactus coral	*Mycetophyllia ferox*	T	--	X	Southeast Florida and Florida Keys, Puerto Rico, St. Thomas, St. John, St. Croix, and Navassa Island
Lobed star coral	*Orbicella annularis*	T	--	X	Southeast Florida and Florida Keys, Puerto Rico, St. Thomas, St. John, St. Croix, Navassa Island, East and West Flower Garden Banks, Rankin Bright Bank, Geyer Bank, and McGrail Bank
Invertebrates					
Mountainous star coral	*Orbicella faveolata*	T	--	X	Southeast Florida and Florida Keys, Puerto Rico, St. Thomas, St. John, St. Croix, Navassa Island, East and West Flower Garden Banks, Rankin Bright Bank, Geyer Bank, and McGrail Bank
Boulder star coral	*Orbicella franksi*	T	--	X	Southeast Florida and Florida Keys, Puerto Rico, St. Thomas, St. John, St. Croix, Navassa Island, East and West Flower Garden Banks, Rankin Bright Bank, Geyer Bank, and McGrail Bank
Panama City crayfish	*Procambarus econfinae*	T	--	X	South-central Bay County, Florida
Queen conch	*Aliger gigas*	T	--	X	None

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in Gulf of America
			Project Area	Coastal	
Terrestrial Mammals					
Beach mice (Alabama, Choctawhatchee, Perdido Key, St. Andrew)	*Peromyscus polionotus*	E	--	X	Alabama and Florida (Panhandle) beaches
Florida salt marsh vole	*Microtus pennsylvanicus dukecampbelli*	E	--	X	None

E = Endangered; T = Threatened; X = potentially present; -- = not present.

1. There are two subspecies of West Indian manatee: the Florida manatee (*T. m. latirostris*), which ranges from the northern Gulf of America 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 America. On 30 March 2017, the USFWS announced the West Indian manatee, including the Florida manatee subspecies, was reclassified as Threatened.

2. 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).

(h) Archaeological Report

GC 679 and 680 are not designated as an area of high archaeological potential. However, in accordance with NTL No. 2005-G07, "Archaeological Resource Surveys and Reports," and NTL No. 2011-JOINT-G01, "Revisions to the List of OCS Lease Blocks Requiring Archaeological Resource Surveys and Reports," an archaeological resource survey report was submitted with the Initial EP (Plan Control No. N-10245).

Archaelogical and Geohazard Assessment Report
Blocks 679, 680, 723, & 724
Green Canyon Area, Gulf of Mexico
Oceaneering Document Number: 227954-OII-RPT-ABH-01-R0
Project Date Range: Oct. 29- Nov. 12, 2023

(i) Air and Water Quality Information

This Supplemental EP does not propose activities for which the State of Florida is an affected State. Therefore, the discussion required per NTL 2008-G04 is not applicable to this Supplemental EP.

(j) Socioeconomic Information

The activities proposed in this plan are not located offshore Florida. Therefore, socioeconomic information required per NTL 2008-G04 is not applicable to this Supplemental EP.

SECTION F
WASTE AND DISCHARGE INFORMATION

The following estimates were prepared utilizing Anadarko's experience with similar drilling operations. Estimated maximum discharge rates are reflected below. Projected amounts may vary during the course of drilling and/or completion operations.

Total amount assumes drilling and completing 20 wells with 4,000 total number of days (200 days to drill and complete each well).

(a) Projected Generated Wastes

Type of Waste	Composition	Projected Amount	Treatment/Storage/Disposal
Synthetic-based drilling fluids	Synthetic-based drilling muds	28,500 bbls/well	Transport to shore in DOT approved containers to an approved waste disposal facility. If recycled or reused, returned to vendor (Bariod or MI Swaco).
Cuttings wetted with synthetic-based fluids	Cuttings coated with synthetic drilling muds/fluids, including drilled out cement	7,800 bbls/well	Treated and discharge overboard **Note, an estimated 5-10% of cuttings may be transported to shore in DOT approved containers for disposal.*
Water-based drilling fluids	Water based drilling muds (NaCl saturated, seawater, freshwater, barite)	43,000 bbls/well**	Discharge overboard or at seafloor
Cuttings wetted with water-based fluids	Cuttings coated with water-based drilling muds/fluids	0 bbls/well 3,300 bbls/well	Discharge overboard Discharge at seafloor
Well treatment fluids	Ethylene glycol Methanol	13,333 bbls total 3,333 bbls total	Transport to shore in DOT approved containers to an approved waste disposal facility.
Used - Completion/ Workover/ Stimulation Fluids	Brine, acid, prop sand, debris, gelled fluids, dead oil	3,000 bbls/well	Transport to shore in DOT approved containers to an approved waste disposal facility.
Non-pollutant completion fluids	Low density uninhibited completion brines	5,000 bbls/well	Discharge overboard
Unused – Completion/ Workover/ Stimulation fluids	Brine, acid, prop sand, debris, gelled fluids, dead oil	3,000 bbls/well	Transport to shore in DOT approved containers for reuse or to an approved waste disposal facility.
Trash and debris	Refuse generated during operations	6,667 bbls total	Transport to shore in DOT approved containers for disposal.
Sanitary Wastes*	Treated human body waste	20,000,000 gals total	Chlorinate and discharge overboard
Domestic Waste*	Gray water	20,000,000 gals total	Chlorinate and discharge overboard
Deck drainage	Platform washings and rainwater	14,000,000 bbls total	Treat for oil and grease and discharge overboard
Produced water	N/A	N/A	N/A
Desalinization Unit	Seawater	1,400,000 bbls total	Discharge overboard
Wash water	Drill water (fresh)	200,000 bbls total	Discharge overboard
Blowout preventer fluid	Blend (3% Stack Magic & Filtered Fresh Water)	528,571 gals total	Discharge at seafloor
Ballast water	Seawater	47,650 m3/year	Discharge overboard
Bilge water	Seawater	1,268,000 bbls total	Discharge overboard through 15 ppm equipment

Type of Waste	Composition	Projected Amount	Treatment/Storage/Disposal
Excess cement at the seafloor	Nitrified cement slurry	985 bbls/well	Discharge at seafloor
Fire water	Seawater	137,142 bbls/day/well	Discharge overboard
Cooling water	Seawater	137,142 bbls/day/well	Discharge overboard
Produced Sand	N/A	N/A	N/A
Used oil	Excess oil from engines	14,333 bbls total	Transport in DOT approved containers to shore for recycling

* *The rig is designed for maximum personnel capacity of 200 people. The discharge rates are based off maximum personnel capacity but will generally not have these many personnel onboard during drilling and/or completion operations.*
*******The actual volume of water-based ordered out will be an estimated 27,000 bbls/well of mud. Once on location this volume will be cut back and mixed with seawater to different desired mud weights which will increase the volume that is discharged at the seafloor. The estimated volume that will be discharged at the seafloor will be approximately 43,000 bbls/well (Note: There will be 20 potential wells drilled, for a total of 860,000 bbls.)*

(b) Projected Ocean Discharges

Type of Waste	Total Amount to be Discharged	Discharge Rate	Discharge Method
Sanitary Wastes*	20,000,000 gals total	25 gals per person daily	Chlorinate and discharge overboard
Domestic waste*	20,000,000 gals total	25 gals per person daily	Chlorinate and discharge overboard
Deck drainage	14,000,000 bbls total	3,500 bbls/day	Treat for oil and grease and discharge overboard
Desalinization Unit	1,400,000 bbls total	350 bbls/day	Discharge overboard
Wash water	200,000 bbls total	50 bbls/day	Discharge overboard
Blowout preventer fluid	528,571 gals total	925 gals/week/well; Vents on a weekly basis	Discharge at seafloor
Ballast water	47,650 m3/year	Not continuous	Discharge overboard
Bilge water	1,268,000 bbls total	317 bbls/day	Discharge overboard through 15 ppm equipment
Excess cement at the seafloor	19,700 bbls total	20 bbls/min	Discharge at seafloor
Fire water	548,568,000 bbls total	137,142 bbls/day	Discharge overboard
Cooling water	548,568,000 bbls total	137,142 bbls/day	Discharge overboard
Cuttings wetted with Water-based fluids	0 bbls total 66,000 bbls total	1,000 bbls/hr max	Discharge overboard Discharge at seafloor
Water-based drilling fluids**	860,000 bbls total**	1,000 bbls/hr max	Discharge at seafloor or overboard
Cuttings wetted with Synthetic-based fluids	156,000 bbls total	1,000 bbls/hr max	Treated and discharge overboard **Note, an estimated 5-10% of cuttings may be transported to shore in tanks and/or cutting boxes and on to the base/transfer station if oil still remains.*
Non-pollutant completion fluids	100,000 bbls total	100 bbl/hour	Discharge overboard

**The rig is designed for maximum personnel capacity of 200 people. The discharge rates are based off of maximum personnel capacity but will generally not have these many personnel onboard during drilling and/or completion operations.*
*******The actual volume of water-based ordered out will be an estimated 27,000 bbls/well of mud. Once on location this volume will be cut back and mixed with seawater to different desired mud weights which will increase the volume that is discharged at the seafloor. The estimated volume that will be discharged at the seafloor will be approximately 43,000 bbls/well (Note: There will be 20 potential wells drilled, for a total of 860,000 bbls.)*

(c) Modeling Report

The proposed activities under this plan do not meet the U.S. Environmental Protection Agency requirements for an individual NPDES permit. Therefore, modeling report requirements per NTL No. 2020-G02 is not applicable to this Supplemental EP.

SECTION G
AIR EMISSIONS INFORMATION

(a) Screening Questions

Screening Questions for EP's	Yes	No
Is any calculated Complex Total (CT) Emission amount (in tons) associated with your proposed exploration activities more than 90% of the amounts calculated using the following formulas: CT = $3400D^{2/3}$ for CO, and CT = 33.3D for the other air pollutants (where D = distance to shore in miles)?		No
Do your emission calculations include any emission reduction measures or modified emission factors?		No
Are your proposed exploration activities located east of 87.5 W longitude?		No
Do you expect to encounter H_2S at concentrations greater than 20 parts per million (ppm)?		No
Do you propose to flare or vent natural gas for more than 48 continuous hours from any proposed well?		No
Do you propose to burn produced hydrocarbon liquids?		No

(b) Emissions Worksheets

Air emission worksheets have been prepared utilizing the maximum horsepower rating from the *Noble BlackHawk.* The *Noble BlackHawk* has eight main engines. The average number of engines on-line at once will be four engines. A different rig may be utilized (DP drillship or DP semi-submersible); but the horsepower rating, average daily fuel use, and air emissions will be equal to, or less than, the calculated plan emission amounts shown on the following pages. Air emission worksheets are enclosed as **Attachment G-1.**

(c) Summary Information

The following tables summarize information regarding the peak year emissions generated from the Plan Emissions and Complex Total Emissions:

GC 679 (Surface location)
If drilled with a DP Drillship or DP Semi (equal to or less than the Noble BlackHawk):

Air Pollutant		Plan Emission Amounts[1] (tons)	Calculated Exemption Amounts[2] (tons)	Calculated Complex Total Emission Amounts[3] (tons)
Total suspended particulates (TSP)		102.21	3,962.70	N/A
Particulate matter 10 (PM_{10})		61.67	N/A	N/A
Particulate matter 2.5 ($PM_{2.5}$)		59.82	N/A	N/A
Sulphur dioxide (SO_2)		1.49	3,962.70	N/A
Nitrogen oxides (NO_x)		2,449.06	3,962.70	N/A
Volatile organic compounds (VOC)		70.75	3,962.70	N/A
Carbon monoxide (CO)		387.27	82,257.76	N/A

GC 680 (Surface location)

If drilled with a DP Drillship or DP Semi (equal to or less than the Noble BlackHawk):

Air Pollutant		Plan Emission Amounts[1] (tons)	Calculated Exemption Amounts[2] (tons)	Calculated Complex Total Emission Amounts[3] (tons)
Total suspended particulates (TSP)		102.21	3,962.70	N/A
Particulate matter 10 (PM_{10})		61.67	N/A	N/A
Particulate matter 2.5 ($PM_{2.5}$)		59.82	N/A	N/A
Sulphur dioxide (SO_2)		1.49	3,962.70	N/A
Nitrogen oxides (NO_x)		2,449.06	3,962.70	N/A
Volatile organic compounds (VOC)		70.75	3,962.70	N/A
Carbon monoxide (CO)		387.27	82,257.76	N/A

The air emission calculations were calculated by:

Teri Powell
832-636-1261 office
Teri_Powell@oxy.com

COMPANY	Anadarko Petroleum Corporation
AREA	Green Canyon
BLOCK	679
LEASE	OCS-G 21811
FACILITY	N/A
WELL	**GC 679** W,WW,WWW,X,XX,XXX,Y,YY,YYY,Z,ZZ,ZZZ
COMPANY CONTACT	Teri Powell
TELEPHONE NO.	832-636-1261
REMARKS	Drill and complete 12 new wells with surface locations in GC 679 (200 days each; 2,400 total). The approved air emissions for the Constitution facility currently reflect max throughput volumes, therefore these drilling/completion activities will not change the facilities previously approved emissions.

PLAN - NEW Proposed Activity		Proposed Vessel Type	Estimated Start Date	Estimated End Date	Max. Anticipated No. of Days
Surface Location GC 679					
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 W		MODU	1/1/2027	7/20/2027	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 X		MODU	2/1/2028	8/19/2028	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 Y		MODU	3/1/2029	9/17/2029	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 Z		MODU	4/1/2030	10/18/2030	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 WW		MODU	1/1/2031	7/20/2031	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 XX		MODU	2/1/2032	8/19/2032	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 YY		MODU	3/1/2033	9/17/2033	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 ZZ		MODU	4/1/2034	10/18/2034	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 WWW		MODU	1/1/2035	7/20/2035	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 XXX		MODU	2/1/2036	8/19/2036	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 YYY		MODU	3/1/2037	9/17/2037	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 ZZZ		MODU	4/1/2038	10/18/2038	200 days
** The Activity Schedule is denoted for optionaility, start date may change in the future.*					
Not all locations may be drilled in a year and denoted for air emission coverage.					

AIR EMISSIONS COMPUTATION FACTORS

Fuel Usage Conversion Factors	Natural Gas Turbines				Natural Gas Engines		Diesel Recip. Engine		Diesel Turbines			
	SCF/hp-hr	9.524			SCF/hp-hr	7.143	GAL/hp-hr	0.0514	GAL/hp-hr	0.0514		

Equipment/Emission Factors	units	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	REF.	DATE	Reference Links
Natural Gas Turbine	g/hp-hr		0.0086	0.0086	0.0026	1.4515	0.0095	N/A	0.3719	N/A	AP42 3.1-1& 3.1-2a	4/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s01.pdf
RECIP. 2 Cycle Lean Natural Gas	g/hp-hr		0.1293	0.1293	0.0020	6.5998	200.0000	N/A	1.2009	N/A	AP42 3.2-1	7/00	https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s02.pdf
RECIP. 4 Cycle Lean Natural Gas	g/hp-hr		0.0002	0.0002	0.0020	2.8814	0.4014	N/A	1.8949	N/A	AP42 3.2-2	7/00	https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s02.pdf
RECIP. 4 Cycle Rich Natural Gas	g/hp-hr		0.0323	0.0323	0.0020	7.7224	0.1021	N/A	11.9408	N/A	AP42 3.2-3	7/00	https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s02.pdf
Diesel Recip. < 600 hp	g/hp-hr	1	1	1	0.0279	14.1	1.04	N/A	3.03	N/A	AP42 3.3-1	10/96	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s03.pdf
Diesel Recip. > 600 hp	g/hp-hr	0.32	0.182	0.178	0.0055	10.9	0.29	N/A	2.5	N/A	AP42 3.4-1 & 3.4-2	10/96	https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s04.pdf
Diesel Boiler	lbs/bbl	0.0840	0.0420	0.0105	0.0089	1.0080	0.0084	5.14E-05	0.2100	0.0336	AP42 1.3-6; Pb and NH3: WebFIRE (08/2018)	9/98 and 5/10	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s03.pdf https://cfpub.epa.gov/webfire/
Diesel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0013	4.45E-05	0.0105	N/A	AP42 3.1-1 & 3.1-2a	4/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s01.pdf
Dual Fuel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0095	4.45E-05	0.3719	0.0000	AP42 3.1-1& 3.1-2a; AP42 3.1-1 & 3.1-2a	4/00	https://cfpub.epa.gov/webfire/
Vessels – Propulsion	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Vessels – Drilling Prime Engine, Auxiliary	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	
Vessels – Diesel Boiler	g/hp-hr	0.0466	0.1491	0.1417	0.4400	1.4914	0.0820	3.73E-05	0.1491	0.0003	USEPA 2017 NEI;TSP (units converted) refer to Diesel Boiler Reference	3/19	
Vessels – Well Stimulation	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	
Natural Gas Heater/Boiler/Burner	lbs/MMscf	7.60	1.90	1.90	0.60	190.00	5.50	5.00E-04	84.00	3.2	AP42 1.4-1 & 1.4-2; Pb and NH3: WebFIRE (08/2018)	7/98 and 8/18	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf https://cfpub.epa.gov/webfire/
Combustion Flare (no smoke)	lbs/MMscf	0.00	0.00	0.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	https://www3.epa.gov/ttn/chief/ap42/ch13/final/C13S05_02-05-18.pdf
Combustion Flare (light smoke)	lbs/MMscf	2.10	2.10	2.10	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (medium smoke)	lbs/MMscf	10.50	10.50	10.50	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (heavy smoke)	lbs/MMscf	21.00	21.00	21.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Liquid Flaring	lbs/bbl	0.42	0.0966	0.0651	5.964	0.84	0.01428	5.14E-05	0.21	0.0336	AP42 1.3-1 through 1.3-3 and 1.3-5	5/10	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s03.pdf
Storage Tank	tons/yr/tank						4.300				2014 Gulfwide Inventory; Avg emiss (upper bound of 95% CI)	2017	https://www.boem.gov/environment/environmental-studies/2014-gulfwide-emission-inventory
Fugitives	lbs/hr/component						0.0005				API Study	12/93	https://www.api.org/
Glycol Dehydrator	tons/yr/dehydrator						19.240				2011 Gulfwide Inventory; Avg emiss (upper bound of 95% CI)	2014	https://www.boem.gov/environment/environmental-studies/2011-gulfwide-emission-inventory
Cold Vent	tons/yr/vent						44.747				2014 Gulfwide Inventory; Avg emiss (upper bound of 95% CI)	2017	https://www.boem.gov/environment/environmental-studies/2014-gulfwide-emission-inventory
Waste Incinerator	lb/ton		15.0	15.0	2.5	2.0	N/A	N/A	20.0	N/A	AP 42 2.1-12	10/96	https://www3.epa.gov/ttnchie1/ap42/ch02/final/c02s01.pdf
On-Ice – Loader	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	https://www.epa.gov/moves/nonroad2008a-installation-and-updates
On-Ice – Other Construction Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-Ice – Other Survey Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-Ice – Tractor	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-Ice – Truck (for gravel island)	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-Ice – Truck (for surveys)	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
Man Camp - Operation (max people/day)	tons/person/day		0.0004	0.0004	0.0004	0.006	0.001	N/A	0.001	N/A	BOEM 2014-1001	2014	https://www.boem.gov/sites/default/files/uploadedFiles/BOEM/BOEM_Newsroom/Library/Publications/2014-1001.pdf
Vessels - Ice Management Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Vessels - Hovercraft Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data

Sulfur Content Source	Value	Units
Fuel Gas	3.38	ppm
Diesel Fuel	0.0015	% weight
Produced Gas (Flare)	3.38	ppm
Produced Oil (Liquid Flaring)	1	% weight

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

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

Natural Gas Flare Parameters	Value	Units
VOC Content of Flare Gas	0.6816	lb VOC/lb-mol gas
Natural Gas Flare Efficiency	98	%

AIR EMISSIONS CALCULATIONS - 1ST - 12TH YEAR

COMPANY	AREA		BLOCK	LEASE	FACILITY	WELL					CONTACT		PHONE		REMARKS										
Anadarko Petroleum Corporation	Green Canyon		679	OCS-G 21811	N/A	GC 679 W,WW,WWW,X,XX,XXX,Y,YY,YYY,Z,ZZ,ZZZ					Teri Powell		832-636-1261		Drill and complete 12 new wells with surface locations in GC 679 (200 days each; 2,400 total). The approved air emissions for the Constitution facility currently reflect max throughput volumes,										
OPERATIONS	EQUIPMENT	EQUIPMENT ID	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	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
DRILLING	VESSELS- Drilling - Propulsion Engine - Diesel		60354	3104.971888	74519.33	24	200	42.58	25.69	24.92	0.62	1020.15	29.33	0.00	160.01	0.30	102.19	61.65	59.80	1.49	2448.35	70.40	0.01	384.02	0.71
	VESSELS- Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS- Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS- Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Vessels - Diesel Boiler		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Vessels – Drilling Prime Engine, Auxiliary		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	VESSELS - Heavy Lift Vessel/Derrick Barge Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			BPD																						
DRILLING	Liquid Flaring		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	COMBUSTION FLARE - no smoke			0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - light smoke			416,666		24	2	0.87	0.87	0.87	0.24	29.75	14.97	--	135.62	--	0.02	0.02	0.02	0.01	0.71	0.36	--	3.25	--
	COMBUSTION FLARE - medium smoke			0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - heavy smoke			0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
ALASKA-SPECIFIC SOURCES	**VESSELS**		kW			HR/D	D/YR																		
	VESSELS - Ice Management Diesel		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
2027-2038	**Facility Total Emissions**							**43.45**	**26.56**	**25.79**	**0.86**	**1,049.90**	**44.30**	**0.00**	**295.63**	**0.30**	**102.21**	**61.67**	**59.82**	**1.49**	**2,449.06**	**70.75**	**0.01**	**387.27**	**0.71**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**																**3,962.70**			**3,962.70**	**3,962.70**	**3,962.70**		**82,257.76**	
	119.0																								
DRILLING	VESSELS- Crew Diesel		10551	542.8067468	13027.36	24	86	7.44	4.49	4.36	0.11	178.34	5.13	0.00	27.97	0.05	7.66	4.62	4.48	0.11	183.44	5.27	0.00	28.77	0.05
	VESSELS - Supply Diesel		12363	636.0268989	15264.65	24	57	8.72	5.26	5.10	0.13	208.97	6.01	0.00	32.78	0.06	5.98	3.61	3.50	0.09	143.29	4.12	0.00	22.48	0.04
	VESSELS - Tugs Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY	VESSELS - Material Tug Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
INSTALLATION	VESSELS - Crew Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Supply Diesel		27493	1414.40488	33945.72	24	3	19.40	11.70	11.35	0.28	464.71	13.36	0.00	72.89	0.14	0.70	0.42	0.41	0.01	16.73	0.48	0.00	2.62	0.00
PRODUCTION	VESSELS - Support Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ALASKA-SPECIFIC SOURCES	**On-Ice Equipment**			**GAL/HR**	**GAL/D**																				
	Man Camp - Operation (maximum people per day)		**PEOPLE/DAY**																						
	VESSELS		**kW**			**HR/D**	**D/YR**																		
	On-Ice – Loader			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Other Construction Equipment			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Other Survey Equipment			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Tractor			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Truck (for gravel island)			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Truck (for surveys)			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	Man Camp - Operation		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	
	VESSELS - Hovercraft Diesel		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2027-2038	**Non-Facility Total Emissions**							**35.56**	**21.45**	**20.81**	**0.52**	**852.01**	**24.50**	**0.00**	**133.64**	**0.25**	**14.34**	**8.65**	**8.39**	**0.21**	**343.46**	**9.88**	**0.00**	**53.87**	**0.10**

AIR EMISSIONS CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	
Anadarko Petroleum Corporation	679	OCS-G 21811	N/A	GC 679 W,WW,WWW,X,XX,XXX,Y,YY,YYY,Z,ZZ,ZZZ		

Year	Facility Emitted Substance								
	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
2027-2038	102.21	61.67	59.82	1.49	2449.06	70.75	0.01	387.27	0.71
Allowable	3962.70			3962.70	3962.70	3962.70		82257.76	

COMPANY	Anadarko Petroleum Corporation
AREA	Green Canyon
BLOCK	680
LEASE	OCS-G 22987
FACILITY	N/A
WELL	**GC 680** U,UU,UUU,V,VV,VVV **GC 679** V, VV ***(SHL in GC 680)***
COMPANY CONTACT	Teri Powell
TELEPHONE NO.	832-636-1261
REMARKS	Drill and complete 8 new wells with surface locations in GC 680 (200 days each; 1600 total). Previously approved activities (Plan Control No. N-10245) are being brought forward under this plan as noted below. The approved air emissions for the Constitution facility currently reflect max throughput volumes, therefore these drilling/completion activities will not change the facilities previously approved emissions.

PLAN - NEW Proposed Activity		Proposed Vessel Type	Estimated Start Date	Estimated End Date	Max. Anticipated No. of Days
Surface Location GC 680					
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 V		MODU	4/1/2038	10/18/2038	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 U		MODU	1/1/2039	7/20/2039	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 V		MODU	2/1/2040	8/19/2040	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 679 VV		MODU	3/1/2041	9/17/2041	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 UU		MODU	4/1/2042	10/18/2042	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 VV		MODU	1/1/2043	7/20/2043	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 UUU		MODU	2/1/2044	8/19/2044	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 VVV		MODU	3/1/2045	9/17/2045	200 days

Previously Approved Locations with AQR's Being Brought Forward	Plan Control No.	Proposed Vessel Type	Estimated Start Date	Estimated End Date	Max. Anticipated No. of Days
Surface Location GC 680					
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 W	N-10245	MODU	1/1/2027	7/20/2027	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 X	N-10245	MODU	2/1/2028	8/19/2028	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 Z	N-10245	MODU	3/1/2029	9/17/2029	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 YY	N-10245	MODU	4/1/2030	10/18/2030	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 WW	N-10245	MODU	1/1/2031	7/20/2031	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 XX	N-10245	MODU	2/1/2032	8/19/2032	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 ZZ	N-10245	MODU	3/1/2033	9/17/2033	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 YYY	N-10245	MODU	4/1/2034	10/18/2034	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 WWW	N-10245	MODU	1/1/2035	7/20/2035	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 XXX	N-10245	MODU	2/1/2036	8/19/2036	200 days
Drill, Complete/Install Subsea Wellhead/Tree & Conduct Flowtest Well Location GC 680 ZZZ	N-10245	MODU	3/1/2037	9/17/2037	200 days

** The Activity Schedule is denoted for optionaility, start date may change in the future.*
Not all locations may be drilled in a year and denoted for air emission coverage.

AIR EMISSIONS COMPUTATION FACTORS

Fuel Usage Conversion Factors	Natural Gas Turbines				Natural Gas Engines		Diesel Recip. Engine		Diesel Turbines			
	SCF/hp-hr	9.524			SCF/hp-hr	7.143	GAL/hp-hr	0.0514	GAL/hp-hr	0.0514		

Equipment/Emission Factors	units	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	REF.	DATE	Reference Links
Natural Gas Turbine	g/hp-hr		0.0086	0.0086	0.0026	1.4515	0.0095	N/A	0.3719	N/A	AP42 3.1-1& 3.1-2a	4/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s01.pdf
RECIP. 2 Cycle Lean Natural Gas	g/hp-hr		0.1293	0.1293	0.0020	6.5998	200.0000	N/A	1.2009	N/A	AP42 3.2-1	7/00	https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s02.pdf
RECIP. 4 Cycle Lean Natural Gas	g/hp-hr		0.0002	0.0002	0.0020	2.8814	0.4014	N/A	1.8949	N/A	AP42 3.2-2	7/00	https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s02.pdf
RECIP. 4 Cycle Rich Natural Gas	g/hp-hr		0.0323	0.0323	0.0020	7.7224	0.1021	N/A	11.9408	N/A	AP42 3.2-3	7/00	https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s02.pdf
Diesel Recip. < 600 hp	g/hp-hr	1	1	1	0.0279	14.1	1.04	N/A	3.03	N/A	AP42 3.3-1	10/96	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s03.pdf
Diesel Recip. > 600 hp	g/hp-hr	0.32	0.182	0.178	0.0055	10.9	0.29	N/A	2.5	N/A	AP42 3.4-1 & 3.4-2	10/96	https://www3.epa.gov/ttn/chief/ap42/ch03/final/c03s04.pdf
Diesel Boiler	lbs/bbl	0.0840	0.0420	0.0105	0.0089	1.0080	0.0084	5.14E-05	0.2100	0.0336	AP42 1.3-6; Pb and NH3: WebFIRE (08/2018)	9/98 and 5/10	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s03.pdf https://cfpub.epa.gov/webfire/
Diesel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0013	4.45E-05	0.0105	N/A	AP42 3.1-1 & 3.1-2a	4/00	https://www3.epa.gov/ttnchie1/ap42/ch03/final/c03s01.pdf
Dual Fuel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0095	4.45E-05	0.3719	0.0000	AP42 3.1-1& 3.1-2a; AP42 3.1-1 & 3.1-2a	4/00	https://cfpub.epa.gov/webfire/
Vessels – Propulsion	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Vessels – Drilling Prime Engine, Auxiliary	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	
Vessels – Diesel Boiler	g/hp-hr	0.0466	0.1491	0.1417	0.4400	1.4914	0.0820	3.73E-05	0.1491	0.0003	USEPA 2017 NEI;TSP (units converted) refer to Diesel Boiler Reference	3/19	
Vessels – Well Stimulation	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	
Natural Gas Heater/Boiler/Burner	lbs/MMscf	7.60	1.90	1.90	0.60	190.00	5.50	5.00E-04	84.00	3.2	AP42 1.4-1 & 1.4-2; Pb and NH3: WebFIRE (08/2018)	7/98 and 8/18	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s04.pdf https://cfpub.epa.gov/webfire/
Combustion Flare (no smoke)	lbs/MMscf	0.00	0.00	0.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	https://www3.epa.gov/ttn/chief/ap42/ch13/final/C13S05_02-05-18.pdf
Combustion Flare (light smoke)	lbs/MMscf	2.10	2.10	2.10	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (medium smoke)	lbs/MMscf	10.50	10.50	10.50	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Combustion Flare (heavy smoke)	lbs/MMscf	21.00	21.00	21.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	2/18	
Liquid Flaring	lbs/bbl	0.42	0.0966	0.0651	5.964	0.84	0.01428	5.14E-05	0.21	0.0336	AP42 1.3-1 through 1.3-3 and 1.3-5	5/10	https://www3.epa.gov/ttnchie1/ap42/ch01/final/c01s03.pdf
Storage Tank	tons/yr/tank						4.300				2014 Gulfwide Inventory; Avg emiss (upper bound of 95% CI)	2017	https://www.boem.gov/environment/environmental-studies/2014-gulfwide-emission-inventory
Fugitives	lbs/hr/component						0.0005				API Study	12/93	https://www.api.org/
Glycol Dehydrator	tons/yr/dehydrator						19.240				2011 Gulfwide Inventory; Avg emiss (upper bound of 95% CI)	2014	https://www.boem.gov/environment/environmental-studies/2011-gulfwide-emission-inventory
Cold Vent	tons/yr/vent						44.747				2014 Gulfwide Inventory; Avg emiss (upper bound of 95% CI)	2017	https://www.boem.gov/environment/environmental-studies/2014-gulfwide-emission-inventory
Waste Incinerator	lb/ton		15.0	15.0	2.5	2.0	N/A	N/A	20.0	N/A	AP 42 2.1-12	10/96	https://www3.epa.gov/ttnchie1/ap42/ch02/final/c02s01.pdf
On-Ice – Loader	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	https://www.epa.gov/moves/nonroad2008a-installation-and-updates
On-Ice – Other Construction Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-Ice – Other Survey Equipment	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-Ice – Tractor	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-Ice – Truck (for gravel island)	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-Ice – Truck (for surveys)	lbs/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model; TSP (units converted) refer to Diesel Recip. <600 reference	2009	
Man Camp - Operation (max people/day)	tons/person/day		0.0004	0.0004	0.0004	0.006	0.001	N/A	0.001	N/A	BOEM 2014-1001	2014	https://www.boem.gov/sites/default/files/uploadedFiles/BOEM/BOEM_Newsroom/Library/Publications/2014-1001.pdf
Vessels - Ice Management Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Vessels - Hovercraft Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI;TSP refer to Diesel Recip. > 600 hp reference	3/19	https://www.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data

Sulfur Content Source	Value	Units
Fuel Gas	3.38	ppm
Diesel Fuel	0.0015	% weight
Produced Gas (Flare)	3.38	ppm
Produced Oil (Liquid Flaring)	1	% weight

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

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

Natural Gas Flare Parameters	Value	Units
VOC Content of Flare Gas	0.6816	lb VOC/lb-mol gas
Natural Gas Flare Efficiency	98	%

AIR EMISSIONS CALCULATIONS - 1ST - 19TH YEAR

COMPANY	AREA		BLOCK	LEASE	FACILITY	WELL					CONTACT		PHONE		REMARKS										
Anadarko Petroleum Corporation	Green Canyon		680	OCS-G 22987	N/A	GC 680 U,UU,UUU,V,VV,VVVGC 679 V, VV (SHL in GC 680)					Teri Powell		832-636-1261		Drill and complete 8 new wells with surface locations in GC 680 (200 days each; 1600 total). Previously approved activities (Plan Control No. N-10245) are being brought forward under this pla										
OPERATIONS	**EQUIPMENT**	**EQUIPMENT ID**	**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**	**TSP**	**PM10**	**PM2.5**	**SOx**	**NOx**	**VOC**	**Pb**	**CO**	**NH3**	**TSP**	**PM10**	**PM2.5**	**SOx**	**NOx**	**VOC**	**Pb**	**CO**	**NH3**
DRILLING	VESSELS- Drilling - Propulsion Engine - Diesel		60354	3104.971888	74519.33	24	200	42.58	25.69	24.92	0.62	1020.15	29.33	0.00	160.01	0.30	102.19	61.65	59.80	1.49	2448.35	70.40	0.01	384.02	0.71
	VESSELS- Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS- Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS- Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Vessels - Diesel Boiler		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Vessels – Drilling Prime Engine, Auxiliary		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY INSTALLATION	VESSELS - Heavy Lift Vessel/Derrick Barge Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
			BPD																						
DRILLING	Liquid Flaring		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WELL TEST	COMBUSTION FLARE - no smoke			0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - light smoke			416,666		24	2	0.87	0.87	0.87	0.24	29.75	14.97	--	135.62	--	0.02	0.02	0.02	0.01	0.71	0.36	--	3.25	--
	COMBUSTION FLARE - medium smoke			0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
	COMBUSTION FLARE - heavy smoke			0		0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--
ALASKA-SPECIFIC SOURCES	**VESSELS**		**kW**			**HR/D**	**D/YR**																		
	VESSELS - Ice Management Diesel		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
2027-2045	**Facility Total Emissions**							**43.45**	**26.56**	**25.79**	**0.86**	**1,049.90**	**44.30**	**0.00**	**295.63**	**0.30**	**102.21**	**61.67**	**59.82**	**1.49**	**2,449.06**	**70.75**	**0.01**	**387.27**	**0.71**
EXEMPTION CALCULATION	**DISTANCE FROM LAND IN MILES**																**3,962.70**			**3,962.70**	**3,962.70**	**3,962.70**		**82,257.76**	
	119.0																								
DRILLING	VESSELS- Crew Diesel		10551	542.8067468	13027.36	24	86	7.44	4.49	4.36	0.11	178.34	5.13	0.00	27.97	0.05	7.66	4.62	4.48	0.11	183.44	5.27	0.00	28.77	0.05
	VESSELS - Supply Diesel		12363	636.0268989	15264.65	24	57	8.72	5.26	5.10	0.13	208.97	6.01	0.00	32.78	0.06	5.98	3.61	3.50	0.09	143.29	4.12	0.00	22.48	0.04
	VESSELS - Tugs Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FACILITY	VESSELS - Material Tug Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
INSTALLATION	VESSELS - Crew Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Supply Diesel		27493	1414.40488	33945.72	24	3	19.40	11.70	11.35	0.28	464.71	13.36	0.00	72.89	0.14	0.70	0.42	0.41	0.01	16.73	0.48	0.00	2.62	0.00
PRODUCTION	VESSELS - Support Diesel		0	0	0.00	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ALASKA-SPECIFIC SOURCES	**On-Ice Equipment**			**GAL/HR**	**GAL/D**																				
	Man Camp - Operation (maximum people per day)		**PEOPLE/DAY**																						
	VESSELS		**kW**			**HR/D**	**D/YR**																		
	On-Ice – Loader			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Other Construction Equipment			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Other Survey Equipment			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Tractor			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Truck (for gravel island)			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	On-Ice – Truck (for surveys)			0	0.0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	0.00
	Man Camp - Operation		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	--	0.00	
	VESSELS - Hovercraft Diesel		0			0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2027-2045	**Non-Facility Total Emissions**							**35.56**	**21.45**	**20.81**	**0.52**	**852.01**	**24.50**	**0.00**	**133.64**	**0.25**	**14.34**	**8.65**	**8.39**	**0.21**	**343.46**	**9.88**	**0.00**	**53.87**	**0.10**

AIR EMISSIONS CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	
Anadarko Petroleum Corporation	680	OCS-G 22987	N/A	GC 680 U,UU,UUU,V,VV,VVVGC 679 V, VV (SHL in GC 680)		

Year	Facility Emitted Substance								
	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
2027-2045	102.21	61.67	59.82	1.49	2449.06	70.75	0.01	387.27	0.71
Allowable	3962.70			3962.70	3962.70	3962.70		82257.76	

SECTION H
OIL SPILL INFORMATION

(a) Oil Spill Response Planning

(i) OSRP Information

All the proposed activities and facilities in this Supplemental EP are covered by the Regional Oil Spill Response Plan (OSRP) approved in August 2015 for Anadarko Petroleum Corporation and its subsidiary Anadarko US Offshore LLC. (Company Numbers 00981 and 02219 respectively) in accordance with 30 CFR Part 254. The latest OSRP biennial update was submitted on June 30, 2025, and in compliance with 30 CFR 254.30(a) as of October 14, 2025.

(ii) Spill Response Sites

Primary Response Equipment Location(s)	Preplanned Staging Location(s)
Houma, Louisiana	Fourchon, Louisiana
Harvey, Louisiana	Harvey, Louisiana
Venice, Louisiana	Venice, Louisiana
Lake Charles, Louisiana	Cameron, Louisiana
Galveston, Texas	Galveston, Texas

(iii) OSRO Information

Anadarko maintains a contract with Clean Gulf Associates (CGA) for spill response equipment. Various equipment locations are staged throughout the Gulf of Mexico. CGA equipment can be referenced on their website: http://www.cleangulfassoc.com/. Personnel would be obtained from the Marine Spill Response Corporation's (MSRC) STARS network, including a supervisor to operate the equipment.

In addition, Anadarko has a contract with the Marine Spill Response Corporation (MSRC) for spill response equipment. MSRC stages equipment throughout the Gulf of Mexico and has recently completed a large expansion of its resources, with particular focus on deepwater. The expansion is known as "Deep Blue". MSRC capabilities and a complete equipment listing are available on-line at: http://www.msrc.org/.

Anadarko is also a member of the Marine Well Containment Company (MWCC), which provides access to containment response capabilities and includes subsea dispersant injection equipment.

(iv) Worst-Case Scenario Determination

Category	Regional OSRP (S-7623)	Initial EP (N-10245)	Supplemental EP
Type of Activity	Exploratory	Exploratory	Exploratory
Facility Location (area/block)	GC 683	GC 680	GC 679
Facility Designation	GC 683 G*	GC 680 Y	GC 679 V
Distance to Nearest Shoreline	120 miles	119 miles	119 miles
Storage Tanks (total)	N/A	N/A	N/A
Flowlines (on facility)	N/A	N/A	N/A
Pipelines	N/A	N/A	N/A
Uncontrolled Blowout	403,608 bopd*	321,368 bopd**	226,660 bopd
Type of Oil(s)	Oil	Oil	Oil
API Gravity	28.9°	26.8°	29.6°

**As approved under Plan Control No.: S-7623.*
*** Overall highest WCD for the plan area–GC 679, 680.*

Anadarko has determined that the worst-case scenario from the activities proposed in this Supplemental EP does not supersede the worst-case scenario for Green Canyon 683.

Since Anadarko has the capability to respond to the worst-case spill scenario included in our Regional OSRP, and since the worst-case scenarios determined for the Supplemental EP does not replace the worst-case scenario in the Regional OSRP approved in August 2015, and the June 2025 biennial update acknowledged as in-compliance in October 2025, I hereby certify that Anadarko 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 Supplemental EP.

(b) Worst-Case Discharge Volume Assumptions

Worst-case discharge (WCD) calculations and assumptions within this section utilized guidelines and requirements pursuant with NTL No. 2015-N01. Discussions regarding geologic information are considered proprietary and have been omitted from this public copy of the Supplemental EP.

(c) Oil Spill Response Discussion

For the purpose of NEPA analysis, the largest spill volume originating from the proposed activity would be an uncontrolled blowout of the well during drilling operations at 321,368 bopd with an API gravity of 26.8°. A discussion of the blowout scenario is included in accordance with NTL No. 2015-N01.

Land Segment and Resource Identification Modeling

Trajectory of a spill and the probability of its impacting a land segment have been projected utilizing information in the Oil Spill Risk Analysis Model (OSRAM) for the Central Gulf of Mexico. Additional information may be referenced in the "Oil-Spill Risk Analysis: Contingency Planning Statistics for Gulf of Mexico OCS Activities" (OCS Report MMS 2004-026), using the average conditional probability for 3, 10, and 30 day impacts.

GC 679 and 680 are located within Launch Area 45. According to the BOEM OSRAM, the trajectory indicates a 4% probability of potential impact to the shoreline in Cameron Parish, Louisiana within 30 days. The results are shown in **Table H-2.**

Cameron Parish is identified as the most probable potential impacted parish or county within the Gulf of Mexico for this operation. This region is an extremely sensitive habitat and serves as a migratory, breeding, feeding and nursery habitat for numerous species of wildlife. Beaches in this area vary in grain particle size and can be classified as fine sand, shell or perched shell beaches. Sandy and muddy tidal flats are also abundant.

Response

Anadarko will make every effort to respond to the worst-case discharge as effectively as possible. Response equipment available to respond to the worst-case discharge and the estimated time of a spill response from oil spill detection to equipment deployment on-site is included in **Table H-3.** The table estimates individual times needed for procurement, load out, travel time to the site and deployment. In the event of an actual incident equipment and times can vary.

For the purpose of response scenario discussion, an uncontrolled blowout of the well would be considered the largest potential spill volume at 321,368 bopd. An ADIOS weathering model was run based on a similar type of oil expected to be produced from this well. Based on this information, approximately 13% (41,778 bbls) of the initial volume would be evaporated/ dispersed within 24 hours.

If approved and appropriate, 4 sorties (8,000 gallons) from the Basler aircraft and 8 sorties (9,600 gallons) from two DC-3 aircrafts could disperse approximately 7,540 barrels of oil.

If the conditions are appropriate, and the necessary approvals and permits have been obtained, in-situ burning may be utilized. Based on in-situ burn operations during Deepwater Horizon, approximately 5% (16,068 bbls) of the total initial worst case discharge could be burned.

Although unlikely in a spill lasting thirty (30) days, potential shoreline impact in Cameron Parish, Louisiana could occur depending on environmental conditions (wind, currents and temperature) at the time of an incident. Nearshore response may include the use of shoreline boom on beach areas, or protection/sorbent boom on vegetated areas. Surveillance and real time trajectories would aide in determining the most appropriate strategies to respond to a spill.

Table H.3 provides an example of offshore and nearshore equipment, response times, and personnel to respond to a spill of 279,590 bbls, which is the estimated amount that would remain considering natural evaporation/dispersion at 24 hours. This amount could be further reduced through the application of aerial and subsea dispersants, and in-situ burning provided such applications/actions were approved.

Anadarko's contingency plan for dealing with this worst-case discharge would be to activate its Spill Management Team and equipment resources as described in its Gulf of Mexico Regional Oil Spill Response Plan (OSRP) and provide continuous support for the duration of the event. Response resources are activated and supplemented according to need. These resources would remain engaged in the response until the incident is deemed complete or until released by Unified Command.

Anadarko is also a member of the Marine Well Containment Company (MWCC), which provides access to containment response capabilities and includes subsea dispersant injection equipment.

In the event of a blowout, Anadarko may:

1. Evacuate personnel, if necessary. Deploy emergency responders in an effort to preserve human life, if necessary.

2. Assess the damage and attempt to stop the flow at the source, if safe to do so, to reduce the amount of oil discharged.

3. Notify agencies.

4. Assess the amount of oil that has been spilled and calculate additional potential of oil flow. A continuous aerial surveillance program would be used to assess the growth of the slick and the volume of oil on the water. Observations of the size of the slick on the water, combined with observations at the source, would be used to provide a constant update. Additional potential to release fuel from the remaining tanks onboard the dynamically positioned (DP) semi-submersible drilling rig would be determined by marine surveyors. Operations and Unified Command would continue to assess the adequacy of response equipment capacities based on this continually updated mass balance.

5. Convene the Incident Management Team (IMT). Organize Unified Command and establish objectives and priorities.

6. Monitor the oil spill with aerial surveillance and obtain trajectories. If oil is seaward bound, going away from land, discuss additional strategies with Unified Command.

7. If oil is moving in the direction of a shoreline and weather conditions are favorable, request approval to utilize dispersants.

a. Prior to commencing application operations, conduct an on-site survey in consultation with natural resource specialists to determine if any threatened or endangered species are present in the projected application area or otherwise at risk from dispersant application.

b. Upon approval, mobilize one Basler aircraft and two DC-3 aircrafts from Houma, with surveillance aircraft and spotter. Mobilize MSRC contracted aircraft(s) if needed. Rotate aircraft, spraying the leading edge of the spill and working back to the source. Monitor/sample for effectiveness (USCG SMART Team). Truck additional dispersants from CGA/MSRC stockpile to Houma, if necessary.

c. Dispersants are most effective when applied as soon after discharge as possible, since weathering of the oil decreases dispersant effectiveness. The estimated window of opportunity for most effective use of dispersants is within 48-72 hours post-release. The oil may still be dispersible after 72 hours on the water surface, but the effectiveness of dispersant use would likely be diminished after the oil has been on the water for more than three days. Ultimately, the USCG SMART monitoring protocol will be used to determine whether or not dispersant operations are effective.

d. Once the CGA HOSS barge is on location and in the skimming mode, dispersants would only be used if required and approved.

8. Deploy offshore mechanical oil containment and recovery equipment. Attempt to recover as much oil at sea as possible, utilizing:

a. The CGA HOSS barge, will be positioned in a stationary mode, will be situated down-wind and down-current from location for long-duration, high-volume skimming. Based on average travel times, the HOSS barge could be on location within approximately 46.9 hours of the release. The de-rated skimming capacity of the HOSS barge is 76,285 bbls per day. However, only the oil encountered by a skimmer can be recovered. In order to maximize oil encounter rate, boom will be deployed in a V-configuration in front of the HOSS barge to funnel oil to the skimmers. If necessary, temporary barges can be activated to support continuous skimming operations. (These barges arrive on-site at approximately the same time as the HOSS barge.) For an on-going release, multiple barges are deployed to provide for continuous off-loading of skimmer storage vessels and shuttling of recovered oil to an onshore waste handling facility. Sufficient barges are available to provide enough temporary storage for continuous recovery operations.

b. CGA's Fast Response Vessels (FRV) would arrive on-scene between approximately 11.5-18.5 hours of the initial release. These skimmers operate downstream of the HOSS barge and are used to recover pockets and streamers of oil that may move past the large stationary skimmer. Each FRV has 249 barrels of on-board storage. Approval will be requested to decant water after gravity separation, through a hose forward of the skimmer, to optimize temporary storage capacity. A 42" Boom will be utilized to concentrate oil so that it is thick enough to be skimmed.

9. Dispersants, Fast Response Vessels (FRV), Oil Spill Response Vessels (OSRV or R/V) would typically work daylight hours only. The HOSS barge can operate continuously, including night operations. Available technology will be considered such as remote sensing devices that will enable 24 hour surveillance, trajectories, and planning. All response vessels are designed to be able to remain offshore continuously throughout the response. Even if sea conditions prohibit effective skimming, these resources would remain offshore until skimming operations could be commenced again. Safety would remain the first priority.

10. Prepare Site-Specific Waste Management Plan, Site Safety Plan, Decontamination Plans, Communications and Medical Plans.

11. If oil becomes a threat to any shoreline, data from the aerial surveillance, weather reports, and trajectories would be used to direct onshore teams to deploy protection/containment boom with reference to Area Contingency Plans and in coordination with State and Federal On-Scene Coordinators.

    a. Implement pre-designated strategies.

    b. Identify resources at risk in spill vicinity.

    c. Develop/implement appropriate protection tactics.

12. Establish Site-Specific Wildlife Rescue and Rehabilitation Plan.

The following types of additional support may be required for a blowout lasting 120 days.

- Additional Oil Spill Removal Organization (OSRO) personnel to relieve equipment operators
- Vessels for supporting offshore operations
- Field safety personnel
- Continued surveillance and monitoring of oil movement
- Helicopter, video cameras
- Infra-red (nighttime spill tracking) capabilities, X-band radar
- Barge to transport recovered oil from offshore skimming system, and temporary storage barges to onshore disposal sites that are identified in Area Contingency Plans (ACP)
- Logistics needed to support equipment:
    - Staging areas
    - Parts, trailers, and mechanics to maintain skimmers and boom
    - Fueling facilities
    - Decontamination stations
    - Dispersant stockpile transported from Houston to Houma or other potential command post locations
    - Communications equipment and technicians

- Logistics needed to support responder personnel
  - Medical aid stations
  - Safety personnel
  - Food
  - Berthing
  - Additional clothing/safety supplies
  - Decontamination stations

Louisiana CZM Containment Response Information

Anadarko has the capability to respond and contain, to the maximum extent practicable as defined in 30 CFR 254.6 and 30 CFR 250.26(d)(1), to the estimated worst case discharge (WCD) associated with the proposed activity within 30 days. Deployment time for surface containment equipment is subject to availability and location, weather conditions, potential security zones around the spill site, and site/well specific assessment data. Personnel safety is always first and foremost. Refer to further details on equipment and timing provided in **Section H–Oil Spill Information** and **Table H-3** of this Supplemental EP.

The potential WCD will be further evaluated during the Application for Permit to Drill (APD) process, including the Well Containment Screening Tool (WCST) and associated subsea containment plan for enhanced planning purposes.

There will be no new or unusual technology deployed that has not been previously deployed for Gulf of Mexico oil spill prevention, control, and/or cleanup.

Table H-1

Worst Case Discharge Calculation
(Based on Blowout during Drilling Operations)

Calculations for Uncontrolled Blowout> 10 miles from shore:		**Block 680**
i.	Type of Oil (crude, condensate, diesel)	Crude
ii.	API Gravity	26.8
iii.	EP Location Used for NTL No. 2015-N01 WCD	GC 680 Y
iv.	Largest Anticipated WCD Rate during blowout	321,368 bopd*
v.	**WCD Total for Drilling Operations for GC 680 Y > 10 miles from shore:**	321,368 bopd*

**Overall highest WCD for the GC 679, 680 plan area.*

Table H-2

Trajectory by Land Segment

Following are the average conditional probabilities (expressed as percent chance) that an oil spill starting at a particular launch area will contact a land segment as included in the BOEM Oil Spill Risk Analysis Model (OSRAM) for the Central and Western Gulf of Mexico. This information can be found on the BOEM website using 3/10/30 day potential impact, as applicable. The results are listed below.

Area/Block	OCS-G	Launch Area	Land Segment and/or Resource	Conditional Probability (%)		
				3 days	10 days	30 days
GC 679, 680 Drill, complete, test, and install subsea tree (119 miles from shore)	G21811 G22987	C45 Central Planning Area	Calhoun County, TX	--	--	1
			Matagorda County, TX	--	--	1
			Brazoria County, TX	--	--	1
			Galveston County, TX	--	--	2
			Jefferson County, TX	--	--	1
			Cameron Parish, LA	--	--	**4**
			Vermilion Parish, LA	--	--	2
			Iberia Parish, LA	--	--	1
			Terrebonne Parish, LA	--	--	2
			Lafourche Parish, LA	--	--	1
			Plaquemines, LA	--	--	2

Table H-3

WCD Scenario Drilling Activities – Based on a single well uncontrolled blowout (119 miles from shore)
GC 680 Y
321,368 BOPD (initial volume)
279,590 BOPD (after evaporation/dispersion)
API Gravity 26.8°

Offshore Equipment from Spill Detection to Equipment Deployment Response Time: GC 680 Y

Dispersants/Surveillance

Dispersant/Surveillance	Dispersant Capacity (gal)	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to site	Total Hrs
ASI							
Basler 67T	2000	2	Houma	2	2	0.8	4.8
DC 3	1200	2	Houma	2	2	1.1	5.1
DC 3	1200	2	Houma	2	2	1.1	5.1
Aero Commander	NA	2	Houma	2	2	0.8	4.8
MSRC							
C-130 Spray AC	3,250	2	Melbourne, FL	4	0	1.9	5.9

Offshore Response

Offshore Equipment Pre-determined Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
CGA											
HOSS Barge	76285	4000	3 Tugs	12	Harvey	6	0	12	26.9	2	46.9
95' FRV	22885	249	NA	6	Venice	2	0	3	7.5	1	13.5
95' FRV	22885	249	NA	6	Leeville	2	0	2	6.5	1	11.5
95' FRV	22885	249	NA	6	Galveston	2	0	2	13.5	1	18.5
95' FRV	22885	249	NA	6	Vermilion	2	0	3	9.3	1	15.3
Boom Barge (CGA-3000 42" Auto Boom (25000')	NA	NA	1 Tug 50 Crew	4 (Barge) 2 (Per Crew)	Leeville	8	0	4	18.5	2	32.5
Kirby Offshore (available through contract with CGA)											
RO Barge	NA	80000+	1 Tug	6	Venice	34	0	6	19	1	60
RO Barge	NA	80000+	1 Tug	6	Venice	34	0	6	17.5	1	60
RO Barge	NA	100000+	1 Tug	6	Venice	34	0	6	17.5	1	60
RO Barge	NA	100000+	1 Tug	6	Venice	34	0	6	17.5	1	60
RO Barge	NA	100000+	1 Tug	6	Venice	34	0	6	17.5	1	60
RO Barge	NA	110000+	1 Tug	6	Venice	34	0	6	17.5	1	60
RO Barge	NA	130000+	1 Tug	6	Venice	34	0	6	17.5	1	60
RO Barge	NA	140000+	1 Tug	6	Venice	34	0	6	17.5	1	60
RO Barge	NA	150000+	1 Tug	6	Venice	34	0	6	17.5	1	60
RO Barge	NA	160000+	1 Tug	6	Venice	34	0	6	17.5	1	60

Offshore Response

Offshore Equipment No Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
MSRC											
Louisiana Responder Transrec 350 + OSRV *2,640' 67" Curtain Pressure Boom*	10567	4000	1-2 Support Vessels	10	Fort Jackson	2	0	4	10	1	17
MSRC 401 Offshore Barge 1 Crucial Disk 88/30 *2,640' 67" Curtain Pressure Boom*	11122	45000	3 Tugs + 1-2 Support Vessels	9	Fort Jackson	4	0	6	18	1	29
Mississippi Responder Transrec 350 + OSRV *2,640' 67" Curtain Pressure Boom*	10567	4000	1-2 Support Vessels	10	Pascagoula	2	0	2	19	1	25
MSRC 402 Offshore Barge 1 Crucial Disk 88/30 *2,640' 67" Curtain Pressure Boom*	11122	40300	3 Tugs + 1-2 Support Vessels	9	Pascagoula	4	0	3	34	1	42
S.T. Benz Responder 1 LFF 100 Brush *2,640' 67" Curtain Pressure Boom*	18086	4000	1-2 Support Vessels	10	Grand Isle	3	0	1	10.5	1	14.5
Gulf Coast Responder Transrec 350 + OSRV *2,640' 67" Curtain Pressure Boom*	10567	4000	1-2 Support Vessels	10	Lake Charles	2	0	4	16	1	23
Texas Responder Transrec 350 + OSRV *2,640' 67" Curtain Pressure Boom*	10567	4000	1-2 Support Vessels	10	Galveston	2	0	1	19	1	23
MSRC 570 Offshore Barge 1 Crucial Disk 88/30 *2,640' 67" Curtain Pressure Boom*	11122	56900	3 Tugs + 1-2 Support Vessels	9	Galveston	4	0	2	34	1	41
Southern Responder Transrec 350 + OSRV *2,640' 67" Curtain Pressure Boom*	10567	4000	1-2 Support Vessels	10	Ingleside	2	0	2	27	1	32
MSRC 403 Offshore Barge 1 Crucial Disk 88/30 *2,640' 67" Curtain Pressure Boom*	11122	40300	3 Tugs + 1-2 Support Vessels	9	Ingleside	4	0	3	47	1	55
MSRC 360 Offshore Barge 1 Crucial Disk 88/30 *1,320' 67" Curtain Pressure Boom*	11122	36000	3 Tugs + 1-2 Support Vessels	9	Tampa	4	0	3	63	1	71
Florida Responder Transrec 350 + OSRV *2,640' 67" Curtain Pressure Boom*	10567	4000	1-2 Support Vessels	10	Miami	2	0	1	54	1	58

Staging Area: Fourchon

Offshore Equipment Preferred Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Site	Hrs to Deploy	Total Hrs
T&T Marine (Available through contract with CGA)											
Aqua Guard Triton RBS (1)	22323	2000	1 Utility	6	Galveston	4	12	11.8	11	2	40.8
Aqua Guard Triton RBS (1)	22323	2000	1 Utility	6	Harvey	4	12	2.7	11	2	31.7
Koseq Skimming Arms (10) Lamor brush	228850	60000	10 OSV	60	Galveston	24	24	11.8	11	2	72.8
Koseq Skimming Arms (6) Lamor brush	137310	36000	6 OSV	36	Harvey	24	24	2.7	11	2	63.7
Koseq Skimming Arms (6) MariFlex 150 HF	108978	36000	6 OSV	36	Harvey	24	24	2.7	11	2	63.7
CGA											
FRU (2) + 100 bbl Tank (4)	8502	400	2 Utility	12	Vermilion	2	6	4.5	11	1	24.5
FRU (1) + 100 bbl Tank (2)	4251	200	1 Utility	6	Galveston	2	6	11.8	11	1	31.8
FRU (1) + 100 bbl Tank (2)	4251	200	1 Utility	6	Aransas Pass	2	6	16.5	11	1	36.5
FRU (2) + 100 bbl Tank (4)	8502	400	2 Utility	12	Venice	2	6	5	11	1	25
FRU (3) + 100 bbl Tank (6)	12753	600	3 Utility	18	Leeville	2	6	2	11	1	22
MSRC											
Crucial Disk 56/30 Skimmer (1)	5671	500	1 Utility	5	Ingleside	1	2	17	11	1	32
Stress I Skimmer (1)	15840	500	1 Utility	5	Ingleside	1	2	17	11	1	32
Crucial Disk 88/30 Skimmer (1)	11122	500	1 Utility	9	Galveston	1	2	12	11	1	27
Stress I Skimmer (1)	15840	500	1 Utility	5	Galveston	1	2	12	11	1	27
Stress I Skimmer (2)	31680	1000	2 Utility	10	Lake Charles	1	2	7	11	1	22

Staging Area: Fourchon

Offshore Equipment Preferred Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Site	Hrs to Deploy	Total Hrs
MSRC											
LFF 100 Brush Skimmer (1) *1,320' 67" Curtain Pressure Boom*	18086	400	1 PSV + 1-2 Support Vessels	9	Lake Charles	1	2	7	11	1	22
LFF 100 Brush Skimmer (1) *1,320' 67" Curtain Pressure Boom*	18086	400	1 PSV + 1-2 Support Vessels	9	Lake Charles	1	2	7	11	1	22
LFF 100 Brush Skimmer (1) *1,320' 67" Curtain Pressure Boom*	18086	400	1 PSV + 1-2 Support Vessels	9	Lake Charles	1	2	7	11	1	22
Transrec 350 Skimmer (1) *1,320' 67" Curtain Pressure Boom*	10567	400	1 PSV + 1-2 Support Vessels	9	Lake Charles	1	2	7	11	1	22
Transrec 350 Skimmer (1) *1,320' 67" Curtain Pressure Boom*	10567	400	1 PSV + 1-2 Support Vessels	9	Lake Charles	1	2	7	11	1	22
LFF 100 Brush Skimmer (1) *1,320' 67" Curtain Pressure Boom*	18086	400	1 PSV + 1-2 Support Vessels	9	Houma	1	2	2	11	1	17
Crucial Disk 56/30 Skimmer (1)	5671	400	1 Utility	5	Belle Chasse	1	2	3	11	1	18
Stress I Skimmer (1)	15840	500	1 Utility	5	Fort Jackson	1	2	5	11	1	20
Crucial Disk 88/30 Skimmer (1) *1,320' 67" Curtain Pressure Boom*	11122	400	1 PSV + 1-2 Support Vessels	9	Fort Jackson	1	2	5	11	1	20
Crucial Disk 88/30 Skimmer (1) *1,320' 67" Curtain Pressure Boom*	11122	400	1 PSV + 1-2 Support Vessels	9	Fort Jackson	1	2	5	11	1	20
Crucial Disk 88/30 Skimmer (1)	11122	500	1 Utility	9	Pascagoula	1	2	6	11	1	21
Stress I Skimmer (1)	15840	500	1 Utility	5	Pascagoula	1	2	6	11	1	21
Stress II Skimmer (1)	3017	400	1 Utility	5	Pascagoula	1	2	6	11	1	21
Stress I Skimmer (1)	15840	400	1 Utility	5	Tampa	1	2	22	11	1	37
Crucial Disk 56/30 Skimmer (1)	5671	400	1 Utility	5	Tampa	1	2	22	11	1	37
Stress I Skimmer (1)	15840	400	1 Utility	5	Miami	1	2	28	11	1	43

Staging Area: Fourchon

Offshore Equipment Preferred Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Site	Hrs to Deploy	Total Hrs
CGA											
Hydro-Fire Boom	NA	NA	8 Utility	40	Harvey	0	24	3	11	6	44
MSRC											
67" Curtain Pressure Boom (53570')	NA	NA	14*	7	Houston	1	2	11	11	1	26
1000' Fire Resistant Boom	NA	NA	3*	6	Galveston	1	4	12	11	6	34
16000' Fire Resistant Boom	NA	NA	3*	6	Houston	1	4	11	11	6	33
2000' Hydro Fire Boom	NA	NA	8*	8	Lake Charles	1	4	7	11	6	29

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

Nearshore Equipment from Spill Detection to Equipment Deployment Response Time: GC 680 Y

Nearshore Response – Cameron Parish

Nearshore Equipment Pre-determined Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
CGA											
Mid-Ship SWS	22885	249	NA	4	Galveston	2	0	N/A	48	1	51
Trinity SWS	21500	249	NA	4	Galveston	2	0	N/A	48	1	51
Trinity SWS	21500	249	NA	4	Vermilion	2	0	N/A	48	1	51
46' FRV	15257	65	NA	4	Aransas Pass	2	0	2	16	1	21
46' FRV	15257	65	NA	4	Vermilion	2	0	2	2.5	1	7.5
MSRC											
MSRC Quick Strike 2 LORI Brush Pack	5000	50	NA	6	Lake Charles	2	0	1	3	1	7
Enterprise Marine Services LLC (Available through contract with CGA)											
CTCo 2603	NA	25000	1 Tug	6	Amelia	26	0	6	15	1	48
CTCo 2607	NA	23000	1 Tug	6	Amelia	26	0	6	15	1	48
CTCo 2608	NA	23000	1 Tug	6	Amelia	26	0	6	15	1	48
CTCo 2609	NA	23000	1 Tug	6	Amelia	26	0	6	15	1	48
CTCo 5001	NA	47000	1 Tug	6	Amelia	26	0	6	15	1	48

Staging Area: Cameron

Nearshore and Inland Skimmers With Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Load Out	Travel to Staging	Travel to Deployment	Hrs to Deploy	Total Hrs
CGA											
SWS Egmopol	1810	100	NA	3	Galveston	2	2	5	2	1	12
SWS Marco	3588	20	NA	3	Vermilion	2	2	2	2	1	9
Foilex Skim Package (TDS 150)	1131	50	1 Utility	3	Vermilion	4	12	2	2	2	22
Foilex Skim Package (TDS 150)	1131	50	1 Utility	3	Galveston	4	12	5	2	2	25
4 Drum Skimmer (Magnum 100)	680	100	1 Crew	3	Vermilion	2	2	2	2	1	9
2 Drum Skimmer (TDS 118)	240	100	1 Crew	3	Vermilion	2	2	2	2	1	9
MSRC											
30 ft. Kvichak *Marco I Skimmer*	3588	24	NA	2	Ingleside	1	1	10	2	1	15
30 ft. Kvichak *Marco I Skimmer*	3588	24	NA	2	Galveston	1	1	3.6	2	1	8.6
Walosep 4 Skimmer (1)	3017	400	1 Utility	5	Galveston	1	1	3.6	2	1	8.6
Queensboro Skimmer (1)	905	400	1 Utility	4	Galveston	1	1	3.6	2	1	8.6
Queensboro Skimmer (5)	4525	2000	5 Utility	20	Lake Charles	1	1	1.5	2	1	6.5
AardVac Skimmer (1)	3840	400	1 Utility	4	Lake Charles	1	1	1.5	2	1	6.5

Shoreline Protection – Cameron Parish

Staging Area: Cameron

Shoreline Protection Boom	VOO	Persons Req.	Storage/Warehouse Location	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Deployment	Hrs to Deploy	Total Hrs
ES&H (available through MSA)									
14,000' 18" Boom	6 Crew	12	LaPlace, LA	.5	.5	6	2	4	13
16,000' 18" Boom	6 Crew	12	Lake Charles, LA	.5	.5	2	2	4	9
100' 18" Boom	1 Crew	2	Morgan City, LA	.5	.5	6	2	1	10
1,000' 18" Boom	1 Crew	2	Fourchon, LA	.5	.5	7	2	1	11

Wildlife Response	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Load Out	Travel to Staging	Travel to Deployment	Hrs to Deploy	Total Hrs
CGA											
Bird Scare Guns (12)	NA	NA	NA	2	Aransas Pass	2	2	9.5	1	2	16.5
Bird Scare Guns (48)	NA	NA	NA	2	Vermilion	2	2	2	1	2	9

Nearshore Response – Plaquemines Parish

Nearshore Equipment Pre-determined Staging	EDRC	Storage Capacity	VOO	Persons Required	From	Hrs to Procure	Hrs to Loadout	Hrs to GOM	Travel to Spill Site	Hrs to Deploy	Total Hrs
CGA											
Mid-Ship SWS	22885	249	NA	4	Leeville	2	0	N/A	48	1	51
Mid-Ship SWS	22885	249	NA	4	Venice	2	0	N/A	48	1	51
Trinity SWS	21500	249	NA	4	Vermilion	2	0	N/A	48	1	51
Trinity SWS	21500	249	NA	4	Leeville	2	0	N/A	48	1	51
46' FRV	15257	65	NA	4	Leeville	2	0	2	6	1	11
46' FRV	15257	65	NA	4	Venice	2	0	2	2	1	7
MSRC											
MSRC Lightning 2 LORI Brush Pack	5000	50	NA	6	Tampa	2	0	1	20	1	24
Enterprise Marine Services LLC (Available through contract with CGA)											
CTCo 2604	NA	20000	1 Tug	6	Amelia	25	0	6	16	1	48
CTCo 2605	NA	20000	1 Tug	6	Amelia	25	0	6	16	1	48
CTCo 2606	NA	20000	1 Tug	6	Amelia	25	0	6	16	1	48
Kirby Offshore (available through contract with CGA)											
RO Barge	NA	100000+	1 Tug	6	Venice	48	0	4	7	1	60

Staging Area: Venice

Nearshore Equipment With Staging	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Load Out	Travel to Staging	Travel to Deployment	Hrs to Deploy	Total Hrs
					CGA						
SWS Egmopol	1810	100	NA	3	Leeville	2	2	4.5	2	1	11.5
SWS Marco	3588	34	NA	3	Leeville	2	2	4.5	2	1	11.5
SWS Marco	3588	34	NA	3	Venice	2	2	2	2	1	9
Foilex Skim Package (TDS 150)	1131	50	1 Utility	3	Harvey	4	12	2	2	2	22
4 Drum Skimmer (Magnum 100)	680	100	1 Crew	3	Harvey	2	2	2	2	1	9
2 Drum Skimmer (TDS 118)	240	100	1 Crew	3	Harvey	2	2	2	2	1	9
					MSRC						
30 ft. Kvichak *Marco I Skimmer*	3588	24	NA	2	Belle Chasse	1	1	2	2	1	7
30 ft. Kvichak *Marco I Skimmer*	3588	24	NA	2	Pascagoula	1	1	5.5	2	1	10.5
Queensboro Skimmer (1)	905	400	1 Utility	4	Belle Chasse	1	1	2	2	1	7
AardVac Skimmer (1)	3840	400	1 Utility	4	Pascagoula	1	1	5.5	2	1	10.5
WP 1 Skimmer (1)	3017	400	1 Utility	4	Pascagoula	1	1	5.5	2	1	10.5
Queensboro Skimmer (1)	905	400	1 Utility	4	Pascagoula	1	1	5.5	2	1	10.5
WP 1 Skimmer (1)	3017	400	1 Utility	4	Tampa	1	1	21	2	1	26
AardVac Skimmer (2)	7680	800	2 Utility	8	Miami	1	1	27	2	1	32
WP 1 Skimmer (1)	3017	400	1 Utility	4	Miami	1	1	27	2	1	32

Shoreline Protection – Plaquemines Parish

Staging Area: Venice

Shoreline Protection Boom	VOO	Persons Req.	Storage/Warehouse Location	Hrs to Procure	Hrs to Loadout	Travel to Staging	Travel to Deployment Site	Hrs to Deploy	Total Hrs
AMPOL (available through MSA)									
34,050' 18" Boom	13 Crew	26	New Iberia, LA	2	2	6	2	12	24
12,850' 18" Boom	7 Crew	14	Chalmette, LA	2	2	2.5	2	6	14.5
900' 18" Boom	1 Crew	2	Morgan City, LA	2	2	4.5	2	2	12.5
3,200' 18" Boom	2 Crew	4	Venice, LA	2	2	0	2	2	8
12,750' 18" Boom	7 Crew	14	Port Arthur, TX	2	2	10	2	6	22
OMI Environmental (available through MSA)									
14,000' 18" Boom	6 Crew	12	Belle Chasse, LA	1	1	2	2	3	9
2,000' 18" Boom	1 Crew	2	Galliano, LA	1	1	4	2	3	11
1,800' 18" Boom	1 Crew	2	Gonzalez, LA	1	1	4	2	3	11
11,800' 18" Boom	5 Crew	10	Harvey, LA	1	1	2	2	3	9
2,000' 18" Boom	2 Crew	4	Houma, LA	1	1	4	2	3	11
2,400' 18" Boom	2 Crew	4	Morgan City, LA	1	1	5	2	3	12
3,800' 18" Boom	2 Crew	4	New Iberia, LA	1	1	6	2	3	13
2,300' 18" Boom	2 Crew	4	Port Allen, LA	1	1	5	2	3	12
1,500' 18" Boom	1 Crew	2	Venice, LA	1	1	0	2	3	7
19,000' 18" Boom	6 Crew	12	Deer Park, TX	1	1	12	2	3	19
11,000' 18" Boom	5 Crew	10	La Marque, TX	1	1	13	2	3	20
20,000' 18" Boom	6 Crew	12	Port Arthur, TX	1	1	10	2	3	17

Wildlife Response	EDRC	Storage Capacity	VOO	Persons Req.	From	Hrs to Procure	Hrs to Load Out	Travel to Staging	Travel to Deployment	Hrs to Deploy	Total Hrs
CGA											
Wildlife Support Trailer	NA	NA	NA	2	Harvey	2	2	2	1	2	9
Bird Scare Guns (24)	NA	NA	NA	2	Harvey	2	2	2	1	2	9
Bird Scare Guns (12)	NA	NA	NA	2	Galveston	2	2	13	1	2	20
Bird Scare Guns (24)	NA	NA	NA	2	Leeville	2	2	4.5	1	2	11.5

Response Asset	Total
Offshore EDRC (bbls)	1,147,682
Offshore Recovered Oil Storage (bbls)	1,548,996+
Nearshore / Shallow Water EDRC (bbls)	294,320
Nearshore / Shallow Water Recovered Oil Storage (bbls)	310,437+

Operational Limitations of Response Equipment

- HOSS Barge–8 foot seas
- Fast Response Vessel (FRV)–8 foot seas
- Oil Spill Response Vessel (OSRV and R/V)–4 foot seas
- Boom–3 foot seas, 20 knot winds
- Dispersants–winds more than 25 knots, visibility less than 3 nautical miles or ceiling less than 1,000'

SECTION I
ENVIRONMENTAL MONITORING AND ENVIRONMENTAL MITIGATION MEASURES

(a) Monitoring

If required, Anadarko will monitor loop currents per NTL 2018-G01.

Anadarko subscribes to WeatherOps which provides real-time weather conditions such as tropical depressions, storms and/or hurricanes entering the Gulf.

(b) Incidental Takes

Anadarko will utilize a contracted rig to perform the operations proposed under this revised plan. The following information utilizes specs from the *Noble BlackHawk* drillship; however, a different rig (DP drillship or DP-semi) may be utilized during operations. There are no anchors, ropes, or chains associated with the operations proposed in this plan, this includes the drillship, supply boats and crew boats.

Anadarko will not utilize any new or unusual technology during the operations proposed under this plan.

The *Noble BlackHawk* has a typical moon pool that is used in all deepwater Dynamic Positioned Drillships and Semi-submersibles. The moon pool is located in the center of the rig with a rectangular opening measuring 73' x 42'. The moon pool's purpose is to allow access to the water to drill, complete and workover wells. This also allows access to run the Blowout Preventer (BOP) to latch-up to the well for well control in the event of an emergency. There is no closing mechanism for the moon pool as it is always open to the sea. In normal operating mode, the draft of the vessel is 36'.

In the unlikely scenario that marine life becomes entrapped and/or entangled by equipment in the Moonpool, or by other rig equipment, the following mitigations will be exercised to protect marine life:

- Provide a dedicated crew member to survey the moonpool area for marine life while moving any equipment in or out of the moonpool area.
- Operations will cease, when safe to do so, if marine life that may be endangered is detected in the moonpool area and will not resume until the area is free and clear.
- Monitor video from the three cameras that is focused on the moonpool area.
- If endangered marine life is detected within a close proximity of the proposed operations, a live video feed can stream real-time footage for additional coverage.
- In most cases, if marine life is entrapped or entangled, someone can be safely lowered into the moonpool to free it.

Although marine mammals may be seen in the area, Anadarko does not believe that its operations proposed under this Supplemental EP will result in the harassment, capture, collection or killing of any mammals covered by the Marine Mammal Protection Act.

Anadarko will operate in accordance with applicable regulations, including:

- NTL No. 2016-G02 "Implementation of Seismic Survey Mitigation Measures and Protected Species Observer Program"
- BSEE NTL No. 2015-G03 "Marine Trash and Debris Awareness and Elimination"
- JOINT NTL No. 2016-G01 "Vessel Strike Avoidance and Injured/Dead Protected Species Reporting", and
- National Marine Fisheries Service Biological Opinion issued on May 20, 2025:
    - Attachment 1 (Appendix A.1): Geophysical Survey Protocols
    - Attachment 2 (Appendix A.2): Marine Trash and Debris Awareness and Elimination Survey Protocols
    - Attachment 3 (Appendix A.3): Vessel Strike Avoidance and Injured and/or Dead Aquatic Protected Species Reporting Protocols
    - Attachment 4 (Appendix A.6): Vessel Transit within the Rice's Whale Area as identified in the 2020 Biological Opinion's Reasonable and Prudent Alternative (2020 RWA)
    - Attachment 6 (Appendix A.5): Moon Pool Monitoring Protocol
    - Attachment 10 (Appendix A.7): Sea Turtle Resuscitation Guidelines Protocol

SECTION J
LEASE STIPULATIONS INFORMATION

Area/Block	**Lease #**	**Sale #**
GC 679	OCS-G21811	175
GC 680	OCS-G22987	178, Part 1

Lease Sale 175; Lease Sale 178, Part 1
Lease Stipulation - Military Warning Area

GC 679, 680 are located within Military Warning Area W-92. Anadarko will contact the Naval Air Station, Air Operations Department in Louisiana in order to coordinate and control the electromagnetic emissions during these proposed operations.

SECTION K
SUPPORT VESSELS AND AIRCRAFT INFORMATION

(a) General

Type	Max. Total Fuel Tank Storage Capacity	Max. No. in Area at any Time	Trip Frequency or Duration
Supply Vessel	336,227 gallons	1	2 trips/week
Helicopter	735.3 gallons	1	10 trips/week
Crew Vessel	70,000 gallons	1	3 trips/week
Support Vessel	450,698 gallons	1	3 days total/well
Tugboats	N/A	N/A	N/A

For vessel transit the most practical, direct route from each proposed shore base, as permitted by weather and traffic conditions, will be utilized. Anadarko does not anticipate that these routes will transit within the Rice's whale area (RWA) for the operations covered under this plan as identified in the 2020 Biological Opinion's Reasonable and Prudent Alternative (2020 RWA) found in the Biological Opinion (BiOp) issued by the National Marine Fisheries Service (NMFS) on May 20, 2025. In the event vessel routes change, BSEE/BOEM will be contacted 15 days in advance.

(b) Diesel Oil Supply Vessels

Fuel for the rig will be transported via a supply vessel as follows:

a. Size of fuel supply vessel:	230'
b. Carrying capacity of fuel supply vessel:	336,227 gallons
c. Frequency that fuel supply vessel will visit the facilities:	Twice per week
d. Routes the fuel supply vessel will use to travel between the onshore support base and proposed facility:	Shortest route from shore-base to block

(c) Vicinity Map

A vicinity map is included in this section as **Attachment K-1.**

(d) Produced Liquid Hydrocarbons Transportation Vessels

Produced liquid hydrocarbons from future flow tests on wells in GC 679 and 680 will be transported by 1-2 flowback vessels and/or flowback barge. Extended flow tests are planned for each well location covered under this Supplemental EP. Anadarko anticipates flaring a max volume of 15 mmscf/well total during the 48-hour flow test period.

Transport Method	Vessel Capacity (estimated)	Average Volume to be Loaded (per vessel)	No. of Transfers (Yearly Average)
Flowback Vessel	3,000 – 10,000 bbls	5,000-15,000 bopd	1-2/well
Flowback Barge	50,000 – 130,000 bbls	15,000-30,000 bopd	1/well

(e) Summary of Method to Transfer Liquid Hydrocarbons to the Transporting Vessel

Production from the well will be routed through portable surface well test equipment and safety controls aboard the rig. Gas will be flared and liquids (oil and water) will be collected in U.S. Coast Guard approved tanks and a boat/barge. Each well will be produced/cleaned up and measured using various meters through portable surface well test equipment including a separator to a maximum rate of 15,000 bopd and 15,000 mcfpd. A three phase separator will be used to analyze water cut if present. All liquids (hydrocarbons and water) will then be transferred to a coast guard approved flowback vessel or barge via tested and approved petroleum transfer hose. A Safe Breakaway Coupling (KLAW) will be installed between the hoses connecting the barge-end and the rig-end. If this device parts the KLAW is designed to contain all fluids from both hoses.

(f) Solid and Liquid Wastes Transportation

Type of Waste	Composition	Total Projected Amount	Rate	Transport Method	Name/Location of Facility	Disposal Method
Synthetic-based drilling fluid or mud	Synthetic-based drilling muds	570,000 bbls	28,500 bbls/well	Transport to shore in DOT approved containers	1. Baroid or MI Swaco - Fourchon 2. R360 - Fourchon Transfer Station 3. EcoServ – Fourchon Transfer Station	1. Recycle or Reuse 2. Landfarm 3. Injection Well
Cuttings wetted with synthetic-based muds	Cuttings coated with synthetic drilling muds, including drilled out cement	7,800-15,600 bbls	390-780 bbls/well* **An estimated 5-10% of cuttings may be transported to shore*	Transport to shore in DOT approved containers	1. R360 - Fourchon Transfer Station	1. Landfarm

Well treatment fluids	Ethylene glycol Methanol	13,333 bbls 3,333 bbls	100 bbls/month 25 bbls/month	Transport to shore in DOT approved containers	1. LEI – Hammond, LA 2. Chemical Waste Managment - Lake Charles, LA	1. Landfill, reuse, solvent recovery, fuel blending, or incineration 2. Landfill, reuse, solvent recovery, fuel blending, or incineration
Used - Completion /Workover/ Stimulation Fluids	Brine, acid, prop sand, debris, gelled fluids, dead oil	60,000 bbls	3,000 bbls/well	Transport to shore in DOT approved containers	1. R360 - Fourchon Transfer Station 2. EcoServ – Fourchon transfer station	1. Landfarm 2. Injection well
Unused - Completion /Workover/ Stimulation Fluids	Brine, acid, prop sand, debris, gelled fluids, dead oil	60,000 bbls	3,000 bbls/well	Transport to shore in DOT approved containers	1. Anadarko Petroleum Corporation (PMF) – Fourchon 2. LEI – Hammond, LA 3. Chemical Waste Managment - Lake Charles, LA	1. Reuse 2. Landfill, reuse, solvent recovery, fuel blending, or incineration 3. Landfill, reuse, solvent recovery, fuel blending, or incineration
Trash and debris	Refuse generated during operations	6,667 bbls	50 bbls/month/well	Transport to shore in DOT approved containers	1. Republic Services – LaRose, LA 2. Total Waste Solutions – Golden Meadow, LA	1. Landfill 2. Landfill
Used oil	Excess oil from engines	14,333 bbls	430 bbls/120 days/well	Transport to shore in DOT approved containers	1. Breaux – Lockport, LA (Drilling Contractors Responsibility)	1. Recycled

Total amount assumes drilling & completing 20 wells with 4,000 Total No. of Days (200 days to drill & complete each well)

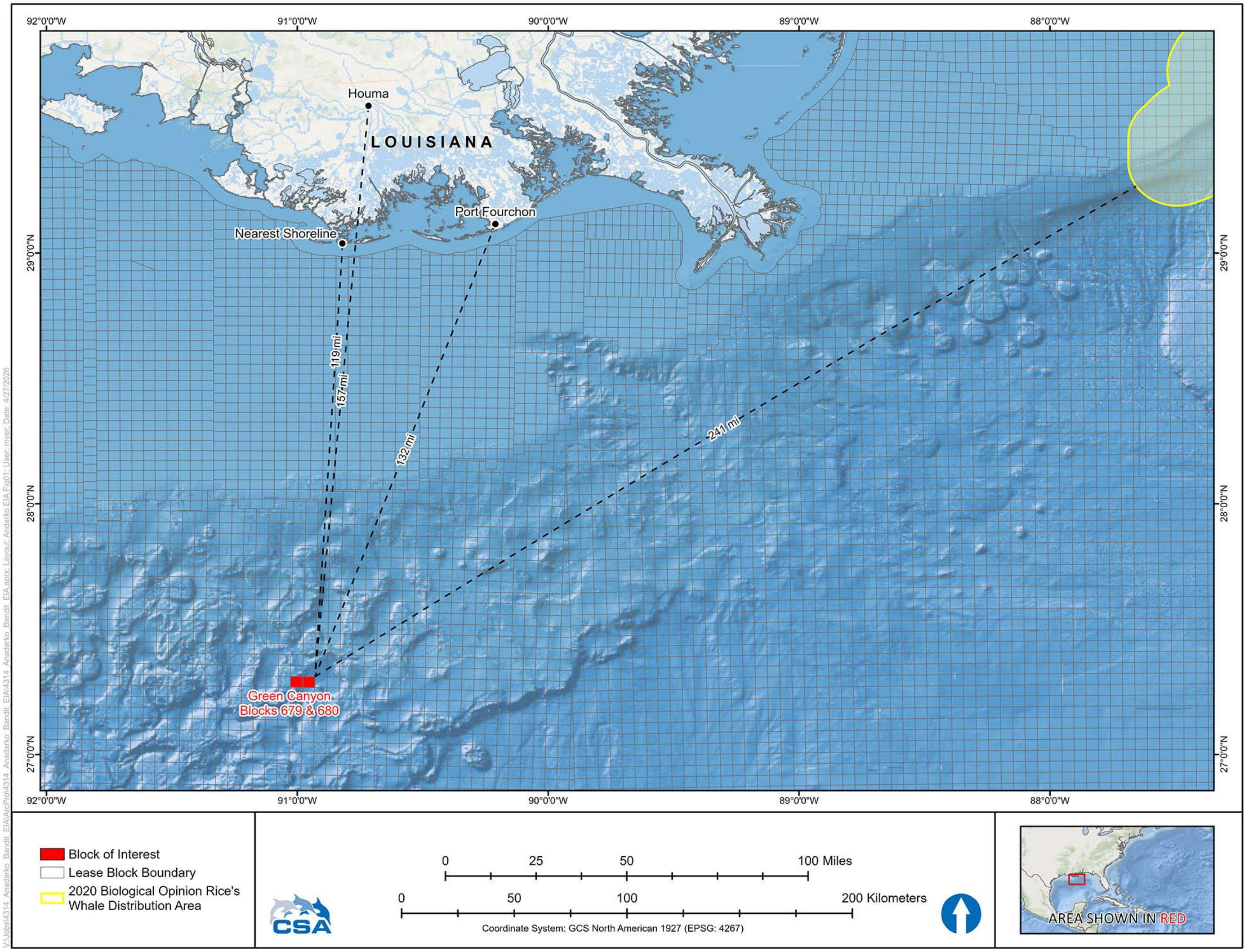


Figure 1. Location of Green Canyon Blocks 679 and 680 relative to the Louisiana shoreline, the Rice's whale habitat area, and offshore bathymetric contours.

SECTION L
ONSHORE SUPPORT FACILITIES INFORMATION

(a) General

Per NTL No. 2008-G04, the following tables reflect the onshore facilities Anadarko may utilize to provide supplies and service support for the activities proposed in this Supplemental EP.

Name	Primary Location(s)	Existing/New/Modified
Anadarko Service Base	Fourchon, Louisiana	Existing
Anadarko Service Base (equipment, parts)	Broussard, Louisiana	Existing
Anadarko Service Base (helicopter base)	Houma, LA**	Existing

Name	*Alternate Locations	Existing/New/Modified
Anadarko Service Base	Galveston, TX	Existing
Anadarko Service Base (helicopter base)	Lake Charles, LA**	Existing

**In the unlikely event Anadarko's primary service base cannot be utilized Anadarko will exercise the use of an alternate service base during drilling and/or completion operations.*
***Helicopter base*

(b) Support Base

No support base construction or expansion is planned for these activities.

(c) Waste Disposal

Disposed wastes describe those wastes generated by the proposed activity that are disposed of by means other than by release into the water of the GOM at the site where they are generated. These wastes can be disposed of by offsite release, injection, encapsulation, or placement at either onshore or offshore permitted locations for the purposes of returning them back to the environment.

Type of Waste	Composition	Total Projected Amount	Rate	Transport Method	Name/Location of Facility	Disposal Method
Synthetic-based drilling fluid or mud	Synthetic-based drilling muds	570,000 bbls	28,500 bbls/well	Transport to shore in DOT approved containers	1. Baroid or MI Swaco - Fourchon 2. R360 - Fourchon Transfer Station 3. EcoServ – Fourchon Transfer Station	1. Recycle or Reuse 2. Landfarm 3. Injection Well
Cuttings wetted with synthetic-based muds	Cuttings coated with synthetic drilling muds, including drilled out cement	7,800-15,600 bbls	390-780 bbls/well* **An estimated 5-10% of cuttings may be transported to*	Transport to shore in DOT approved containers	1. R360 - Fourchon Transfer Station	1. Landfarm

			shore			
Type of Waste	**Composition**	**Total Projected Amount**	**Rate**	**Transport Method**	**Name/Location of Facility**	**Disposal Method**
Well treatment fluids	Ethylene glycol Methanol	13,333 bbls 3,333 bbls	100 bbls/month 25 bbls/month	Transport to shore in DOT approved containers	1. LEI – Hammond, LA 2. Chemical Waste Managment - Lake Charles, LA	1. Landfill, reuse, solvent recovery, fuel blending, or incineration 2. Landfill, reuse, solvent recovery, fuel blending, or incineration
Used - Completion /Workover/ Stimulation Fluids	Brine, acid, prop sand, debris, gelled fluids, dead oil	60,000 bbls	3,000 bbls/well	Transport to shore in DOT approved containers	1. R360 - Fourchon Transfer Station 2. EcoServ – Fourchon transfer station	1. Landfarm 2. Injection well
Unused - Completion /Workover/ Stimulation Fluids	Brine, acid, prop sand, debris, gelled fluids, dead oil	60,000 bbls	3,000 bbls/well	Transport to shore in DOT approved containers	1. Anadarko Petroleum Corporation (PMF) – Fourchon 2. LEI – Hammond, LA 3. Chemical Waste Managment - Lake Charles, LA	1. Reuse 2. Landfill, reuse, solvent recovery, fuel blending, or incineration 3. Landfill, reuse, solvent recovery, fuel blending, or incineration
Trash and debris	Refuse generated during operations	6,667 bbls	50 bbls /month/ well	Transport to shore in DOT approved containers	1. Anadarko Petroleum Corporation (PMF) – Fourchon 2. LEI – Hammond, LA 3. Chemical Waste Managment - Lake Charles, LA	1. Reuse 2. Landfill, reuse, solvent recovery, fuel blending, or incineration 3. Landfill, reuse, solvent recovery, fuel blending, or incineration
Used oil	Used oil from engines	14,333 bbls	430 bbls/120 days/well	Transport to shore in DOT approved containers	1. Republic Services – LaRose, LA 2. Total Waste Solutions – Golden Meadow, LA	1. Landfill 2. Landfill

Total amount assumes drilling & completing 20 wells with 4,000 Total No. of Days (200 days to drill & complete each well)

SECTION M
COASTAL ZONE MANAGEMENT ACT INFORMATION

Louisiana Consistency reviews for GC 679 (G-21811) and GC 680 (G-22987) were completed for Anadarko Petroleum Corporation under previous Exploration Plans.

Texas Consistency reviews for GC 679 (G-21811) have not been previously conducted for Anadarko Petroleum Corporation and therefore will be reviewed with this Supplemental EP submittal.

TEXAS COASTAL MANAGEMENT PROGRAM

The following is an evaluation that includes findings relating the coastal effects of the proposed activities and associated facilities to the relevant enforceable policies of the Texas' Coastal Management Program (TCMP), Title 31, Part 16, Chapter 501, Subchapter B*:*

(Category 2)
Construction, Operation & Maintenance of Oil & Gas Exploration & Production Facilities

No operations are proposed in or near any critical areas. The proposed activities are explorative in nature, so no facility construction is proposed. The proposed activities are located approximately 220 miles from the Texas shoreline; therefore we expect no adverse impacts to CNRAs or beach access and use rights of the public. All activities shall be conducted in a manner that minimizes significant impacts to coastal resources. No adverse effects to Texas' coastal area are expected in association with the proposed activities.

(Category 3)
Discharges of Wastewater and Disposal of Waste from Oil and Gas Exploration and Production Activities

No discharge of wastewater or disposal of waste from the proposed activities will occur in the Texas' coastal zone; therefore no impact to Texas' coastal waters is expected.

(Category 4)
Construction and Operation of Solid Waste Treatment, Storage, and Disposal Facilities

No construction of solid waste facilities or expansion of existing facilities in the coastal zone are proposed in the attached plan, therefore, no adverse effects on any features of Texas' coastal cone are expected.

(Category 5)
Prevention, Response, and Remediation of Oil Spills

The proposed activities will be covered under an approved Regional Oil Spill Response Plan. The plan is in place, practiced, and updated as necessary. The best practical techniques shall be utilized to prevent the release of pollutants or toxic substances into the environment. All involved vessels and facilities are designed to be capable of prompt response and adequate removal of accidental discharges of oil. In addition, the proposed activities are 220 miles from shore; therefore no damages to natural resources are expected as the result of an unauthorized discharge of oil into coastal waters.

(Category 6)
Discharge of Municipal and Industrial Waste Water to Coastal Waters

No discharges from the proposed activities will occur in coastal waters. The proposed activities are 220 miles from shore; therefore there will be no effect on coastal waters.

(Category 8)
Development in Critical Areas

None of the proposed activities will occur in a critical area; therefore no effects to Texas' coastal zone are expected. The activity will not jeopardize the continued existence of species listed as endangered or threatened, and will not result in likelihood of the destruction or adverse modification of a habitat determined to be a critical habitat under the Endangered Species Act. The activity will not cause or contribute to violation of any applicable surface water quality standards. The activity will not violate any requirement imposed to protect a marine sanctuary.

(Category 9)
Construction of Waterfront Facilities and Other Structures on Submerged lands

No waterfront facilities or other structures are proposed on submerged lands in the Texas coastal zone, therefore the proposed activities are not expected to have any adverse impacts on submerged lands.

(Category 10)
Dredging and Dredged Material Disposal and Placement

No dredging or disposal/placement of dredged material is proposed; therefore no adverse effects to coastal waters, submerged lands, critical areas, coastal shore areas, or Gulf beaches are expected.

(Category 11)
Construction in the Beach / Dune System

The proposed activities do not include any construction projects in critical dune areas or areas adjacent to or on Gulf beaches, therefore, no impact to Texas' beach or dune systems are expected.

(Category 15)
Alteration of Coastal Historic Areas

The proposed activities do not include any alteration or disturbance of a coastal historic area; therefore, no impacts are expected to adversely affect any historical, architectural, or archaeological site in Texas' coastal zone.

(Category 16)
Transportation

The proposed activities do not include any transportation construction projects within the coastal zone; therefore, no impacts to Texas' coastal zone are expected.

(Category 17)
Emission of Air Pollutants

The proposed activities shall be carried out in conformance with applicable air quality laws, standards, and regulations. Emissions from the proposed activities are not expected to have significant impacts on onshore air quality because of the prevailing atmospheric conditions, emission heights, emission rates, and the distance of these emissions from the coastline. The proposed activities will occur approximately 220 miles from shore and will be within the exemption limits set by BOEM, therefore, no impacts to Texas' coastal zone is expected.

(Category 18)
Appropriations of Water

The proposed activities do not include the impoundment or diversion of state water, therefore, no impacts to Texas' coastal zone is expected.

(Category 20)
Marine Fishery Management

The proposed activities are located approximately 220 miles from shore and are not expected to have any effect on marine fishery management or fishery migratory patterns within waters in the coastal zone of Texas.

(Category 22)
Administrative Policies

The necessary information for applicable agencies to make an informed decision on the proposed activities has been provided In conclusion, all activities shall be consistent with Texas' coastal management program and shall comply with all relevant rules and regulations. No activities are planned within any critical areas. Activities will be carried out avoiding unnecessary conflicts with other uses of the vicinity.

STATE OF TEXAS

CONSISTENCY CERTIFICATION FOR

SUPPLEMENTAL EXPLORATION PLAN

GREEN CANYON BLOCKS 679
OCS-G 21811

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

Anadarko Petroleum Corporation

DocuSigned by:
Teri Powell
CC8D5F8E38CF441...

Teri Powell, Certifying Official
July 2026

SECTION N
ENVIRONMENTAL IMPACT ANALYSIS

Environmental Impact Analysis

for a
SUPPLEMENTAL EXPLORATION PLAN
for
Green Canyon Blocks 679 and 680 (OCS-G-21811 and OCS-G-22987)

Offshore Louisiana

June 2026

Prepared for:

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Environmental Impact Analysis
for a Supplemental Exploration Plan
for Green Canyon Blocks 679 and 680 (OCS-G-21811 and OCS-G-22987)

DOCUMENT NO. CSA-Anadarko-FL-26-4314-01-REP-01-003

Internal review process					
Version	Date	Description	Prepared by:	Reviewed by:	Approved by:
INT-01	04/27/2026	Initial draft for science review	J. Tiggelaar	A. Lawson	J. Tiggelaar
INT-02	05/01/2026	TE review	J. Tiggelaar	K. Metzger/ U. Riggs	J. Tiggelaar

Client deliverable			
Version	Date	Description	Project Manager Approval
001	05/12/2026	Draft client deliverable	J. Tiggelaar
002	05/29/2026	Draft client deliverable	J. Tiggelaar
003	06/01/2026	Draft client deliverable	J. Tiggelaar

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Acronyms and Abbreviations

μPa	micropascal
ac	acre
Anadarko	Anadarko Petroleum Corporation
bbl	barrel
BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
CFR	Code of Federal Regulations
CO	carbon monoxide
dB	decibel
DP	dynamically positioned
DPS	distinct population segment
EFH	Essential Fish Habitat
EIA	Environmental Impact Analysis
EIS	Environmental Impact Statement
EP	Exploration Plan
ESA	Endangered Species Act
FAD	fish aggregating device
FR	*Federal Register*
GC	Green Canyon
GPS	global positioning system
H_2S	hydrogen sulfide
ha	hectare
HAPC	Habitat Area of Particular Concern
IPF	impact-producing factor
km	kilometer
m	meter
MARPOL	International Convention for the Prevention of Pollution from Ships
MMC	Marine Mammal Commission
MMPA	Marine Mammal Protection Act
MMS	Minerals Management Service
MSRC	Marine Spill Response Corporation
MSV	multi-service vessel
MWCC	Marine Well Containment Company
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
PBR	potential biological removal
PM	particulate matter
re	referenced to
ROV	remotely operated vehicle
SEL_{24h}	sound exposure level over 24 hours
SEMS	Safety and Environmental Management system
SL	source level
SO_x	sulfur oxides
SPL	root-mean-square sound pressure level
TTS	temporary threshold shift
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

Anadarko Petroleum Corporation (Anadarko) is submitting a Supplemental Exploration Plan (EP) for Green Canyon Blocks 679 and 680, Gulf of America on the United States Outer Continental Shelf (OCS).

Under this EP, Anadarko proposes to drill and complete 20 wells, 12 with surface hole locations in GC 679 and 8 with surface hole locations in GC 680. This Environmental Impact Analysis (EIA) is based on the surface hole locations within GC 679 and 680, and provides information on the potential environmental impacts of Anadarko's proposed activities.

The project area is approximately 119 mi (192 km) from the nearest shoreline (Louisiana), 132 mi (212 km) from the onshore support base at Port Fourchon, Louisiana, and 157 mi (253 km) from the helicopter base at Houma, Louisiana (**Figure 1**). The water depth at the location of the proposed activities ranges from approximately 4,652 to 5,405 ft (1,418 to 1,647 m). A DP drilling rig will be used for the proposed activities. The proposed drilling is expected to take approximately 200 days per well.

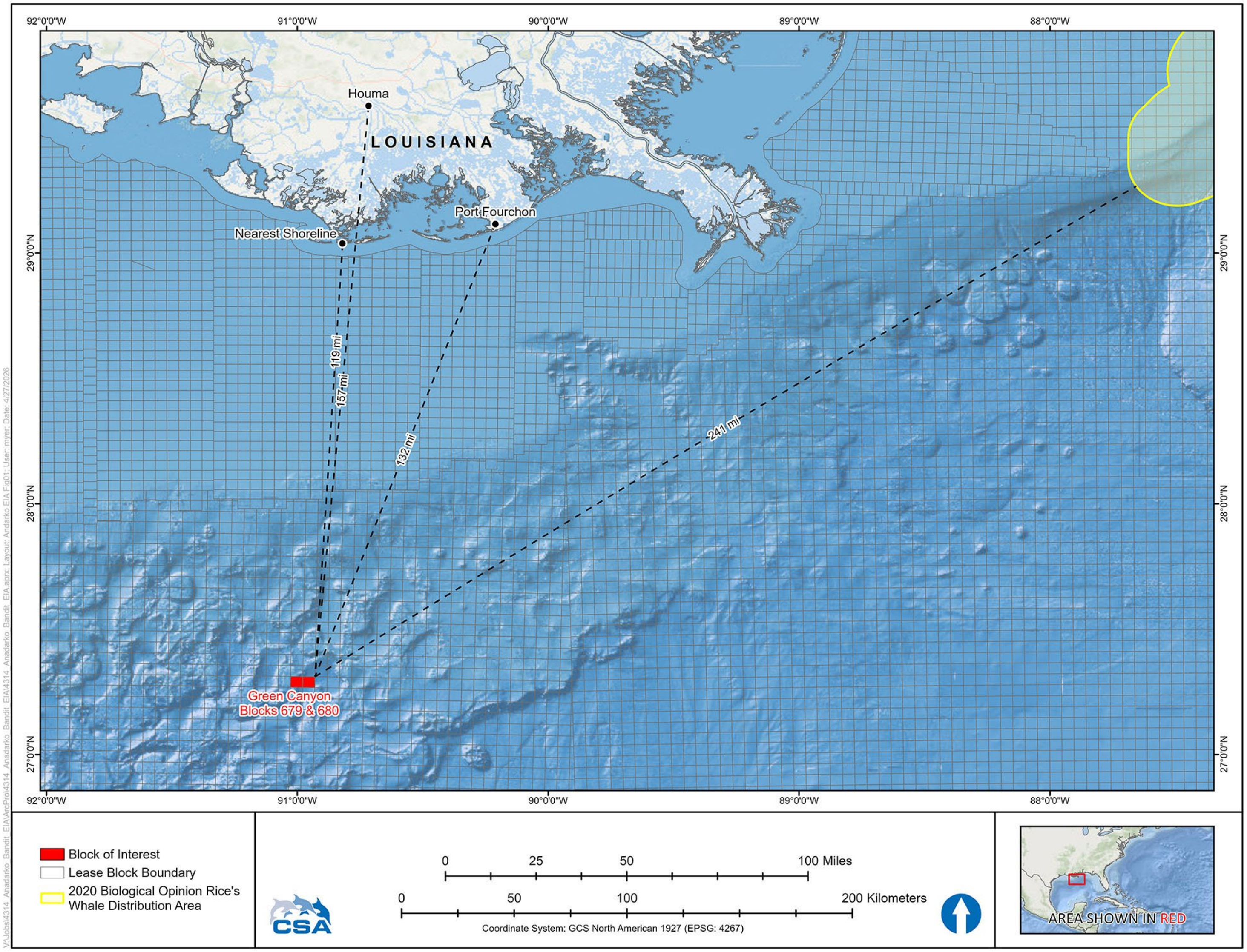

Figure 1. Location of Green Canyon Blocks 679 and 680 relative to the Louisiana shoreline, the Rice's whale habitat area, and offshore bathymetric contours.

The EIA for this EP 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) § 550.212 and § 550.227. The EIA is a project- and site-specific analysis of the potential environmental impacts of Anadarko'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) and 2015-N01. Potential impacts have been analyzed at a broader level in the 2024–2029 Programmatic Environmental Impact Statement (EIS) for the OCS Oil and Gas Leasing Program (BOEM, 2023a), in multisale EISs for the Western and Central Gulf of Mexico Planning Areas (BOEM, 2012a,b, 2013, 2014, 2015, 2016a,b, 2017a, 2023a,b) and in the Gulf of America Regional OCS Oil and Gas Leas Sales and Post-Lease Activities Final Programmatic EIS (BOEM, 2025). The most recent multisale EIS contains updated environmental baseline information in light of the *Deepwater Horizon* incident and addresses potential impacts of a catastrophic spill (BOEM, 2017a). The NMFS Biological Opinion on the Federally Regulated Oil and Gas Program Activities in the Gulf of Mexico assesses impacts and requires additional mitigation measures for protected species (NMFS, 2025a). The analyses and relevant information from those documents are incorporated in the EIA by reference.

All the proposed activities and facilities in this EP are covered by the Regional Oil Spill Response Plan (OSRP) approved in August 2015 for Anadarko Petroleum Corporation and its subsidiary Anadarko US Offshore LLC. (Company Numbers 00981 and 02219, respectively) in accordance with 30 CFR Part 254. The 2025 OSRP biennial update was submitted on June 30, 2025, and was deemed in compliance with 30 CFR 254.30(a) as of October 14, 2025

The OSRP details Anadarko's plan to rapidly and effectively manage oil spills that may result from drilling and production operations. Anadarko has designed its spill response program based on a regional capability of response to spills ranging from small operational spills to a worst-case discharge (WCD) from a well blowout. Anadarko's spill response program meets the response planning requirements of the relevant coastal states and applicable federal oil spill planning regulations. The OSRP also includes information regarding Anadarko's regional oil spill organization and dedicated response assets, potential spill risks, and local environmental sensitivities. It describes personnel and equipment mobilization, incident management team organization, and an overview of actions to be taken and notifications necessary 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-2020-G01	Air Quality Information Requirements for Exploration Plans, Development Operations Coordination Documents, and Development and Production Plans in the Gulf of Mexico Region	Cancels and supersedes the air emission information portion of NTL 2008-G04, Information Requirement for Exploration Plans and Development Operations Coordination Documents, effective date 5 May 2008.
BOEM-2016-G01 or Attachment 3 (NMFS, 2025a)	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 colliding with protected species; and requires operators to report sightings of any injured or dead protected species. This NTL may be reissued to address recent changes made in the 2025 NMFS Biological Opinion (NMFS, 2025a).
BOEM-2016-G02 or Attachment 1 (NMFS, 2025a)	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 BOEM, BSEE, and operators in order to comply with the Endangered Species Act and the Marine Mammals Protection Act. Reissued in June 2020 to address instances where guidance in the 2020 NMFS Biological Opinion (NMFS, 2020a) replaces compliance with this NTL.
BSEE-2015-G03 or Attachment 2 (NMFS, 2025a)	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 2015-N01	Information Requirements for Exploration Plans, Development and Production Plans, and Development Operations Coordination Documents on the Outer Continental Shelf (OCS) for Worst-Case Discharge and Blowout Scenarios	Provides guidance regarding information required in worst-case discharge descriptions and blowout scenarios.

Table 1. (Continued).

NTL	Title	Summary
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 America.
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.
2010-N10	Statement of Compliance with Applicable Regulations and Evaluation of Information Demonstrating Adequate Spill Response and Well Containment Resources	Informs operators using subsea blowout preventers (BOPs) or surface BOPs 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 BOEM 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 984 ft (300 m). Prescribes separation distances of 2,000 ft (610 m) from each mud and cuttings discharge location and 250 ft (76 m) from all other seafloor disturbances.

Table 1. (Continued).

NTL	Title	Summary
2009-G39	Biologically Sensitive Underwater Features and Areas	Provides guidance for avoiding and protecting biologically sensitive features and areas (e.g., topographic features, pinnacles, low relief live bottom areas, other potentially sensitive biological features) when conducting OCS operations in water depths less than 984 ft (300 m) in the Gulf of America.
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 for Covered Facilities	Provides clarification and guidance to operators/lessees on policies for submitting required Oil Spill Financial Responsibility documents to the Gulf of America 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. Reissued in June 2020 to comply with Executive Order 13891 of 9 October 2019 and to rescind NTL 2011-JOINT-G01.

A. Impact-Producing Factors

Based on the description of Anadarko's proposed activities, a series of impact-producing factors (IPFs) have been identified and presented in **Table 2**. **Table 2** provides a matrix of environmental resources that may be affected in the left column and sources of impacts (i.e., IPFs) 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 environmental resources that may be impacted as a result of one or more IPFs. The tabular matrix indicates which of the routine activities and accidental events could affect specific resources. An "X" indicates that an IPF could reasonably be expected to affect a certain resource, and a dash (--) indicates no impact or negligible impact (**Table 2**). Where there may be an effect, an impact analysis by resource is provided in **Section C**. Potential IPFs for the proposed activities are listed below and briefly discussed in the following sections:

- Drilling rig presence, underwater 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 underwater sound)
- Accidents

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

Environmental Resources	IPFs									
	Drilling Rig Presence (incl. sound & lights)	Physical Disturbance to Seafloor	Air Pollutant Emissions	Effluent Discharges	Water Intake	Onshore Waste Disposal	Marine Debris	Support Vessel/ Helicopter Traffic	Accidents	
									Small Fuel Spill	Large Oil Spill
Physical/Chemical Environment										
Air quality	--	--	**X**	--	--	--	--	--	**X**(6)	**X**(6)
Water quality	--	--	--	**X**	--	--	--	--	**X**(6)	**X**(6)
Seafloor Habitats and Biota										
Soft bottom benthic communities	--	**X**	--	**X**	--	--	--	--	--	**X**(6)
High-density deepwater benthic communities	--	--(4)	--	--(4)	--	--	--	--	--	**X**(6)
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)
Rice's 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)
Black-capped Petrel (Endangered)	**X**	--	--	--	--	--	--	**X**(8)	**X**(6,8)	**X**(6,8)
Rufa Red Knot (Threatened)	**--**	--	--	--	--	--	--	**X**(8)	**X**(6,8)	**X**(6,8)
Oceanic whitetip shark (Threatened)	**X**	--	--	--	--	--	--	--	--	**X(6)**
Giant manta ray (Threatened)	**X**	--	--	--	--	--	--	--	--	**X** (6)
Gulf sturgeon (Threatened)	--	--	--	--	--	--	--	--	--	**X**(6)
Nassau grouper (Threatened)	--	--	--	--	--	--	--	--	--	**X**(6)
Smalltooth sawfish (Endangered)	--	--	--	--	--	--	--	--	--	**X**(6)
Beach mice (Endangered)	--	--	--	--	--	--	--	--	--	**X**(6)
Florida salt marsh vole (Endangered)	--	--	--	--	--	--	--	--	--	**X**(6)
Panama City crayfish (Threatened)	--	--	--	--	--	--	--	--	--	**X**(6)

Table 2. (Continued).

Environmental Resources	IPFs									
	Drilling Rig Presence (incl. sound & lights)	Physical Disturbance to Seafloor	Air Pollutant Emissions	Effluent Discharges	Water Intake	Onshore Waste Disposal	Marine Debris	Support Vessel/ Helicopter Traffic	Accidents	
									Small Fuel Spill	Large Oil Spill
Threatened coral	--	--	--	--	--	--	--	--	--	**X**(6)
Queen conch	--	--	--	--	--	--	--	--	--	**X**(6)
Coastal and Marine Birds										
Marine birds	**X**	--	--	--	--	--	--	**X**	**X**(6)	**X**(6)
Coastal 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										
Coastal habitats and protected areas	--	--	--	--	--	--	--	**X**	--	**X**(6)
Socioeconomic and Other Resources										
Recreational and commercial fishing	**X**	--	--	--	--	--	--	--	**X**(6)	**X**(6)
Public health and safety	--	--	--	--	--	--	--	--	--	**X**(5,6)
Employment and infrastructure	--	--	--	--	--	--	--	--	--	**X**(6)
Recreation and tourism	--	--	--	--	--	--	--	--	--	**X**(6)
Land use	--	--	--	--	--	--	--	--	--	**X**(6)
Other marine uses	--	--	--	--	--	--	--	--	--	**X**(6)

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

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 500 ft (152 m) from any no-activity zone; or*
   (d) *Proximity of any submarine bank (152-m [500-ft] buffer zone) with relief greater than 7 ft (2 m) 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 on high-density deepwater benthic communities are anticipated. There are no features indicative of seafloor hard bottom that could support high-density chemosynthetic communities or coral communities within 2,000 ft (610 m) of the location of the proposed activities (Ocean Geo Solutions, 2024; Xodus, 2026a,b,c,d,e,f).

(5) *Exploration or production activities where Hydrogen Sulfide (H_2S) concentrations greater than 500 ppm might be encountered.*
   - GC 679 and 680 are classified as H_2S absent.

(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.*
   - Green Canyon Blocks 679 and 680 are not located in an area designated as having high archaeological potential, and as such, an Archaeological Report is not required per NTL No. 2011-JOINT-G01. However, an Archaeological Report was submitted under the Initial EP.

(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 drilling rig 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 Drilling Rig Presence, Underwater Sound, and Lights

A DP drillship or DP semisubmersible will be used for the proposed activities. 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 vessel, are activated to maintain position. This allows operations at sea in areas where mooring or anchoring may not be best suited or feasible. Consequently, there will be no anchoring during this project. The selected vessel is expected to be on site for an estimated 200 days per well. The drilling rig 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 drilling rig include the physical presence of the vessels in the ocean, working and safety lighting, and underwater sound produced during operations.

During the presence of the DP drilling rig at the project location, there may be an occasion where equipment is suspended in the water column. Entanglement and entrapment of protected species can occur from equipment with slack or looping lines and cables in the water. Marine mammals and sea turtles can become entangled in vessel lines in the water with loops or sufficient looping to trap the animals if they come into contact with them. Entanglement and entrapment can be minimized with proper maintenance of equipment lines in the water by encasing flexible lines, removing excess lines, and keeping lines taught to remove slack and line loops.

The physical presence of a DP drilling rig 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 and seabed mounted active acoustic equipment (such as ultra-short baseline systems) used for positioning. Of the aforementioned sources, only DP thruster activity is expected to produce sound at levels which could result in potential impacts on marine life.

The proposed activities can be expected to produce underwater sound associated with machinery on deck such as generators, pumps, and compressors onboard the drilling rig. The vessel and associated machinery transmit sound through the hull to the water, while propulsion machinery transmits sound directly to the water during station-keeping. An additional sound source comes from machinery operations from subsea equipment located on the seafloor. Machinery operations from the DP drilling rig during drilling and completion activities would produce low-frequency (<1 kHz) sound with an estimated source level (SL), expressed as root-mean-square sound pressure level (SPL), of 154 decibels (dB) referenced to (re) 1 micropascal (μPa) at 1 meter (m) which would not be expected to exceed ambient levels beyond approximately 0.62 mi (1 km) (Greene, 1986; Center for Marine Acoustics, 2023).

Underwater sound levels produced by DP vessels for station-keeping are largely dependent on the level of thruster activity required to keep position and, therefore, 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 195 dB re 1 µPa m, with a primary amplitude frequency below 600 Hz (Blackwell and Greene Jr., 2003, McKenna et al., 2012; Kyhn et al., 2014; Center for Marine Acoustics, 2023). BOEM (2012a) stated that source levels from oil and gas production platforms are low, with a frequency range of 50 to 500 Hz.

A.2 Physical Disturbance to the Seafloor

In water depths of 1,969 ft (600 m) or greater, DP drilling rigs disturb only a very small area of the seafloor around the wellbore. Depending on the specific well configuration, the total disturbed area is estimated to be 0.25 hectares (ha) (0.62 acres [ac]) per well (BOEM, 2012a).

A.3 Air Pollutant Emissions

Offshore air pollutant emissions will result from drilling rig operations as well from the support (work/supply) vessel and helicopter transits. These emissions occur mainly from combustion of diesel and aviation fuel (Jet A). The combustion of fuels occurs in diesel-powered generators, pumps, or motors and from lighter fuel motors. Primary air pollutants typically associated with emissions from internal combustion engines are suspended particulate matter ($PM_{2.5}$ and PM_{10}), sulfur oxides (SOx), nitrogen oxides (NOx), volatile organic compounds (VOCs), and carbon monoxide (CO) (Reşitoğlu et al., 2015), as well as ammonia (NH_3) and lead (Pb) per NTL BOEM 2020-G01.

The Air Quality Emissions Report (see EP Section G) prepared in accordance with BOEM requirements demonstrates that the projected 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 substantially affect the air quality of the onshore area for any of the criteria pollutants. No further analysis or control measures are required.

A.4 Effluent Discharges

Marine vessel effluent discharges are expected from project activities and are expected to be discharged in accordance with the conditions in the NPDES permit or USCG regulations (33 CFR 151.51-151.79 and 33 CFR 159) that pertain to the International Convention for the Prevention for Pollution from Ships (MARPOL) 73/78 Annex IV & V. These effluents include miscellaneous discharges that are untreated, effluents that are treated before discharge, and substances removed during wastewater control. Miscellaneous discharges will consist of uncontaminated seawater/freshwater, such as uncontaminated ballast/bilge water, fire water, cooling water, potable water, graywater from dishwater, shower, laundry, bath, and washbasin drains, off specification potable water and desalination unit discharge. Chemically treated effluents include seawater/freshwater to which treatment chemicals such as biocides or corrosion inhibitors have been added, sewage processed through a marine sanitation device, and deck drainage effluents passed through the drillship oil-water separator. Other discharges will include excess cement at the seafloor, cuttings wetted with water-based fluids, water-based drilling fluids, cuttings wetted with synthetic-based fluids, and non-pollutant completion fluids.

Waste streams that contain free oil will not be discharged as evidenced by the monitoring method specified for that particular stream (e.g., deck drainage) or miscellaneous discharges will not be discharged when they would cause a film or sheen upon or discoloration of the surface of the receiving water.

Under certain circumstances, project vessels may relocate to a safe zone which is not located within the leased area to avoid severe weather, 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 EP.

A.5 Water Intake

Seawater will be drawn from the ocean for once-through, non-contact cooling of machinery on the drilling rig. 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. The drilling rig ultimately selected for this project will be in compliance with all applicable cooling water intake structure design requirements, monitoring, and limitations.

A.6 Onshore Waste Disposal

Wastes generated during the proposed activities are tabulated in EP Section F. A total of approximately 50 bbl per month per well of trash and debris will be generated during the project. Trash will be transported to shore in disposal bags for final disposal by municipal operators in accordance with applicable regulations. Other wastes transported to shore for re-use, recycling, or disposal include synthetic-based drilling fluids, cuttings wetted with synthetic-based drilling fluids, chemical product waste (well treatment fluids), completion fluids, workover fluids/stim fluids, and used oil. All wastes will be transported to shore in containers approved by the U.S. Department of Transportation for re-use, recycling, or disposal in accordance with applicable regulations.

A.7 Marine Debris

Anadarko will 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, U.S. Coast Guard (USCG), Bureau of Safety and Environmental Enforcement (BSEE), and BOEM regulations. These regulations include prohibitions and compliance requirements regarding the deliberate discharging of containers and other similar materials (e.g., trash, 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 (e.g., trash, 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. Additionally, the debris awareness training, instruction, and placards required by the Protected Species Lease Stipulation should minimize the amount of debris that is accidentally lost overboard by offshore personnel (NMFS, 2025a).

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

Anadarko will use existing shorebase facilities in Port Fourchon, Louisiana, for support (work/supply) 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. IPFs associated with support vessel and helicopter traffic include their physical presence and operational sound.

A.8.1 Physical Presence

The project will be supported by a supply vessel making an estimated two round trips per week, a crew vessel making an estimated three round trips per week, and a support vessel onsite for three days total per well. NMFS (2025a) found that support vessel traffic has the potential to disturb protected species (e.g., marine mammals, sea turtles, fishes) and creates a risk of vessel strikes. The probability of a vessel strike depends on the number, size, and speed of vessels as well as the distribution, abundance, and behavior of the species (Laist et al., 2001; Jensen and Silber, 2004; Hazel et al., 2007; Vanderlaan and Taggart, 2007; Conn and Silber, 2013; NMFS, 2025a). 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 marine mammals 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. This NTL was reissued in June 2020 to address instances where guidance in the 2020 NMFS Biological Opinion (NMFS, 2020a) and the amended appendices in 2021 (NMFS, 2021) replaces compliance with the NTL. The vessels will typically move to the project area via the most direct route from the shorebase.

A helicopter will make approximately 10 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 700 ft (213 m) while in transit offshore, 1,000 ft (305 m) over unpopulated areas or across coastlines, and 2,000 ft (610 m) overpopulated areas and sensitive habitats such as wildlife refuges and park properties.

A.8.2 Underwater Sound

The offshore support vessel associated with the proposed project will contribute to the overall acoustic environment by transmitting underwater sound. The support vessel will use conventional diesel-powered screw propulsion. Vessel sound is a combination of narrow band (tonal) and broadband sound (Richardson et al., 1995; Hildebrand, 2009; McKenna et al., 2012; Johnson et al., 2025). Tones typically dominate up to approximately 50 Hz, whereas broadband sounds may extend to 100 kHz. The primary sources of vessel sound underwater are propeller cavitation, propeller singing, and propulsion; other sources include engine sound, flow sound from water dragging along the hull, and bubbles breaking in the vessel's wake (Richardson et al., 1995). The intensity of underwater sound produced from support vessels is roughly related to ship size, weight, and speed. Broadband SLs for smaller boats (a category that include supply and other service vessels) expressed as SPL are in the range of 150 to 180 dB re 1 µPa m (Richardson et al., 1995; Hildebrand, 2009; McKenna et al., 2012; Johnson et al., 2025).

Dominant tones in underwater sound spectra from helicopters are below 500 Hz with SLs, expressed as SPL, of approximately 149 to 151 dB re 1 µPa m (for a Bell 212 helicopter) (Richardson et al., 1995). Levels of sound 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). Penetration of aircraft sound below the sea surface is greatest directly below the aircraft. Aircraft sound 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 500 ft (152 m) that is audible in air for 4 minutes may be detectable under water for only 38 seconds at 10 ft (3 m) depth and for 11 seconds at 59 ft (18 m) depth (Richardson et al., 1995). Because of the relatively high expected air speeds during transits and these physical variables, aircraft-related sound (including both airborne and underwater sound) is expected to be very brief in duration.

A.9 Accidents

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

- A small fuel spill, which is the most likely type of spill during OCS exploration activities; and
- A large oil spill, up to and including the WCD for this EP, which is an oil spill resulting from an uncontrolled blowout.

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

EISs published by BOEM (BOEM, 2012a,b, 2013, 2014, 2015, 2016b, 2017a) analyzed three types of accidents relevant to operations that could lead to potential impacts to the marine environment: loss of well control, vessel collision, and chemical spills. These types of accidents, along with a hydrogen sulfide (H_2S) release, are discussed briefly below.

Loss of Well Control. A loss of well control is the uncontrolled flow of a reservoir fluid that may result in the release of gas, condensate, oil, drilling fluids, sand, and/or water. Loss of well control includes incidents from the very minor up to the most serious well control incidents, while blowouts are considered to be a subset of more serious incidents with greater risk of oil spill or human injury (BOEM, 2016a, 2017a). Loss of well control may result in the release of drilling fluid and/or loss of oil. Not all loss of well control events result in blowouts (BOEM, 2012a). In addition to the potential release of gas, condensate, oil, sand, and/or water, the loss of well control can also resuspend and disperse bottom sediments (BOEM, 2012a, 2017a). BOEM (2016a) noted that most OCS blowouts have resulted in the release of gas.

Anadarko has a robust system in place to prevent loss of well control. Measures to prevent a blowout, reduce the likelihood of a blowout, and conduct effective and early intervention in the event of a blowout are described in the NTL 2015-N01 package submitted with this EP, as required by BOEM (as discussed in **Section A.9.1**). The potential for a loss of well control event will be minimized by adhering to the requirements of applicable regulations and NTL 2010-N10, which specifies additional safety measures for OCS activities.

Vessel Collisions. BSEE data show that there were 226 OCS-related collisions between 2007 and 2025 (BSEE, nd). 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 in the OCS resulted in diesel spills, and during 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. As summarized by BOEM (2017a), vessel collisions occasionally occur during routine operations. Some of these collisions have caused spills of diesel fuel or chemicals. Anadarko will comply with all applicable USCG and BOEM safety requirements to minimize the potential for vessel collisions.

Dropped Objects. Objects dropped overboard the drilling rig 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, loss of integrity of seafloor pipelines, umbilicals, etc. could result in a spill. Dropped objects could also result in seafloor disturbance and potential impacts to benthic communities. Anadarko and its contractors intend to comply with all BOEM and BSEE safety requirements to minimize the potential for objects dropped overboard.

Chemical Spills. Chemicals are stored and used for pipeline hydrostatic testing, leak and pressure testing of subsea equipment and during well completion operations. The relative quantities of their use is reflected in the largest volumes spilled (BOEM, 2017b), with completion, workover, and treatment fluids comprising the largest releases. 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 ethylene glycol, monoethylene glycol 50/50, or methanol, and xylene. 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. GC 679 and 680 are 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 America 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 used. 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 (3 bbl of fuel) (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 of the spill 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 these oils are light to intermediate in molecular weight and can be readily degraded by aerobic microbial oxidation. 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 amounts of suspended solids (National Research Council, 2003a) and would not be expected to occur to any appreciable degree in offshore waters of the Gulf of America. Diesel fuel is readily and completely degraded by naturally occurring microbes (NOAA, 2023).

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 rapidly spread out, evaporate, and disperse into the water column (BOEM, 2012a).

For purposes of the EIA, the fate of a small diesel fuel spill of 3 bbl was estimated using WebGNOME, a publicly available oil spill trajectory and fate model developed by NOAA's Office of Response and Restoration (NOAA, 2022a) 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 would be evaporated or dispersed within 24 hours (NOAA, 2022a). 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 WebGNOME 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 119 mi (192 km) from the nearest shoreline (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 from shore 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. A discussion of Anadarko's response efforts if a spill were to occur during operational activities is provided in EP Section H.

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; International Tanker Owners Pollution Federation Limited, 2018).

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 EP are governed by Anadarko's Regional OSRP, which meets the requirements contained in 30 CFR 254.

A.9.2 Large Oil Spill (Worst-Case Discharge)

Spill Size. The WCD scenario for this project is defined as an uncontrollable oil discharge from the subsea wellbore resulting from a blowout incident. The scenario assumes that the wellhead fails mechanically, and a blowout occurs at the seafloor. The WCD volume for the well under this plan is 321,368 bbl per day. The maximum total volume during a blowout could potentially be 29,244,488 bbl, assuming 91 days for the maximum duration of a blowout, multiplied by the worst-case daily uncontrolled blowout volume of 321,368 bbl per day.

Blowout Scenario. Anadarko prepared this blowout scenario pursuant to guidance provided in NTL No. 2015-N01. It is expected it could take up to 91 days to complete drilling a relief well.

Spill Probability. Holland (1997) estimated a probability of 0.0021 for a deep drilling blowout during exploration drilling based on U.S. Gulf of America data. The International Association of Oil & Gas Producers (2010) conducted an analysis and estimated a blowout frequency of 0.0017 per exploratory well for non-North Sea locations. BOEM updated OCS spill frequencies (bbl spilled per bbl produced) to include the *Deepwater Horizon* incident. According to ABS Consulting Inc. (2016), the spill rate for spills >1,000 bbl dropped to 0.22 spills per billion barrels produced. According to the ABSG Consulting, Inc. (2018) analysis, the baseline risk of loss of well control spill >10,000 bbl on the OCS is estimated to be once every 27.5 years.

Spill Trajectory. The fate of a large oil spill in the project area would depend on meteorological and oceanographic conditions at the time of and during the spill. 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 America.

The project area is located within Launch Area 45 and the results are presented in **Table 3**. The model predicts a 1% to 4% conditional probability of shoreline contact within 30 days of a spill from Calhoun County, Texas to Plaquemines Parish, Louisiana (**Table 3**). Counties with a conditional probability for shoreline contact of <0.5% for 3, 10, and 30 days are not shown in **Table 3**.

Table 3. Conditional probabilities of a spill in the lease area contacting shoreline segments (From: Ji et al., 2004). Values are conditional probabilities that a hypothetical spill in the lease area (represented by Oil Spill Risk Analysis Launch Area 45) could contact shoreline segments within 3, 10, or 30 days.

Shoreline Segment	County or Parish and State	Conditional Probability of Contact[a] (%)		
		3 Days	10 Days	30 Days
C07	Calhoun County, Texas	--	--	1
C08	Matagorda County, Texas	--	--	1
C09	Brazoria County, Texas	--	--	1
C10	Galveston County, Texas	--	--	2
C12	Jefferson County, Texas	--	--	1
C13	Cameron Parish, Louisiana	--	--	4
C14	Vermilion Parish, Louisiana	--	--	2
C15	Iberia Parish, Louisiana	--	--	1
C17	Terrebonne Parish, Louisiana	--	--	2
C18	Lafourche Parish, Louisiana	--	--	1
C20	Plaquemines Parish, Louisiana	--	--	2

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

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.

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, 2017b). The spatial resolution is limited, with five launch points in the entire Western and Central Planning Areas of the Gulf of America. 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 3, located in the Central Planning Area and is presented in **Table 4**.

Table 4. Shoreline segments with a 1% or greater conditional probability of contact from a spill starting at Launch Point 3 based on the 60-day Oil Spill Risk Analysis (OSRA). 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] (%)															
Cameron, Texas	--	--	--	--	--	--	--	2	--	--	--	1	--	--	--	1
Willacy, Texas	--	--	--	--	--	--	--	1	--	--	--	1	--	--	--	2
Kenedy, Texas	--	--	--	--	--	--	1	5	--	--	--	2	--	--	--	3
Kleberg, Texas	--	--	--	--	--	--	1	3	--	--	1	2	--	--	--	2
Nueces, Texas	--	--	--	--	--	--	--	2	--	--	1	2	--	--	--	3
Aransas, Texas	--	--	--	--	--	--	--	2	--	--	1	2	--	--	--	3
Calhoun, Texas	--	--	--	--	--	--	--	3	--	--	1	2	--	--	1	4
Matagorda, Texas	--	--	3	5	--	--	1	4	--	--	2	5	--	--	3	10
Brazoria, Texas	--	--	3	3	--	--	2	5	--	--	1	2	--	--	3	8
Galveston, Texas	--	--	3	5	--	--	2	3	--	--	1	2	--	--	2	5
Jefferson, Texas	--	--	4	5	--	--	1	1	--	--	--	--	--	--	1	2
Cameron, Louisiana	--	--	9	11	--	--	1	3	--	--	--	2	--	--	1	3
Vermilion, Louisiana	--	1	5	6	--	--	1	1	--	--	--	--	--	--	1	2
Iberia, Louisiana	--	1	3	3	--	--	--	--	--	--	--	--	--	--	--	1
St. Mary, Louisiana		--	1	1	--	--	--	--	--	--	--	--	--	--	--	--
Terrebonne, Louisiana	--	5	12	13	--	--	1	2	--	--	1	1	--	1	2	2
Lafourche, Louisiana	--	2	5	6	--	--	1	2	--	--	--	--	--	--	1	2
Jefferson, Louisiana	--	--	1	1	--	--	--	1	--	--	--	--	--	--	--	--
Plaquemines, Louisiana	--	3	10	10	--	--	2	3	--	--	--	--	--	--	2	2
St. Bernard, Louisiana	--	--	1	1	--	--	--	--	--	--	--	--	--	--	--	--
Baldwin, Alabama	--	--	1	1	--	--	--	--	--	--	--	--	--	--	--	--
Escambia, Florida	--	--	1	1	--	--	--	--	--	--	--	--	--	--	--	--
Okaloosa, Florida	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--
Bay, Florida	--	--	--	1	--	--	--	--	--	--	--	--	--	--	--	--
Miami-Dade, Florida	--	--	--	--	--	--	--	1	--	--	--	--	--	--	--	--
State Coastline	Conditional Probability of Contact (%)															
Texas	--	--	13	19	--	--	7	30	--	--	7	21	--	--	11	44
Louisiana	--	12	46	52	--	2	6	12	--	1	2	4	--	2	8	12
Mississippi	--	--	1	1	--	--	--	1	--	--	--	--	--	--	--	--
Alabama	--	--	1	1	--	--	--	--	--	--	--	--	--	--	--	--
Florida	--	--	2	5	--	--	--	2	--	--	--	--	--	--	--	1

From Launch Point 3, potential shoreline contacts within 60 days range from Cameron County, Texas, to Miami-Dade County, Florida. Based on statewide contact probabilities within 60 days, Texas has the highest likelihood of contact during summer, fall, and winter (ranging from 21% to 44% within 60 days), while Louisiana has the highest contact probability in spring (52% within 60 days). The model predicts potential contact with Mississippi shorelines during spring or summer with contact probabilities of 1% (within 60 days of a spill). Alabama shorelines are predicted to be potentially contacted only during spring with a contact probability of 1% within

60 days. Florida shorelines are predicted to be potentially contacted during all seasons except fall, with contact probabilities of up to 5% (during spring). Based on the 60-day trajectories, counties or parishes with a 10% or greater contact probability during any season include Matagorda County, Texas; and Cameron, Terrebonne, and Plaquemines parishes in Louisiana (**Table 4**).

OSRA is a preliminary risk assessment model. In the event of an actual oil 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 plume 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 major spill or uncontrolled release.

Weathering. In the event of a diesel fuel spill, it is expected that weathering and evaporation will occur quickly. The constituents of diesel fuel are light to intermediate in molecular weight and can be readily degraded by aerobic microbial oxidation. NOAA has reported that diesel fuel is readily and completely degraded by naturally occurring microbes (NOAA, 2023).

Weathering decreases the concentration of oil 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 a slick on the water surface. For example, the light, paraffinic crude oil spilled during the *Deepwater Horizon* incident lost approximately 55 wt. % to evaporation during the first 3 to 5 days while floating on the sea surface (Daling et al., 2014). Evaporated hydrocarbons are degraded rapidly by sunlight. Biodegradation of oil on the water surface and in the water column by marine bacteria removes first the n-alkanes and then the light aromatics from the oil. Other petroleum components are biodegraded more slowly (National Research Council, 2003a). Photo-oxidation attacks mainly the medium and high molecular weight PAHs in the oil on the water surface (Prince, 2014).

Spill Response. Anadarko's Regional OSRP was approved in August 2015 for Anadarko Petroleum Corporation and its subsidiary Anadarko US Offshore LLC. (Company Numbers 00981 and 02219, respectively) in accordance with 30 CFR Part 254. The 2025 OSRP biennial update was submitted on June 30, 2025 and was deemed in compliance as of October 14, 2025.

The OSRP provides a detailed plan that enables Anadarko to respond rapidly and effectively manage response efforts for oil spills that may result from drilling and production operations. The OSRP contains detailed information on "Quick Response" procedures, including:

- Responsibilities of all Anadarko and contract personnel to report any observed discharge from known or unknown sources;
- Procedures to locate and determine the size of a discharge; and
- Contact information for alerting the spill management team, complete with names, phone numbers, and locations.

In the event of a large oil spill up to and including a WCD, Anadarko has access to surface and subsea response/containment capabilities that could be implemented through various organizations under contract. Anadarko's primary spill response equipment provider is Clean Gulf Associates (CGA).

CGA has skimming vessels capable of operating in shallow waters, nearshore areas, and offshore areas. These vessels have oleophilic brush pack skimming systems operating in troughs built into the hulls; below-deck storage; and marine electronics packages including marine, aircraft, and company-frequency radios, radar, moving map plotters, GPS, satellite phones, and depth finders. CGA also offers Fast Response Systems staged throughout the Gulf of America available for offshore use.

The CGA high-volume open sea skimmer (HOSS) barge consists of a skimming system built into an oil recovery barge. There are 1,000-bbl recovered oil storage tanks built into the hull where oil can be separated and offloaded. Skimming operations are conducted from the control room overlooking the skimmer deck. The estimated daily recovery capacity for the HOSS barge is approximately 43,000 bbl of surface oil. CGA has recently acquired Koseq skimming arms and Aqua Guard skimmers to enhance its readiness. In addition, an x-band radar/infrared tracking system has been installed on the HOSS barge. Additional CGA equipment can be referenced online at http://www.cleangulfassoc.com/equipment.

Anadarko also has a contract with the Marine Spill Response Corporation (MSRC) for additional spill response equipment. MSRC has a dedicated fleet for the Atlantic/Gulf of America region and additional available equipment staged throughout the U.S. MSRC equipment staged throughout the Gulf of America includes oil spill response vessels, fast response vessels, oil spill response barges, platform supply vessels, and shallow water barges. Various equipment is outfitted with x-band radar and infrared technology for detecting surface oil. Additional MSRC capabilities and a complete equipment listing are available online at http://www.msrc.org/.

Anadarko is a member of the Marine Well Containment Company (MWCC). In the event of an incident, MWCC can provide a 15,000-psi single ram capping stack and dispersant injection capability. MWCC can install and operate the interim containment system, including subsea flowlines, manifolds, and risers. The interim system is engineered to be used in depths up to 10,000 ft (3,048 m) and has the capacity to contain 60,000 bbl of liquid per day (and 120 million standard cubic feet of gas per day) with potential for expansion.

Additionally, MWCC offers its members access to equipment, instruments, and supplies for marine environmental sampling and monitoring in the event of an oil spill in the Gulf of America. Members have access to a mobile Laboratory Container, Operations Container, and Launch and Recovery System that enable water sampling and monitoring to water depths of 9,843 ft (3,000 m). The two 8 ft × 20 ft (2.4 m × 6.1 m) containers have been certified for offshore use by Det Norske Veritas and the American Bureau of Shipping. The Launch and Recovery System is a combined winch, A-frame, and 9,843 ft (3,000 m) long cable, customized for the instruments in the containers.

The containers are designed to enable rapid mobilization of necessary equipment to an incident site, including redundant systems to avoid downtime and supplies for sample handling and storage. Once deployed on a suitable vessel, the mobile containers then act as workspaces for scientists and operations personnel. See EP Section H for a detailed description of Anadarko's site-specific spill response measures for the plan.

B. Affected Environment

The project area is approximately 119 mi (192 km) from the nearest shoreline (Louisiana), 132 mi (212 km) from the onshore support base at Port Fourchon, Louisiana, and 157 mi (253 km) from the helicopter base at Houma, Louisiana (**Figure 1**). The water depth at the location of the proposed activities ranges from approximately 4,652 to 5,405 ft (1,418 to 1,647 m) (**Figure 2**) (Ocean Geo Solutions, 2024; Xodus, 2026a,b,c,d,e,f).

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 recent EISs (BOEM, 2012a, 2013, 2014, 2015, 2016b, 2017a). These regional descriptions are applicable to the project area and 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**.

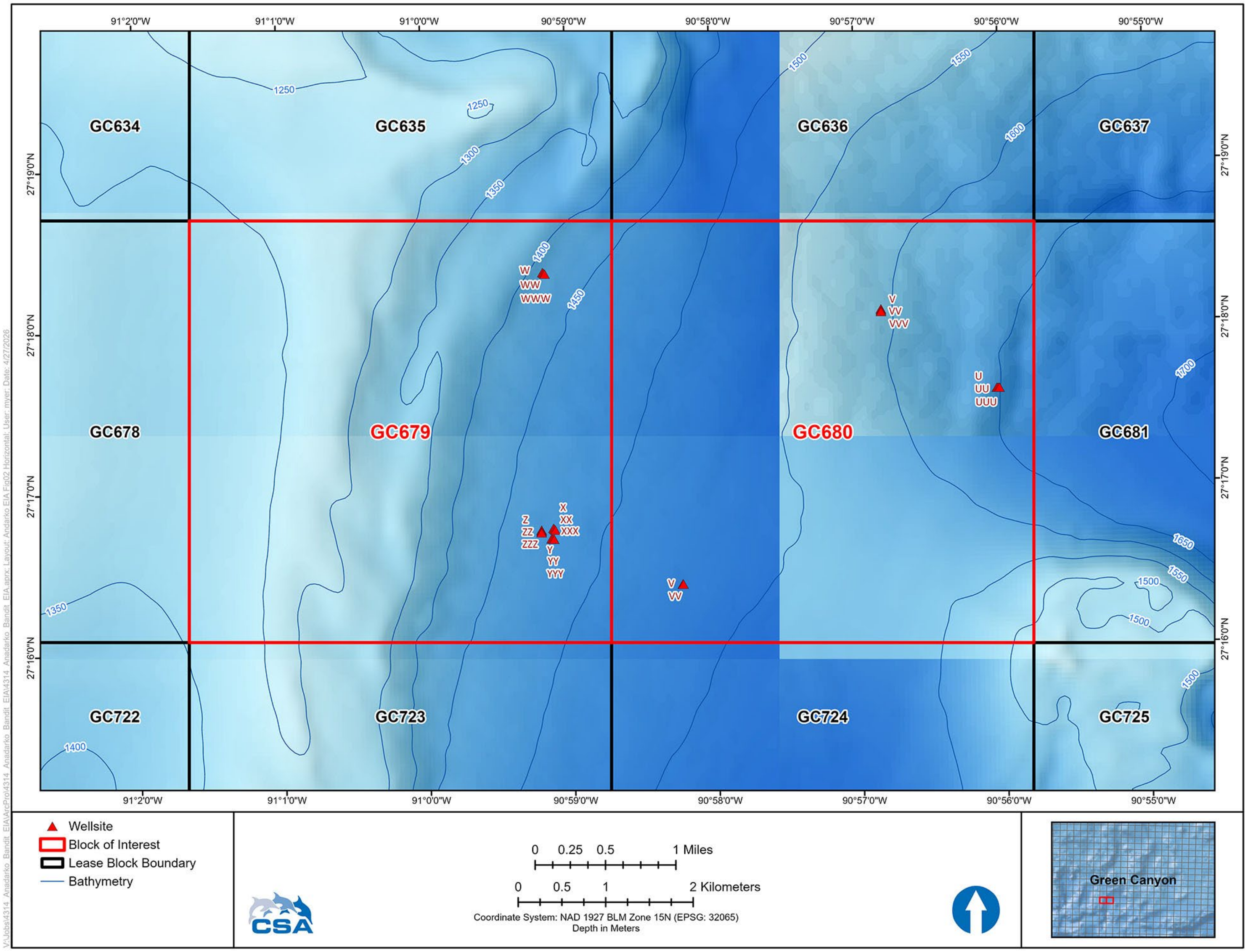

Figure 2. Bathymetric map of the project area showing the surface hole location of the wellsites in Green Canyon 679 and 680.

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 America Planning Areas (BOEM, 2013, 2014, 2015, 2016a, b, 2017a, 2025) and the information in these documents is incorporated by reference. This section is organized by the environmental resources identified in **Table 2** and addresses each IPF potentially affecting the resource.

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 minimal and highly dispersed sources offshore, air quality at the wellsite 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 America is relatively good (BOEM, 2012a). As of March 2026, Mississippi, Alabama, and Florida Panhandle coastal counties are in attainment of the National Ambient Air Quality Standards (NAAQS) for all criteria pollutants (USEPA, 2026). 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 (2015 Standard).

As noted previously, based on calculations made pursuant to applicable regulations, emissions from the project activities are not expected to be significant. Therefore, the only potential effects to air quality would be from air pollutant emissions associated with routine operations and accidental spills (a small fuel spill or a large oil spill). 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 will result primarily from installation operations and service vessels. 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 $PM_{2.5}$ and PM_{10}, ammonia, lead, 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 in Anadarko's proposed activities is not significant and is not expected to cause or contribute to a violation of NAAQS.

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, 2022). 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 America and are not expected to significantly alter or exceed any of the climate change impacts evaluated in the Programmatic EIS (BOEM, 2016a). Carbon dioxide and methane 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, 2023a, 2017a), estimated carbon dioxide 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), emissions of air pollutants from routine activities in the Central Gulf of America Planning Area are projected to have minimal impacts to onshore air quality because of the prevailing atmospheric conditions, emission rates, and the distance of these emissions from the coastline. The Air Quality Emissions Report (see EP Section G) indicates that the projected 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 mi (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 181 mi (291 km) from the Breton Wilderness Area. Anadarko intends to comply with all BOEM requirements regarding air emissions.

There are three Class I air quality areas on the west coast of Florida: St. Marks National Wildlife Refuge in Wakulla County, Florida, Chassahowitzka National Wildlife Refuge in Hernando County, Florida, and Everglades National Park in Monroe, Miami-Dade, and Collier counties, Florida. The project area is approximately 434 mi (698 km) from the closest Florida Class I air quality area (St. Marks National Wildlife Refuge Class I Air Quality Area). Anadarko will comply with emissions requirements as directed by BOEM. No further analysis or control measures are required.

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, 2025). The probability of a small spill would be minimized by Anadarko's preventative measures during routine operations, including fuel transfer. In the unlikely event of a spill, implementation of Anadarko's OSRP is expected to reduce the potential impacts. EP Section H includes a detailed discussion of the spill response measures that would be employed. 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 WebGNOME model (see **Section A.9.1**) indicates that over 90% of a small diesel spill would be evaporated or dispersed within 24 hours

(NOAA, 2022a). 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 dissipating (see **Section A.9.1**).

Impacts of a Large Oil Spill

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

A large oil spill could potentially affect air quality by introducing VOCs into the atmosphere through evaporation. The extent and persistence of impacts would depend on the meteorological and oceanographic conditions at the time of the spill 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 VOCs released. Additional air quality impacts could occur if response measures included in-situ burning of floating oil. Burning would generate a plume of black smoke and result in emissions of NO_x, SO_x, CO, and PM as well as greenhouse gases. However, in-situ burning would occur only after authorization from the USCG Federal On-Scene Coordinator. This approval would also be based upon consultation with the regional response team, including the USEPA.

Because of the project area's location (119 mi [192 km]) from the nearest shoreline, most air quality impacts would occur in offshore waters with minimal chance to affect onshore air quality.

C.1.2 Water Quality

There are no site-specific baseline water quality data for the project area. Deepwater areas in the northern Gulf of America 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 America, there are localized areas (termed natural seeps) that release oil, gas, and brines from sub-surface deposits into near surface sediments and up through the water column. No natural seeps were noted within 2,000 ft (610 m) of the proposed activities (Ocean Geo Solutions, 2024; Xodus, 2026a,b,c,d,e,f).

The only 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 oil 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 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 curbs, gutters, and drains (including drip pans) in work areas. Rainwater that falls on uncontaminated areas of the drilling rig will flow overboard without treatment. However, rainwater that falls on the other 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 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, non-pollutant completion/recompletion fluids, uncontaminated ballast and bilge water, non-contact cooling water, subsea production control fluid, produced water, and fire water 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 to be in accordance with USCG and the MARPOL 73/78 Annex V requirements 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). The probability of a small spill would be minimized by Anadarko's preventative measures during routine operations, including fuel transfer. In the unlikely event of a spill, implementation of Anadarko's OSRP is expected to potentially help mitigate and reduce the impacts. EP Section H provides details on spill response measures in addition to the summary information provided in the EIA.

The water-soluble fractions of diesel are dominated by two- and three-ringed PAHs, which are moderately volatile (National Research Council, 2003a). The molecular weight of diesel fuel constituents is light to intermediate and can be readily degraded by aerobic microbial oxidation. Diesel fuel 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 fuel 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 fuel 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, 2023). It is possible for the diesel fuel that is dispersed by wave action to form droplets that are small enough to be kept in suspension and be moved by the currents.

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

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 of the spill and the effectiveness of spill response measures. It is estimated that more than 90% of a small diesel spill would evaporate or disperse within 24 hours (NOAA, 2022a) (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 fuel are readily and completely degraded by naturally occurring microbes (NOAA, 2023). 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 Oil Spill

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

Most of the spilled oil would be expected to form a slick at the surface, although information from the *Deepwater Horizon* incident indicates that submerged oil droplets can be produced when subsea dispersants are applied at the wellhead (Camilli et al., 2010; Hazen et al., 2010; NOAA, 2011a,b,c). Dispersants would be applied only after approval from the Federal On-Scene Coordinator with collaboration from the USEPA and Regional Response Team Region 6.

The extent and persistence of impacts would depend on the meteorological and oceanographic conditions at the time of the release 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 hydrocarbons. Weathering processes that affect spilled oil on the sea include adsorption (sedimentation), biodegradation, dispersion, dissolution, emulsification, evaporation, and photo oxidation. Most crude oil blends will emulsify quickly when spilled, creating a stable mousse that presents a more persistent cleanup and removal challenge (NOAA, 2024).

Hazen et al. (2010) studied the impacts and fate of oil released in the deepwater environment after the 2010 *Deepwater Horizon* incident. Initial studies suggested that the potential exists for rapid intrinsic bioremediation (bacterial degradation) of subsea dispersed oil in the water column by deep-sea indigenous microbial activity without significant oxygen depletion (Hazen et al., 2010), although other studies showed that oil bioremediation caused oxygen drawdown in deep waters (Kessler et al., 2011; Dubinsky et al., 2013). Additional studies investigated the effects of deepwater dissolved hydrocarbon gases (e.g., methane, propane, ethane) and the microbial response to a deepwater oil suggest that deepwater dissolved hydrocarbon gases may promote rapid hydrocarbon respiration by low-diversity bacterial blooms, thus priming indigenous bacterial populations for rapid hydrocarbon degradation of subsea oil (Kessler et al., 2011; Du and Kessler, 2012; Valentine et al., 2014). A 2017 study identified water temperature, taxonomic composition of initial bacterial community, and dissolved nutrient levels as factors that may regulate oil degradation rates by deep-sea indigenous microbes (Liu et al., 2017).

Due to the project area being located approximately 119 mi (192 km) from the nearest shoreline (Louisiana), it is expected that most water quality impacts would occur in offshore waters before low molecular weight alkanes and volatiles are weathered (Operational Science Advisory Team, 2011), especially in the event of a spill lasting less than 30 days. The 30-day OSRA modeling (**Table 3**) indicates that Cameron Parish in Louisiana is the coastal area most likely to be affected (4% probability within 30 days). Within 30 days, shoreline segments of six Louisiana parishes and five Texas counties have a probability of 1% to 4% of being contacted. Based on the 60-day OSRA modeling estimates (**Table 4**), there is potential for contact of shorelines between

Cameron County, Texas, and Miami-Dade County, Florida, with a maximum conditional probability of contact of 13% in Terrebonne Parish, Louisiana.

C.2 Seafloor Habitats and Biota

The water depth at the location of the proposed activities ranges from approximately 4,652 to 5,405 ft (1,418 to 1,647 m). According to BOEM (2023a), existing information for the deepwater Gulf of America indicates that the seafloor is composed primarily of soft sediments; exposed hard substrate habitats and associated biological communities are rare. The site clearance letters did not note the presence of deepwater benthic communities within 2,000 ft (610 m) of the location of the proposed activities (Ocean Geo Solutions, 2014; Xodus, 2026a,b,c,d,e,f). The IPFs with potential impacts listed in **Table 2** are discussed below.

C.2.1 Soft Bottom Benthic Communities

There is 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 5** summarizes data collected at two stations in water depths similar to those in the project area.

Table 5. Baseline benthic community data from stations 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 (m)	Density		
		Meiofauna (>63 µm; individuals m^{-2})	Macroinfauna (>300 mm; individuals m^{-2})	Megafauna (>1 cm; individuals ha^{-1})
WC12	1,175	218,447	1,787	2,941
NB3	1,875	165,245	1,342	191

Meiofaunal and megafaunal abundances from Rowe and Kennicutt (2009); macroinfaunal abundance from Wei (2006); m = meter; ha = hectare.

Densities of meiofauna (animals passing through a 0.5-mm sieve but retained on a 0.062-mm sieve) at stations in similar depths of the project area ranged from approximately 165,000 to 218,000 individuals m^{-2} (**Table 5**) (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 America continental slope (Wei, 2006). Densities decrease exponentially with water depth. Based on an extrapolation equation presented by Wei (2006), macroinfaunal densities in the water depth of the project area are expected to range from approximately 1,300 to 1,700 individuals m^{-2}.

Polychaetes are typically the most abundant macroinfaunal group on the northern Gulf of America 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 America when compared to the eastern and western regions. Wei (2006) recognized four depth-dependent faunal zones (1 through 4), two of which are divided into eastern and western subzones.

The lease area is located in Zone 3W The most abundant species in Zone 3W were the polychaetes *Levinsenia uncinata*, *Paraonella monilaris*, and *Tachytrypane* spp.; the bivalve *Heterodonta* spp; and the isopod *Macrostylis* sp. (Wei, 2006).

The megafaunal density at nearby stations in the vicinity of the project area ranged between 191 and 2,941 individuals ha^{-1}. Common megafauna included motile groups such as echinoderms, cnidarians (sessile sea anemones, pens and whips), decapod crustaceans, and demersal fish (Rowe and Kennicutt, 2009).

Bacteria also 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 physical disturbance to the seafloor and potential effects from large oil spill resulting from a well blowout at the seafloor. A small fuel spill 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

In water depths such as those in the project area, DP drilling rigs disturb the seafloor only around the location where drilling occurs and equipment will be placed on the seafloor.

The areal extent of these impacts is expected to be small compared to the project area itself, and these types of soft bottom communities are ubiquitous along the northern Gulf of America 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 to be localized and will not likely have a significant impact on soft bottom benthic communities in the region.

Impacts of a Large Oil Spill

The most likely effects of a subsea blowout on benthic communities would be within a few hundred meters of the wellsite. BOEM (2012a) estimated that a severe subsurface blowout could resuspend and disperse sediments within a 984 ft (300 m) radius. While coarse sediments (sands) would probably settle at a rapid rate within 1,312-ft (400 m) from the blowout site, fine sediments (silts and clays) could be resuspended for more than 30 days and dispersed over a wider area. Based on previous studies, surface sediments at the project area are assumed to largely be silt and clay (Rowe and Kennicutt, 2009).

While impacts from a large oil spill are anticipated to be confined to the immediate vicinity of the wellhead, depending on the specific circumstances of the incident, additional benthic community impacts could extend beyond the immediate vicinity of the wellhead (BOEM, 2017a). During the *Deepwater Horizon* incident, subsurface oil plumes were reported in water depths of approximately 3,600 ft (1,100 m), extending at least 22 mi (35 km) from the wellsite and persisting for more than a month (Camilli et al., 2010). Noirungsee et al. (2020)

observed that pressure has a significant influence on deep-sea sediment microbial communities with the addition of dispersant and oil with dispersants being shown to have an inhibitory effect on hydrocarbon degraders. Thus, the dispersant persistence due to hydrostatic pressure could further limit microbial oil biodegradation (Noirungsee et al., 2020).

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, including deepwater coral-dominated communities. Chemosynthetic communities were discovered in the central Gulf of America in 1984 and have been studied extensively (MacDonald, 2002). Deepwater coral communities are also known from numerous locations in the Gulf of America (Brooke and Schroeder, 2007; CSA International, 2007; Brooks et al., 2012). In the Gulf of America, deepwater coral communities occur almost exclusively on exposed authigenic carbonate rock created by a biogeochemical (microbial) process.

In water depths such as those encountered in the project area, DP drilling rigs disturb the seafloor only the location where equipment will be placed on the seafloor.

The site clearance letters did not identify any features that could support high-density deepwater benthic communities within 2,000 ft (610 m) of the proposed project location (Ocean Geo Solutions, 2024; Xodus, 2026a,b,c,d,e,f). The nearest known high-density deepwater benthic community is located in Green Canyon Block 852, approximately 14 mi (23 km) from the project area. Due to the distance from the project area, it is unlikely that these communities will be affected by routine operations.

The only IPF identified for this project that could affect high-density deepwater benthic communities is a large oil spill from a well blowout at the seafloor. A small fuel spill would not affect benthic communities because the diesel fuel would float and dissipate on the sea surface. Physical disturbance and effluent discharge are not considered IPFs for deepwater benthic communities because these communities are not expected to be present down current in the close vicinity of the proposed activities.

Impacts of a Large Oil Spill

A large oil spill caused by a seafloor blowout could cause direct impacts (i.e., caused by the physical impacts of a blowout) on benthic communities within approximately 984 ft (300 m) of the wellhead (BOEM, 2012a, 2013). Additional benthic community impacts could extend beyond the immediate vicinity of the wellhead, depending on the specific circumstances (BOEM, 2017a). During the *Deepwater Horizon* spill, subsurface plumes were reported at a water depth of approximately 3,600 ft (1,100 m), extending at least 22 mi (35 km) from the wellsite and persisting for more than a month (Camilli et al., 2010). Oil plumes that contact sensitive benthic communities before degrading could potentially impact the resource (BOEM, 2017a). Potential impacts on sensitive resources would be an integral part of the decision and approval process for the use of dispersants, and such approval would be obtained from the Federal On-Scene Coordinator prior to the use of dispersants.

The biological effects and fate of the oil remaining in the Gulf of America from the *Deepwater Horizon* incident are still being studied, but numerous papers have been published discussing the nature of subsea oil plumes (e.g., Ramseur, 2010; Reddy et al., 2012; Valentine et al., 2014). Hazen et al. (2010) reported changes in plume hydrocarbon composition with distance from the source. Incubation experiments with environmental isolates demonstrated faster than expected hydrocarbon biodegradation rates at 5°C (41°F). Based on these results, Hazen et al. (2010) suggested the potential exists for intrinsic bioremediation of the oil plume in the deepwater column without substantial oxygen drawdown.

Potential impacts of oil on high-density deepwater benthic communities are discussed in recent EISs (BOEM, 2012a, 2015, 2016b, 2017a). Oil droplets or oiled sediment particles could come into contact with chemosynthetic organisms or deepwater corals in the vicinity of the spill site. Impacts could include loss of habitat, biodiversity, and live coral coverage; destruction of hard substrate; reduction or loss of one or more commercial and recreational fishery habitats; or changes in sediment characteristics (BOEM, 2012a, 2017a).

C.2.3 Designated Topographic Features

GC 679 and 680 are 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 48 mi (77 km) from 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 an oil spill from a well blowout, a surface slick would not contact these seafloor features. If a subsurface plume were to occur, impacts on these features would be unlikely due to the distance and the difference in water depth. Near-bottom currents in the region are predicted to flow along the isobaths (Nowlin et al., 2001) and typically would not carry a plume upward onto the continental shelf edge where the designated topographic features are located.

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 199 mi (320 km) from 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 an oil spill from a well blowout, a surface slick would not contact these seafloor features. If a subsurface plume were to occur, impacts on these features would be unlikely due to the distance and the difference in water depth. Near-bottom currents in the region are predicted to flow along the isobaths (Nowlin et al., 2001) and typically would not carry a plume upward onto the continental shelf edge where the Pinnacle Trend Area Live Bottoms are located.

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 America Planning Area leases in water depths of 328 ft (100 m) or less and portions of Pensacola and Destin Dome Area blocks in the Central Gulf of America Planning Area. The nearest block covered by the Live Bottom Stipulation, as defined by NTL 2009-G39, is located approximately 239 mi (385 km) from 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 an oil spill from a well blowout, a surface slick would not contact these seafloor features. If a subsurface plume were to occur, impacts on these features would be unlikely due to the distance and the difference in water depth. Near-bottom currents in the region are predicted to flow along the isobaths (Nowlin et al., 2001) and typically would not carry a plume upward onto the continental shelf.

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 6**. The table also indicates the location of critical habitat (if designated in the Gulf of America). 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 NMFS has jurisdiction for ESA-listed marine mammals (cetaceans), sea turtles, and fishes in the Gulf of America. The USFWS has jurisdiction for ESA-listed birds, the West Indian manatee (*Trichechus manatus*), 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 (*Charadrius melodus*), Rufa Red Knot (*Calidris canutus rufa),* Florida salt marsh vole (*Microtus pennsylvanicus dukecampbelli*), Panama City crayfish (*Procambarus econfinae*), Whooping Crane (*Grus americana*), Gulf sturgeon (*Acipenser oxyrinchus desotoi*), smalltooth sawfish (*Pristis pectinata*), queen conch (*Aliger gigas*) and four subspecies of beach mouse. Critical habitat has been designated for all of these species (except the Florida salt marsh vole, Rufa Red Knot, and queen conch) as indicated in **Table 6** and discussed in individual sections.

Table 6. Federally listed Endangered and Threatened species potentially occurring in the project area and along the northern Gulf Coast. Adapted from: U.S. Fish and Wildlife Service (2025) and National and Oceanic Atmospheric Administration Fisheries (2025).

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in Gulf of America
			Project Area	Coastal	
Marine Mammals					
Rice's whale	*Balaenoptera ricei*	E	X	--	None
Sperm whale	*Physeter macrocephalus*	E	X	--	None
West Indian manatee	*Trichechus manatus*[1]	T	--	X	Florida (Peninsular)
Sea Turtles					
Loggerhead turtle	*Caretta caretta*	T,E[2]	X	X	Nesting beaches and nearshore reproductive habitat in Mississippi, Alabama, and Florida (Panhandle); *Sargassum* habitat including most of the central & western Gulf of America
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 (Panhandle)
Whooping Crane	*Grus americana*	E	--	X	Coastal Texas (Aransas National Wildlife Refuge)
Black-capped Petrel	*Pterodroma hasitata*	E	X	--	None
Rufa Red Knot	*Calidris canutus rufa*	T	--	X	None
Fishes					
Oceanic whitetip shark	*Carcharhinus longimanus*	T	X	--	None
Giant manta ray	*Mobula birostris*	T	X	X	None
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	T	--	X	Coastal Louisiana, Mississippi, Alabama, and Florida (Panhandle)
Nassau grouper	*Epinephelus striatus*	T	--	X	None
Smalltooth sawfish	*Pristis pectinata*	E	--	X	Southwest Florida
Invertebrates					
Elkhorn coral	*Acropora palmata*	T	--	X	Florida Keys and the Dry Tortugas
Staghorn coral	*Acropora cervicornis*	T	--	X	Florida Keys and the Dry Tortugas
Pillar coral	*Dendrogyra cylindrus*	T	--	X	Southeast Florida and Florida Keys, Puerto Rico, St. Thomas, St. John, St. Croix, and Navassa Island
Rough cactus coral	*Mycetophyllia ferox*	T	--	X	Southeast Florida and Florida Keys, Puerto Rico, St. Thomas, St. John, St. Croix, and Navassa Island

Table 6. (Continued).

Species	Scientific Name	Status	Potential Presence		Critical Habitat Designated in Gulf of America
			Project Area	Coastal	
Lobed star coral	*Orbicella annularis*	T	--	X	Southeast Florida and Florida Keys, Puerto Rico, St. Thomas, St. John, St. Croix, Navassa Island, East and West Flower Garden Banks, Rankin Bright Bank, Geyer Bank, and McGrail Bank
Invertebrates					
Mountainous star coral	*Orbicella faveolata*	T	--	X	Southeast Florida and Florida Keys, Puerto Rico, St. Thomas, St. John, St. Croix, Navassa Island, East and West Flower Garden Banks, Rankin Bright Bank, Geyer Bank, and McGrail Bank
Boulder star coral	*Orbicella franksi*	T	--	X	Southeast Florida and Florida Keys, Puerto Rico, St. Thomas, St. John, St. Croix, Navassa Island, East and West Flower Garden Banks, Rankin Bright Bank, Geyer Bank, and McGrail Bank
Panama City crayfish	*Procambarus econfinae*	T	--	X	South-central Bay County, Florida
Queen conch	*Aliger gigas*	T	--	X	None
Terrestrial Mammals					
Beach mice (Alabama, Choctawhatchee, Perdido Key, St. Andrew)	*Peromyscus polionotus*	E	--	X	Alabama and Florida (Panhandle) beaches
Florida salt marsh vole	*Microtus pennsylvanicus dukecampbelli*	E	--	X	None

E = Endangered; T = Threatened; X = potentially present; -- = not present.

[1.] There are two subspecies of West Indian manatee: the Florida manatee (*T. m. latirostris*), which ranges from the northern Gulf of America 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 America. On 30 March 2017, the USFWS announced the West Indian manatee, including the Florida manatee subspecies, was reclassified as Threatened.

[2.] 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).

The sperm whale (*Physeter macrocephalus*), the Rice's whale (*Balaenoptera ricei*), five species of sea turtles, the Black-capped Petrel (*Pteredroma hasitata*), the oceanic whitetip shark (*Carcharhinus longimanus*) and the giant manta ray (*Mobula birostris*) are the only Endangered or Threatened species likely to occur in or near the project area. The listed sea turtles include the leatherback turtle (*Dermochelys coriacea*), Kemp's ridley turtle (*Lepidochelys kempii*), hawksbill turtle (*Eretmochelys imbricata*), loggerhead turtle (*Caretta caretta*), and green turtle (*Chelonia mydas*) (Pritchard, 1997). Effective 11 August 2014, NMFS designated certain marine areas as critical habitat for the Northwest Atlantic Distinct Population Segment (DPS) of the loggerhead sea turtle (see **Section C.3.5**). No critical habitat has been designated in the Gulf of America for the leatherback turtle, Kemp's ridley turtle, hawksbill turtle, green turtle, or the sperm whale. Five Endangered mysticetes (blue whale [*Balaenoptera musculus]*, fin whale [*B. physalus]*, humpback whale [*Megaptera novaeangliae]*, North Atlantic right whale [*Eubalaena glacialis]*, and sei whale [*B. borealis]*) have been reported in the Gulf of America, but are considered rare or extralimital (Würsig et al., 2000; Hayes et al., 2020, 2022, 2024). There is no Northern Gulf of Mexico stock designated by NMFS for these species, and the most recent NMFS stock assessment reports (Hayes et al., 2020, 2022, 2024) do not list their ranges as including the Gulf of America. They are also not included in the most recent BOEM multisale EIS (BOEM, 2017a); therefore, they are not considered further in the EIA.

The Rice's whale (*B. ricei*) exists in the Gulf of America as a small, resident population. This species was formally known as a subspecies to the Bryde's whale (*B. edeni brydei*) until a DNA study identified it as a separate species (Rosel et al., 2021). It is the only baleen whale known to be resident in the Gulf of America. The species is restricted in range, being primarily found in the northeastern Gulf in the waters of the DeSoto Canyon (Waring et al., 2016; Rosel et al., 2021) with some detections also occurring along the OCS between the 100-m (328-ft) to 400-m (1,312 ft) isobaths (see **Section C.3.2**).

In several acoustic studies in the Gulf of America (Soldevilla et al., 2022a,b; 2024), all Bryde's whale complex individuals are assumed to be Rice's whales. However, Bryde's whales have a global tropical and subtropical range that can include the Gulf of America. Moreover, in the NMFS Rice's whale Marine Mammal Stock Assessment Report (Hayes et al., 2023), all previous data of Gulf of America Bryde's whales from studies that pre-dated the Rosel et al. (2021) study that determined that Rice's whales are a distinct species were now assumed to all be Rice's whales. However, it is unclear on what percentage of Bryde's whale complex individuals that live or previously lived in Gulf of America are Rice's whales vs Bryde's whales due to having no DNA studies that analyzed a representative population of Gulf of America Bryde's whale complex individuals.

The Marine Mammal Protected Areas Task Force has designated three Important Marine Mammal Areas (IMMAs) which overlap with the project area: the Gulf of Mexico Outer Continental Shelf and Continental Slope IMMA, the Northern Gulf of Mexico Bays, Sounds and Estuaries IMMA, and the Texas Coastal Bend IMMA (Marine Mammal Protected Areas Task Force, 2025a,b,c). The Gulf of Mexico Outer Continental Shelf and Continental Slope IMMA extend over the whole basin (both within and outside the Gulf of America encompassed in the U.S. EEZ) and covers the portion of the outer continental shelf and slope between 100 and 2,000 m depth and the portion of the abyssal plain between 2,000 and 2,500 m depth. This IMMA was identified as important habitat for Rice's whales and sperm whales residing in the Gulf of Mexico, as well as an area of high diversity of other cetacean species (e.g., beaked whales [*Ziphius cavirostris, Mesoplodon* spp.], short-finned pilot whales [*Globicephala macrorhynchus*], Risso's dolphins [*Grampus griseus*]) (Marine Mammal Protected Areas Task Force, 2025a). The other two IMMAs cover coastal bays and estuaries which host smaller resident populations of bottlenose dolphins (*Tursiops truncatus*) (Marine Mammal Protected Areas Task Force, 2025b,c).

The giant manta ray could occur in the project area but is most commonly observed in the Gulf of America at the Flower Garden Banks. The Nassau grouper (*Epinephelus striatus*) has been observed in the Gulf of America at the Flower Garden Banks but is most commonly observed in shallow tropical reefs of the Caribbean and is not expected to occur in the project area. The smalltooth sawfish is a coastal species limited to shallow areas off the west coast of Florida and is not expected to occur in the project area.

Seven Threatened coral species are known from the northern Gulf of America: elkhorn coral (*Acropora palmata*), staghorn coral (*A. cervicornis*), lobed star coral (*Orbicella annularis*), mountainous star coral (*O. faveolata*), boulder star coral (*O. franksi*), pillar coral (*Dendrogyra cylindrus*), and rough cactus coral (*Mycetophyllia ferox*). None of these species are expected to be present in the project area (**Section C.3.16**). These corals are shallow water, zooxanthellate species (containing symbiotic photosynthetic zooxanthellae which contribute to their nutritional needs) and will not present in the deepwater project area (see **Section C.3.16**). Critical habitat for lobed star coral, mountainous star coral, boulder star coral, rough cactus coral, and pillar coral was designated by NMFS in August 2023 (**Table 6**; 88 FR 54026).

There are no other Threatened or Endangered species in the Gulf of America that are likely to be adversely affected by either routine or accidental events. The IPFs with potential impacts listed in **Table 2** are discussed below.

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. Resident populations of sperm whales occur within the Gulf of America; a species description is presented in the recovery plan for this species (NMFS, 2010). Gulf of America 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 (Hayes et al., 2021). 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
- Is listed as a Threatened or Endangered species under the ESA or is designated as depleted under the MMPA.

Current threats to sperm whale populations are defined as "any factor that could represent an impediment to recovery." Current threats to sperm whale populations worldwide include fisheries interactions, anthropogenic underwater 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 America, the impacts from many of these threats are identified as either low or unknown (BOEM, 2012a).

The distribution of sperm whales in the Gulf of America 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 America are present throughout the year (Davis et al., 2000). 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 >3,000 m (9,843 ft). Generally, groups of sperm whales observed in the Gulf of America during the MMS-funded Sperm Whale Seismic Study (SWSS) consisted 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 protected species observer (PSO) sighting reports from seismic mitigation surveys in the Gulf of America 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. Tagging and observation data from the SWSS 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 America population (within the 95% utilization distribution) (Jochens et al., 2008).

IPFs that may potentially affect sperm whales include drilling rig presence, underwater sound, and lights; support vessel and helicopter traffic; and two types of accidents (a small fuel spill and a large oil 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 intended to minimize the potential for marine debris-related impacts on sperm whales.

Though NMFS (2025a) stated marine debris as an IPF, compliance with BSEE NTL 2015-G03 and NMFS (2025a) Attachment 2 will minimize the potential for marine debris-related impacts on sperm whales. NMFS (2025a) estimates that no more than three sperm whales will be non-lethally taken, with one sperm whale lethally taken through the ingestion of marine debris over 45 years of proposed action. Therefore, marine debris is likely to have negligible impacts on sperm whales and is not discussed further (see **Table 2**).

Impacts Drilling Rig Presence, Underwater Sound, and Lights

Sound from routine installation activities (see **Section A.1**) has the potential to disturb individuals or groups of sperm whales or mask the sounds they would normally produce or hear. Behavioral responses to underwater sound 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; Southall et al., 2021). 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 sound was found to result in a reduced number of whale calls in the Gulf of America (Azzara et al., 2013).

NMFS (2024) lists sperm whales in the same functional hearing group (i.e., high-frequency cetaceans) as most dolphins and other toothed whales (i.e., odontocetes), with an estimated hearing sensitivity from 150 Hz to 160 kHz. Therefore, vessel-related sound is likely to be audible to sperm whales. The sperm whale may possess better hearing at lower frequencies than some of the other high-frequency cetacean species, although not as low as many baleen whale species that primarily produce sounds between 12 Hz and 28 kHz (Wartzok and Ketten, 1999; Southall et al., 2019). Generally, most of the acoustic energy produced by sperm whales is present at frequencies below 10 kHz, although diffuse energy up to and past 20 kHz is common, with SLs, expressed as SPL, up to 236 dB re1 µPa m (Møhl et al., 2003).

Observations of sperm whales near offshore oil and gas operations suggest an inconsistent response to anthropogenic underwater sound (Jochens et al., 2008). Most observations of behavioral responses of marine mammals to non-impulsive sources such as drilling sound, in general, involve short-term behavioral responses, which included onset of avoidance behavior and the cessation of feeding, resting, or social interactions (NMFS, 2010; Southall et al., 2021). Animals can determine the direction from which underwater 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 ability to avoid sound sources (National Research Council, 2003b).

NMFS (2024) presents criteria that may be used to determine auditory injury and temporary threshold shifts (TTS) thresholds for marine mammals. Behavioral disturbance thresholds have not been updated in the most recent acoustic guidance (NMFS, 2024) and therefore, this assessment refers to thresholds published by NMFS in FR 70(7): 1871-1875 (NMFS and NOAA, 2005) and summarized in NMFS (2025b). For high-frequency cetaceans exposed to non-impulsive sources (which include the proposed drilling activities), auditory injury is estimated to occur when the animal has received a sound exposure level over 24 hours (SEL_{24h}) of 201 dB re 1 µPa^2 s. Similarly, TTS is estimated to occur when the animal has received an SEL_{24h} of 181 dB re 1 µPa^2 s. Given the non-impulsive nature of drilling activities and the estimated source levels (**Section A.1**), sperm whales are unlikely to be exposed to sound above the auditory injury threshold. While sound during installation operations may exceed the TTS threshold, it is expected that, due to the relatively stationary nature of these vessels, sperm whales would move away from the proposed operations area, reducing the duration that individuals are exposed to sound, further reducing the likelihood of TTS being realized. Therefore, due to transient nature of sperm whales and the stationary nature of drilling activities, it is not expected that any sperm whales will remain in proximity to the source for a full 24-hour period to receive an SEL_{24h} necessary for the onset of auditory threshold shifts.

Underwater sound associated with proposed drilling operations may cause behavioral disturbance effects to sperm whales. Behavioral disturbance thresholds for marine mammals are applied equally across all functional hearing groups. Received SPL of 120 dB re 1 µPa from a continuous source (applicable to the proposed installation operations) is considered high enough to elicit the onset of a behavioral reaction in some marine mammal species (NMFS, 2025b). Based on the estimated source levels provided in **Section A.1**, the maximum estimated source level of 195 dB re 1 µPa m for sound produced by project operations may exceed the behavioral disturbance threshold out to 3.5 mi (5.6 km). However, in the case of behavioral responses, exposure to above-threshold sound levels alone does not indicate a behavioral response and, more importantly, does not equate to biologically important responses (Southall et al., 2016, 2021; Ellison et al., 2012).

There are other OCS facilities and activities near the project area, and the region as a whole has a large number of similar underwater sound sources (HDR [Athens, AL], 2022). Drilling-related underwater sound associated with this project may contribute to increases in the underwater sound environment within the region, but it is not expected to be at amplitudes above ambient sound conditions sufficient enough to result in long-term behavioral effects to sperm whales. The proposed activities may cause behavioral effects, primarily avoidance or temporary displacement from the project area, but are not expected to be biologically significant for the population. Vessel lighting and presence are not expected to impact sperm whales (NMFS, 2007; BOEM, 2016a; 2017) and therefore, are not identified as IPFs.

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. This NTL was reissued in June 2020 to address instances where guidance in the 2020 NMFS Biological Opinion (NMFS, 2020a) replaces compliance with the NTL as well as the amendment in April 2021 (NMFS, 2021); a new NTL in response to the 2025 Biological Opinion has not yet been issued. However, Anadarko intends to follow the mitigation measures summarized in Attachment 3 of the 2025 Biological Opinion (NMFS, 2025a).

Vessel operators are required to reduce vessel speed to 10 knots or less, as safety permits, when mother/calf pairs, pods, or large assemblages of cetaceans are observed near an underway vessel (NTL BOEM-2016-G01). When sperm whales are sighted while a vessel is underway, the vessel should take action (e.g., attempt to remain parallel to the whale's course, avoid excessive speed or abrupt changes in direction until the whale has left the area) as necessary to avoid violating the relevant separation distance. However, if the sperm whale is sighted within this distance, the vessel should reduce speed and shift the engine to neutral and not re-engage until the whale is outside of the separation area. This does not apply to any vessel towing gear (NMFS [2025a] Attachment 1). Compliance with these mitigation measures will minimize the likelihood of vessel collisions as well as reduce the chance for disturbing sperm whales. However, this mitigation is effective only during daylight hours and during periods of adequate visibility.

NMFS (2025a) analyzed the potential for vessel collisions and harassment of sperm whales in its Biological Opinion on the Federally Regulated Oil and Gas Program Activities in the Gulf of Mexico. 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 level of the population. With the implementation of the NMFS vessel collision protocols listed in Attachment 3 of NMFS (2025a) in addition to the NTL BOEM-2016-G01, NMFS (2025a) concluded that the likelihood of collisions between vessels and sperm whales would be reduced during daylight hours. During nighttime and during periods of poor visibility, it is assumed that vessel sound and sperm whale avoidance of moving vessels would reduce the chance of vessel collisions with this species. It is, however, likely that a collision between a sperm whale and a moving support vessel would result in severe injury or mortality of the stricken animal. The current PBR level for the Gulf of America stock of sperm whales is 2.0 (Hayes et al., 2022). The PBR level is defined by the MMPA as the maximum number of animals, not including natural mortalities, that may be removed from a marine mammal stock while allowing that stock to reach or maintain its optimum sustainable population. NMFS (2025a) estimated that there would be 4 non-lethal takes and 12 lethal vessel strikes over the course of 45 years. Mortality of a single sperm whale would constitute a significant impact to the local (Gulf of America) stock of sperm whales but would not likely be significant at the species level.

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 800 ft (245 m). A reaction to the initial pass of the aircraft was observed during 3 of 24 (12%) sightings. All three responses consisted of a hasty dive and occurred at less than 1,180 ft (360 m) 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, the authors 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 America, support helicopters maintain altitudes above 700 ft (213 m) during transit to and from the working area. In the event that a whale is observed during transit, the helicopter will not approach or circle the animals. Although responses are possible (Smultea et al., 2008), NMFS (2025a) concluded that this altitude would minimize the potential for disturbing sperm whales. Therefore, no significant impacts are expected.

Impacts of a Small Fuel Spill

Potential spill impacts on marine mammals, including sperm whales, are discussed by NMFS (2025a) and BOEM (2017a, 2023a,b). Oil impacts on marine mammals are discussed by Geraci and St. Aubin (1990) and by the Marine Mammal Commission (MMC) (2011) with discussions germane to the Gulf of America 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 EP, there are no unique site-specific issues with respect to spill impacts on these animals that were not analyzed in the previous documents.

The probability of a fuel spill will be minimized by Anadarko's preventative measures during routine operations, including fuel transfer. In the unlikely event of a spill, implementation of Anadarko's OSRP will mitigate and lessen the potential for impacts on sperm whales. Given the open ocean location of the project area, the duration of a small spill and opportunity for impacts to occur would be brief.

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 of the spill 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% would be evaporated or dispersed naturally within 24 hours (NOAA, 2022a). 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 underwater 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.

The probability of a fuel spill will be minimized by Anadarko's preventative measures during routine operations, including fuel transfer. In the unlikely event of a spill, implementation of Anadarko's OSRP will mitigate and lessen the potential for impacts on sperm whales. Given the open ocean location of the project area and the expected brief duration of a small spill, potential impacts to sperm whales are expected to be minimal.

Impacts of a Large Oil Spill

Potential spill impacts on marine mammals, including sperm whales, are discussed by NMFS (2025a) and BOEM (2017a, 2023a,b). Oil impacts on marine mammals are discussed by Geraci and St. Aubin (1990) and by the MMC (2011). For this EP, there are no unique site-specific issues with respect to spill impacts on sperm whales.

Impacts of oil 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, underwater sound, dispersants) (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 oil (and dispersants) directly or via contaminated prey; and stress from the activities and underwater sound of response vessels and aircraft. The level of impact of oil exposure depends on the amount, frequency, and duration of exposure; route of exposure; and type or condition of petroleum compounds or chemical dispersants (Hayes et al., 2021). 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 collisions, entanglement, or other injury or stress. Response vessels are expected to operate in accordance with NTL BOEM-2016-G01 to reduce the potential for colliding with or disturbing these animals. This NTL was reissued in June 2020 to address instances where guidance in the 2020 NMFS Biological Opinion (NMFS, 2020a) and the amendment in April 2021 (NMFS, 2021) replaces compliance with the NTL; a new NTL in response to the 2025 Biological Opinion has not yet been issued. Anadarko intends to follow the mitigation measures summarized in Attachment 3 of the 2025 Biological Opinion (NMFS, 2025a). Based on the current PBR level for the Gulf of America stock of sperm whales (2.0), mortality of a single sperm whale would constitute a significant impact to the local (Gulf of America) stock of sperm whales but would not likely be significant at the species level.

C.3.2 Rice's Whale (Endangered)

A study by Rosel et al. (2021), identified the genetically distinct Northern Gulf of America Bryde's whale stock as a new species of baleen whale named the Rice's whale through DNA analysis. The reclassification was approved by NMFS under 86 FR 47022 and became effective 22 October 2021.

In 2014, a petition was submitted to designate the northern Gulf of America 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 a proposed rule to list was published in 2016 (Hayes et al., 2019). On 15 April 2019, NMFS issued a Final Rule to list the Gulf of America DPS of Bryde's whale as Endangered under the ESA. NMFS Final Rule on the reclassification (86 FR 47022) does not affect the ESA standing; thus, the Rice's whale is listed as an Endangered species.

The Rice's whale is the only year-round resident baleen whale in the northern Gulf of America with the population estimated to be fewer than 100 individuals (NOAA, 2022b). NOAA, in partnership with Scripps Institution of Oceanography and Florida International University, created the Gulf of America Rice's Whale Trophic Ecology Project to develop a comprehensive ecological understanding of the newly identified species (NOAA, 2022b). The group is working on building a photo-identification catalog, conducting animal telemetry, biological sampling, and understanding their prey/distribution. Through animal telemetry, they have identified that Rice's whales make foraging dives during the day near the seafloor.

The Rice's whale is sighted most frequently in the waters over DeSoto Canyon between the 328- and 3,280-ft (100- and 1,000-m) isobaths (Rosel et al., 2016; Hayes et al., 2023). Most sightings 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 of America. Soldevilla et al., (2022) identified new variants of long-moan calls along the northwestern Gulf of America shelf break that were determined to share distinctive features with typical eastern Gulf of America long-moan calls. A genetically confirmed sighting of a Rice's whale individual offshore Corpus Christi, Texas in 2017, along with the newly identified long-moan calls in the northwestern Gulf of America, indicates that Rice's whales may occur in a broader range in the Gulf of America than previously known and this broader range should be considered when designating critical habitat.

Kiszka et al. (2023) studied the drivers of resource selection by Rice's whales in relation to prey availability and energy density. The study indicated that Rice's whales are selective predators consuming schooling prey with the highest energy content (i.e., silver rag [*Ariomma bondi*]). The silver rag is found at a depth range of 25 to 640 m (82 to 2,100 ft) primarily over muddy bottoms on the OCS, although juveniles can be within the surficial waters (Smithsonian Tropical Research Institute, 2015). Therefore, it is unlikely that Rice's whales would occur in the project area. However, support vessels transiting through the 25 to 640 m (82 to 2,100 ft) water depths could encounter a Rice's whale.

Although it is unlikely that the Rice's whales would occur in the project area, IPFs that could affect the Rice's whales include drilling rig presence, underwater sound, and lights; support vessel and helicopter traffic; and both types of spill accidents: a small fuel spill and a large oil spill. Effluent discharges are likely to have negligible impacts on Rice's whales due to rapid dispersion, the small area of ocean affected, the intermittent nature of the discharges, and the mobility and low abundance of Rice's whales in the Gulf of America.

Though NMFS (2025a) stated marine debris as an IPF, compliance with BSEE NTL 2015-G03 and NMFS (2025a) Attachment 2 will minimize the potential for marine debris-related impacts on Rice's whales. NMFS (2025a) estimated one sublethal take and no lethal takes of Rice's whale from marine debris over 45 years of proposed action. Therefore, marine debris is likely to have negligible impacts on Rice's whales and is not discussed further.

Impacts of Drilling Rig Presence, Underwater Sound, and Lights

NMFS (2024) lists Rice's whales in the functional hearing group of low-frequency cetaceans (baleen whales), with an estimated hearing sensitivity from 7 Hz to 36 kHz. Underwater sound produced by the drilling rig may be emitted at levels that could potentially disturb individual whales or mask the sounds animals would normally produce or hear. Underwater sound associated with installation activities is relatively low in intensity (**Section A.1**), and an individual animal's sound exposure would be transient. Underwater sound produced by the drilling rig may be emitted at levels that could potentially disturb individual whales or mask the sounds animals would normally produce or hear. SLs associated with installation activities is relatively weak in intensity, and an individual animal's sound exposure would be transient.

NMFS (2024) presents criteria that are used to determine auditory injury and TTS thresholds for marine mammals. For low-frequency cetaceans, specifically the Rice's whale, auditory injury and TTS onset from non-impulsive sources is estimated to occur at SEL_{24h} of 197 dB re 1 μPa^2 s and 177 re 1 μPa^2 s, respectively. Given the non-impulsive nature of installation operations and DP vessel sound and the estimate source levels, Rice's whales are unlikely to be exposed to nosie above the auditory injury threshold. While sound during installation operations may exceed the TTS threshold, it is expected that, due to the relatively stationary nature of the drilling rig and support vessels, Rice's whales would move away from the proposed operations area, reducing the duration that individuals are exposed to project-related underwater sound, further reducing the likelihood of auditory injuries being realized.

Additionally, the project area is in the Central Gulf of America OCS Planning Area, approximately 119 statute miles (192 km) from the nearest shoreline in Louisiana and outside the main distribution range identified for this species (88 FR 47453; NMFS, 2023, 2025a) so it is unlikely this species will be exposed to sound associated with the project. Therefore, due to the short propagation distance of above-threshold $SEL_{24h,}$ the stationary nature of the proposed activites, and the low likelihood of encountering this species in the proejct area, it is not expected that any Rice's whales will receive exposure levels necessary for the onset of auditory threshold shifts.

Received SPL of 120 dB re 1 µPa from continuous sources (which include the proposed installation operations) are considered high enough to elicit the onset of a behavioral reaction in some marine mammal species. Based on the estimated source levels provided in **Section A.1**, the maximum estimated source level of 195 dB re 1 µPa m for sound produced by project operations may exceed the behavioral disturbance threshold out to 3.5 mi (5.6 km). However, exposure to SPL of 120 dB re 1 µPa does not alone equate to a behavioral response or a biological consequence; rather it represents the level at which onset of a behavioral response may occur that, more importantly, may not result in biologically significant responses (Southall et al., 2016, 2021; Ellison et al., 2012).

Impacts of Support Vessel and Helicopter Traffic

Support vessel traffic has the potential to disturb Rice's whales and creates the potential for vessel strikes. Kiszka et al. (2023) indicated through Bayesian stable isotope mixing models that Rice's whales primarily feed on silver rag found between 25 and 640 m water depths. However, it is unlikely support vessels will encounter Rice's whale given that they are primarily found over DeSoto Canyon between the 100 m (328 ft) and 1,000 m (3,280 ft) isobaths (Rosel et al., 2016; Hayes et al., 2021).

Per the 2025 Biological Opinion, any transit through the Rice's Whale Area (RWA), as identified in the 2020 Biological Opinion, requires a visual observer, either third-party or crew with sufficient training, maintaining vigilant watch for Rice's whales and other marine mammals when within the RWA (NMFS, 2025a). Other requirements when transiting through the RWA include a 10-knot year-round speed restriction, no transit at night or during low visibility, and an operating Automatic Identification System (AIS) onboard for vessels associated with oil and gas activity and 65 feet or greater (NMFS, 2025a). After the completion of transit, a post-transit report for any Rice's whales or other marine mammals must be submitted (NMFS, 2025a). Any deviation from these requirements (such as for an emergency regarding safety of the vessel or crew) requires reporting to BSEE and BOEM within 24 hours (NMFS, 2025a). However, this RWA is positioned over DeSoto Canyon and as noted above, support vessels are not expected to travel through this area during transit to and from the onshore support base on Port Fourchon (**Figure 1**).

When whales are sighted, vessel operators and crews are required to maintain a distance of 500 m (1,640 ft) or greater whenever possible (NTL BOEM-2016-G01; NMFS, 2020a, 2021; 2025a). Vessel operators are required to reduce vessel speed to 10 knots or less, as safety permits, when mother/calf pairs, pods, or large assemblages of cetaceans are observed near an underway vessel (NTL BOEM-2016-G01). When a Rice's whale or potential Rice's whale is sighted while a vessel is underway, the vessel should take action (e.g., attempt to remain parallel to the whale's course, avoid excessive speed or abrupt changes in direction until the whale has left the area) as necessary to avoid violating the relevant separation distance. However, if the whale is sighted within this distance, the vessel should reduce speed and shift the engine to neutral and not re-engage until the whale is outside of the separation area. This does not apply to any vessel towing gear (NMFS, 2025a, Attachment 1).

Helicopter traffic also has the potential to disturb Rice's whales and based on studies of cetacean responses to sound, the observed responses to brief overflights by aircraft were short-term and limited to behavioral disturbances (Smultea et al., 2008). Helicopters maintain altitudes above 700 ft (213 m) during transit to and from the offshore working area. In the event that a whale is observed during transit, the helicopter will not approach or circle the animal(s). In addition, guidelines and regulations issued by NMFS under the authority of the MMPA specify that helicopters maintain an altitude of 1,000 ft (305 m) within 328 ft (100 m) of marine mammals (NMFS, 2025a).

The current PBR level for the Gulf of America stock of Rice's whale is 0.1 (Hayes et al., 2021). Mortality of a single Rice's whale would constitute a significant impact to the species. However, it is unlikely that Rice's whales will occur within the project area, including the transit corridor for support vessels; consequently, the probability of a vessel collision with this species is extremely low. Compliance with these mitigation measures will minimize the likelihood of vessel strikes as well as reduce the chance for disturbing Rice's whales. Due to the brief potential for disturbance and the low density of Rice's whales in the Gulf of America, no significant impacts are expected.

Impacts of a Small Fuel Spill

Potential spill impacts on marine mammals are discussed by NMFS (2025a) and BOEM (2012a, 2015, 2016b, 2017a, 2023a,b). Oil impacts on marine mammals are discussed by Geraci and St. Aubin (1990) and by the MMC (2011). In the unlikely event of a spill, implementation of Anadarko's OSRP will mitigate and reduce the potential for impacts on Rice's whales. Given the open ocean location of the project area and the brief duration of a small spill, any impacts are expected to be minimal.

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. The extent and persistence of impacts would depend on the meteorological and oceanographic conditions at the time of the spill as well as the effectiveness of spill response measures. **Section A.9.1** discusses the likely fate of a small fuel spill and indicates that more than 90% would evaporate or disperse naturally within 24 hours (NOAA, 2022a). The area of diesel fuel on the sea surface would range from 1.2 to 12 ac (0.5 to 5 ha), 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 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 Rice's whales and the unlikelihood of occurrence in the project area, no significant impacts are expected.

Impacts of a Large Oil Spill

Potential spill impacts on marine mammals are discussed by BOEM (2012a, 2015, 2016b, 2017a, 2023b), NMFS (2025a), Geraci and St. Aubin (1990), and by the MMC (2011).

Potential impacts of a large oil spill on Rice's whales could include direct impacts from oil exposure as well as indirect impacts due to response activities and materials (e.g., vessel traffic, underwater sound, dispersants) (MMC, 2011). Direct physical and physiological effects could include skin irritation, inflammation, or necrosis; chemical burns of skin, eyes, and mucous membranes; inhalation of toxic fumes; ingestion of oil (and dispersants) directly or via contaminated prey; and stress from the activities and sound of response vessels and aircraft. The level of impact of oil exposure depends on the amount, frequency, and duration of exposure; route of exposure; and type or condition of petroleum compounds or chemical dispersants (Hayes et al., 2019). 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 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 Rice's whales and potentially result in vessel strikes, entanglement, or other injury or stress. Response vessels are expected to operate in accordance with NTL BOEM-2016-G01 (see **Table 1**) to reduce the potential for striking or disturbing these animals.

In the event of a large spill, the level of vessel and aircraft activity associated with spill response could disturb Rice's whales and potentially result in vessel collisions, entanglement, or other injury or stress. These include retaining vessel transit details if transiting within the expanded Rice's whale area, maintaining separation distances, and utilizing AIS on vessels 65 ft or greater, among others. Response vessels are expected to operate in accordance with NTL BOEM 2016 G01 and NMFS (2020a, 2021, 2025a Attachment 3 and Attachment 4) (see **Table 1**) to reduce the potential for colliding with or disturbing these animals. In the event of oil from a large spill contacting Rice's whales, it is expected that impacts resulting in the injury or death of individual Rice's whales would be significant based on the current PBR level for the Gulf of America subspecies and stock (0.1). Mortality of a single Rice's whale would constitute a significant impact to the local (Gulf of America) stock of Rice's whales. The core distribution area for Rice's whales is within the eastern Gulf of America OCS Planning Area; therefore, it is unlikely that Rice's whales would occur within the project area. Consequently, the probability of spilled oil from a project-related well blowout reaching Rice's whales is extremely low.

C.3.3 West Indian Manatee (Threatened)

Most of the Gulf of America manatee population is located in peninsular Florida, but manatees have been seen as far west as Texas during the summer (USFWS, 2001a, 2023a). A species description is presented in the West Indian manatee recovery plan (USFWS, 2001a) and stock assessment report (USFWS, 2023a). Critical habitat for the West Indian manatee 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 (Wilson, 2003). Manatees are typically found in coastal and riverine habitats, but have been seen on rare occasions in deepwater areas during colder months when they seek refuge from colder coastal waters (USFWS, 2001a, 2023a; Fertl et al., 2005; Pabody et al., 2009). There have been three verified reports of Florida manatee sightings on the OCS during seismic mitigation surveys in mean water depths of over 1,969 ft (600 m) (Barkaszi and Kelly, 2019).

IPFs that potentially may affect manatees include support vessel and helicopter traffic and a large oil spill. A small fuel spill in the project area would be unlikely to affect manatees, as the project area is approximately 119 mi (192 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 dissipating. Compliance with BSEE NTL 2015-G03 is intended 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 (USFWS, 2001a). Manatees are expected to be limited to 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 (NMFS, 2025a, Attachment 3). 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.

NTL 2016-G01 was reissued in June 2020 to address instances where guidance in the 2020 NMFS Biological Opinion (NMFS, 2020a) replaces compliance with the NTL. A new NTL in response to the 2025 Biological Opinion has not yet been issued. Anadarko intends to follow the mitigation measures summarized in Attachment 3 of the 2025 Biological Opinion (NMFS, 2025a). When aquatic protected species are sighted while a vessel is underway, the vessel should take action as necessary to avoid violating the relevant separation distance (e.g., attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area). If aquatic protected species are sighted within the relevant separation distance, the vessel should reduce speed and shift the engine to neutral, not engaging the engines until animals are clear of the area. This does not apply to any vessel towing gear (e.g., source towed array and site clearance trawling).

Compliance with these mitigation measures will minimize the likelihood of vessel collisions as well as reduce the chance for disturbing manatees during daylight hours. The current PBR level for the Florida subspecies of West Indian manatee is 14 (USFWS, 2014). In the event of a vessel collision during support vessel transits, the mortality of a single manatee would constitute an adverse but insignificant impact to the subspecies.

Helicopter traffic has the potential to disturb manatees and Rathbun (1988) reported that manatees were disturbed more by low-flying 66 to 252 ft (20 to 160 m) helicopters than by fixed-wing aircraft. Helicopters used in support operations maintain a minimum altitude of 700 ft (213 m) while in transit offshore, 1,000 ft (305 m) over unpopulated areas or across coastlines, and 2,000 ft (610 m) 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 1,000 ft (305 m) within 328 ft (100 m) of marine mammals (BOEM, 2017a; NMFS, 2025a). This helicopter traffic mitigation measure will minimize the potential for disturbing manatees. No significant impacts are expected.

Impacts of a Large Oil Spill

The potential for significant impacts to manatees from a large oil spill would be most likely associated with coastal oiling of manatee habitats. Based on the 30-day OSRA modeling (**Table 3)** Cameron Parish in Louisiana is the coastal areas most likely to be affected (4% probability within 30 days). Within 30 days, shoreline segments of six Louisiana parishes and five Texas counties have a probability of 1% to 4% of being contacted. Manatee critical habitat does not exist in these areas and manatees are unlikely to be present. Based on the 60-day OSRA modeling estimates (**Table 4**) there is potential for shoreline contact between Cameron County, Texas, and Miami-Dade County, Florida, with a maximum conditional probability of contact of 13% in Terrebonne Parish, Louisiana. This range does include areas of manatee critical habitat in southwest Florida.

In the event that manatees were exposed to oil, effects could include direct impacts from oil exposure as well as indirect impacts due to response activities and materials (e.g., vessel traffic, underwater sound, dispersants) (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 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. Behavioral responses can include displacement of animals from prime habitat, disruption of social structure, changing 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 and NMFS (2020a, 2021, 2025a Attachment 3) (see **Table 1**) to reduce the potential for striking or disturbing these animals, and therefore no significant impacts are expected.

In the event of oil from a large spill enters areas inhabited by manatees, it is expected that impacts resulting in the injury or death of individual manatees could be significant at the population level. The current PBR level for the Florida subspecies of Antillean manatee is 14 (USFWS, 2014). It is not anticipated that groups of manatees would occur in coastal waters of the north-central Gulf of America and therefore large groups are unlikely to be affected by a large spill. Mortality of individual manatees from a large oil spill would constitute an adverse but insignificant impact to the subspecies.

C.3.4 Non-Endangered Marine Mammals (Protected)

Excluding the three Endangered or Threatened species that have been cited previously, there are 20 additional species of marine mammals that may be found in the Gulf of America, including dwarf and pygmy sperm whales (*Kogia sima* and *K. breviceps*, respectively), four 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 (*Stenella attenuata*), spinner dolphin (*S. longirostris*), and bottlenose dolphin. A brief summary is presented below, and additional information on these groups is presented by BOEM (2017a).

Dwarf and pygmy sperm whales. At sea, it is difficult to differentiate dwarf sperm whales from pygmy sperm whales, and sightings are often grouped together as *Kogia* spp. Both species have a worldwide distribution in temperate to tropical waters. In the Gulf of America, 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; Hayes et al., 2023). Either species could occur in the project area.

Beaked whales. Four species of beaked whales are known to occur in the Gulf of America: Blainville's beaked whale (*Mesoplodon densirostris*), Sowerby's beaked whale (*M. bidens*), Gervais' beaked whale (*M. europaeus*), and Cuvier's beaked whale (*Ziphius cavirostris*). Stranding records (Würsig et al., 2000) as well as passive acoustic monitoring in the Gulf of America (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 America (Bonde and O'Shea, 1989). There are a number of extralimital strandings and sightings reported beyond the recognized range of Sowerby's beaked whale (e.g., Canary Islands, Mediterranean Sea), including from the eastern Gulf of America (Pitman and Brownell, 2020). Blainville's beaked whales are rare, with only four documented strandings in the northern Gulf of America (Würsig et al., 2000) and three sightings in the Gulf of America (Hayes et al., 2021).

Due to the difficulties of at-sea identification, beaked whales in the Gulf of America are identified either as Cuvier's beaked whales or are grouped into an undifferentiated species complex (*Mesoplodon* spp.). In the northern Gulf of America, they are broadly distributed in water depths greater than 3,281 ft (1,000 m) over lower slope and abyssal landscapes (Davis et al., 2000; Hldebrand et al., 2015). Any of these species could occur in the project area (Hayes et al., 2023).

Delphinids. Fourteen species of delphinids are known from the Gulf of America, including Atlantic spotted dolphin (*Stenella frontalis*), bottlenose dolphin, 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, pygmy killer whale (*Feresa attenuata*), short-finned pilot whale (*Globicephala macrorhynchus*), Risso's dolphin (*Grampus griseus*), rough-toothed dolphin (*Steno bredanensis*), spinner dolphin, and striped dolphin (*Stenella coeruleoalba*). Any of these species could occur in the project area (Hayes et al., 2023).

The bottlenose dolphin is a common inhabitant of the northern Gulf of America, 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 America are separated into 31 geographically distinct population units, or stocks, for management purposes by NMFS (Hayes et al., 2023).

IPFs that potentially may affect non-endangered marine mammals include installation vessel presence, underwater sound, and lights; support vessel and helicopter traffic; and two types of accidents (a small fuel spill and a large oil 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 Drilling Rig Presence, Underwater Sound, and Lights

The presence of the drilling rig 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 sound that might otherwise be avoided. Despite the attraction of offshore vessels as food sources for non-endangered marine mammals, support vessel presence and lighting are not considered as IPFs for marine mammals (BOEM, 2017a).

Sound from drilling has the potential to disturb marine mammals. As discussed in **Section A.1,** underwater sound impacts would be expected at greater distances when DP thrusters are in use than with vessel sound alone and are dependent on variables relating to sea state conditions, thruster type and usage. Three functional hearing groups are represented in the 20 non-endangered cetaceans found in the Gulf of America. Eighteen of the twenty odontocete species are considered to be in the high-frequency functional hearing group and two species (*Kogia* spp.) are in the very high-frequency functional hearing group (NMFS, 2024). Thruster sound will affect each group differently depending on the frequency bandwidths produced by operations. Generally, underwater sound produced by vessels on DP is dominated by frequencies below 10 kHz. Thus, DP sound sources are out of the audible range for the high-frequency group.

For high-frequency cetaceans exposed to a non-impulsive source (like drilling), auditory injury is estimated to occur when the mammal has received an SEL_{24h} of 201 dB re 1 µPa^2 s over a 24-hour period. Similarly, TTS is estimated to occur when the mammal has received an SEL_{24h} of 181 dB re 1 µPa^2 s. Given the non-impulsive nature of drilling activities and subsea equipment operations and the estimate source levels, marine mammals are unlikely to be exposed to sound above the auditory injury threshold. While sound originating from drilling may exceed the TTS threshold, it is expected that marine mammals would move away from the operations area, reducing the duration that individuals are exposed to project-related underwater sound, further reducing the likelihood of auditory injuries being realized. Therefore, due to the short propagation distance of above-threshold SEL_{24h}, the transient nature of marine mammals and the stationary nature of the proposed activities, it is not expected that any marine mammals will receive exposure levels necessary for the onset of auditory threshold shifts.

NMFS (2024) presents criteria used to determine auditory injury thresholds for marine mammals but the behavioral disturbance thresholds were not updated in this most recent acoustic guidance; these behavioral disturbance thresholds are established and published by NMFS in 70 FR 1871 and summarized in NMFS (2025b). Received SPL of 120 dB re 1 µPa from a continuous source (which includes the proposed installation operations) is considered high enough to elicit a behavioral reaction in some marine mammal species. Based on the estimated source levels provided in **Section A.1**, the maximum estimated source level of 195 dB re 1 µPa m for sound produced by project operations may exceed the behavioral disturbance threshold out to 3.5 mi (5.6 km). However, in the case of behavioral responses, received levels alone do not indicate a behavioral response and, more importantly, do not equate to biologically important responses (Southall et al., 2016, 2021; Ellison et al., 2012.

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 America have been exposed to underwater sound 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). Due to the limited scope, timing, and geographic extent of drilling activities, this project would represent a small, temporary contribution to the overall sound regime, and any short-term behavioral impacts are not expected to be biologically significant to marine mammal populations. Drilling rig vessel lighting and presence are not identified as IPFs for marine mammals by BOEM (2017a).

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 vessels slow down or stop to avoid striking protected species. This NTL was reissued in June 2020 to address instances where guidance in the 2020 NMFS Biological Opinion (NMFS, 2020a) replaces compliance with the NTL; a new NTL in response to the 2025 Biological Opinion has not yet been issued. However, Anadarko intends to follow the mitigation measures summarized in Attachment 3 of the 2025 Biological Opinion (NMFS, 2025a). The NTL 2016-G01 also required 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 100 m (328 ft) or greater when toothed whales are sighted and 50 m (164 ft) when small cetaceans are sighted (NMFS, 2020a, 2025a Attachment 3). 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. All vessels must, to the maximum extent practicable, attempt to maintain a minimum separation distance of 50 m (164 ft) from all "other aquatic protected species" including sea turtles, with an exception made for those animals that approach the vessel. Vessel speeds must also be reduced to 10 knots or less when mother/calf pairs, pods, or large assemblages (greater than three) of any marine mammal are observed near a vessel. Although vessel strike avoidance measures described in NMFS (2020a, 2025a) are only applicable to ESA-listed species, complying with them may provide additional indirect protection to non-listed species as well.

When protected species are sighted while a vessel is underway, the vessel should take action as necessary to avoid violating the relevant separation distance (e.g., attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area). If protected species are sighted within the relevant separation distance, the vessel should reduce speed and shift the engine to neutral, not engaging the engines until animals are clear of the area. This does not apply to any vessel towing gear (e.g., source towed array, site clearance trawling). Use of these measures will minimize the likelihood of vessel collisions as well as reduce the chance for disturbing marine mammals, and therefore no significant impacts are expected.

Helicopter traffic has the potential to disturb marine mammals (Würsig et al., 1998) but relatively high-altitude flying is conducted to minimize the potential for disturbances. While flying offshore, helicopters maintain altitudes above 700 ft (213 m) during transit to and from the working area. In addition, guidelines and regulations specify that helicopters maintain an altitude of 1,000 ft (305 m) within 328 ft (100 m) of marine mammals (BOEM, 2012a; 2016a). Maintaining these altitudes during helicopter operations will minimize the potential for disturbing marine mammals, and no significant impacts are expected (BOEM, 2017a; NMFS, 2025a).

The current PBR level for several non-endangered cetacean species in the Gulf of America are less than three individuals (e.g., rough-toothed dolphin = undetermined, Clymene dolphin = 2.5, Fraser's dolphin = 1.0, killer whale = 1.5, pygmy and false killer whales = 2.8, dwarf and pygmy sperm whales = 2.5) (Hayes et al., 2022). Mortality of individuals equal to or in excess of their PBR level would constitute a significant impact at a population level to the local (Gulf of America) stocks of these species.

Impacts of a Small Fuel Spill

Potential spill impacts on marine mammals are discussed by BOEM (2017, 2023a,b). Oil impacts on marine mammals in general are discussed by Geraci and St. Aubin (1990). For this EP, 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 Anadarko's preventative measures during fuel transfer. In the unlikely event of a spill, implementation of Anadarko's OSRP is expected to lessen the potential for impacts on marine mammals. EP Section H provides details 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 slick 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 sound 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 dissipating (**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 Oil Spill

Potential spill impacts on marine mammals are discussed by BOEM (2017a, 2023a,b). For this EP, there are no unique site-specific issues. Impacts of oil 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, underwater sound, dispersants) (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 oil (and dispersants) directly or via contaminated prey. Complications of the above may lead to dysfunction of immune and reproductive systems (De Guise et al., 2017), physiological stress, declining physical condition, and death. Indirect impacts could include stress from the activities and sound 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., use of dispersants, controlled burns, skimmers, boom) (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 are expected to 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.

This NTL was reissued in June 2020 to address instances where guidance in the 2020 NMFS Biological Opinion (NMFS, 2025a) and amendment in April 2021 (NMFS, 2021) replaces compliance with the NTL; a new NTL has not yet been issued in response to the 2025 Biological Opinion. Anadarko intends to follow the mitigation measures summarized in Attachment 3 of the 2025 Biological Opinion (NMFS, 2025a). The application of dispersants greatly reduces exposure risks to marine mammals as the dispersants would remove oil from the surface thereby reducing the risk of contact and rendering it less likely to adhere to skin, baleen plates, or other body surfaces (BOEM, 2017a).

Based on the current PBR level for several non-endangered cetacean species in the Gulf of America that are less than 3 individuals (e.g., rough-toothed dolphin = undetermined, Clymene dolphin = 2.5, Fraser’s dolphin = 1.0, killer whale = 1.5, pygmy and false killer whales = 2.8, dwarf and pygmy sperm whales = 2.5) (Hayes et al., 2022), mortality of individuals equal to or in excess of their PBR level would constitute a significant impact at the population level to the local (Gulf of America) stocks of these species.

C.3.5 Sea Turtles (Endangered/Threatened)

Five species of Endangered or Threatened sea turtles may be found near the project area. Endangered species include the leatherback, Kemp's ridley, and hawksbill turtles. As of 6 May 2016, the entire North Atlantic DPS of the green turtle is listed as threatened (81 FR 20057). The DPS of loggerhead turtles that occurs in the Gulf of America is listed as Threatened.

Critical habitat has been designated for the loggerhead turtle in the Gulf of America as shown in **Figure 3**. Loggerhead turtles in the Gulf of America 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, 2022). 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 0.99 mi (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 America (and Atlantic Ocean) as critical habitat. *Sargassum* is a brown algae (Class Phaeophyceae) that takes on a planktonic, often epipelagic existence after being removed from reefs during rough weather. Rafts of *Sargassum* 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; 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, 2022).

The nearest designated nearshore reproductive critical habitat for loggerhead sea turtles is approximately 240 mi (386 km) from the project area. The project area is located within the designated *Sargassum* critical habitat for loggerhead sea turtles (**Figure 3**).

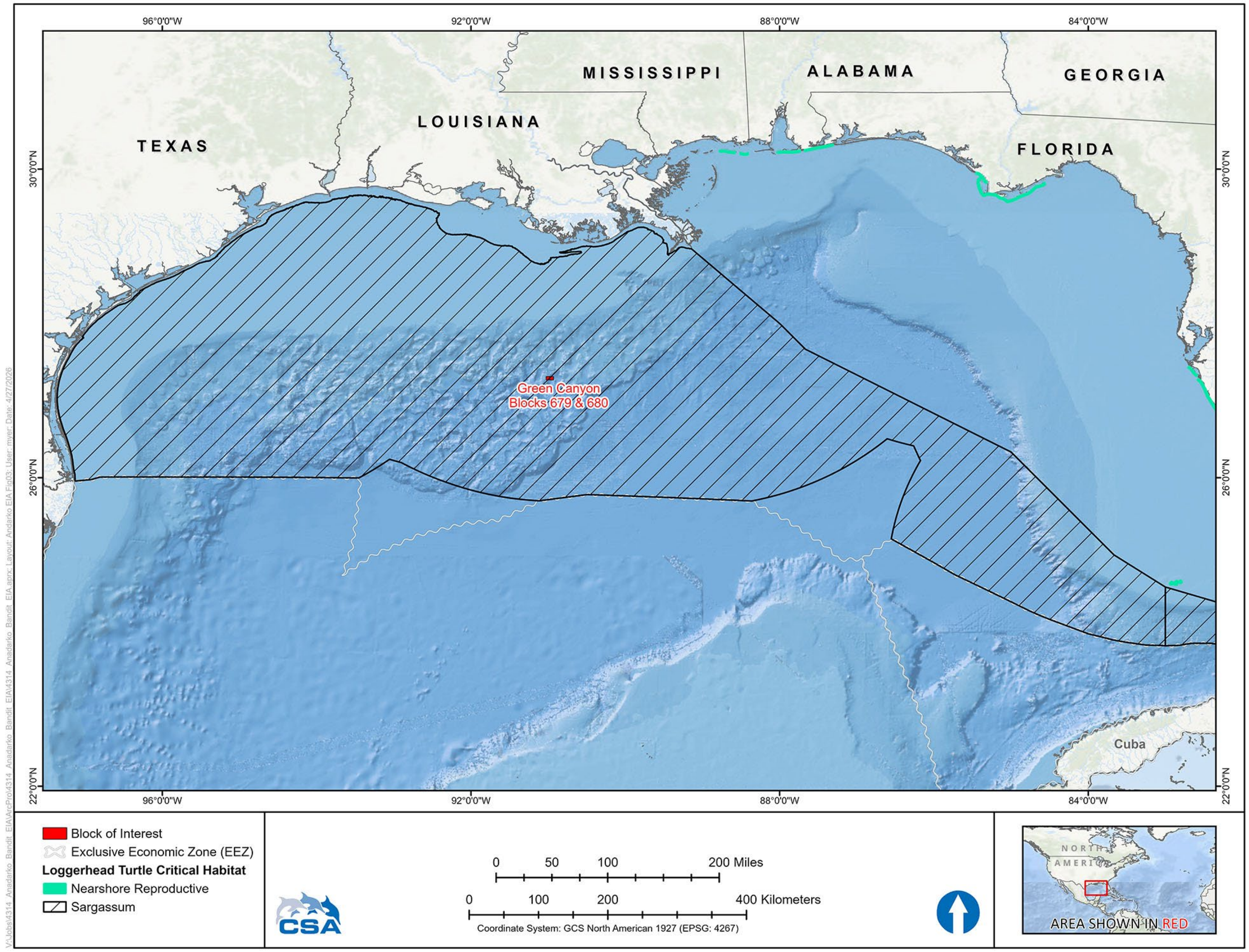

Figure 3. Location of loggerhead turtle designated *Sargassum* critical habitat and nearshore reproductive habitat in relation to the project area.

In 2023, NMFS proposed critical habitat for the Northwest Atlantic DPS of green turtles (NMFS, 2025a). Like the designation for the loggerhead turtle, this includes nearshore reproductive habitat and *Sargassum* habitat (NMFS, 2025a). The nearshore reproductive habitat is from mean low water to 20 m of water along the shores of parts of Texas, southeastern Alabama, and all of Florida (NMFS, 2025a). The *Sargassum* habitat covers most of the northern Gulf of America to the edge of the U.S. EEZ (NMFS, 2025a). Neither critical habitat for the green turtle has been formally designated.

Leatherbacks are the species most likely to be present near the project area, as they are the most pelagic of the sea turtles and feed on populations of gelatinous plankton, such as jellyfish and salps in all water depths. Loggerhead, green, hawksbill, and Kemp's ridley turtles are typically inner-shelf and nearshore species but may be found transiting in oceanic waters during seasonal migrations. Loggerheads are more likely to occur or be attracted to offshore structures than the other species. 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 *Sargassum* rafts and other flotsam. Leatherbacks, while not specifically associated with Sargassum, do utilize similar pelagic habitats for foraging where Sargassum is routinely found.

All five sea turtle species in the Gulf of America 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.

Sea turtle nesting in the northern Gulf of America 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, nd-a) and, to a lesser extent, from Texas through Alabama (NMFS and USFWS, 2008).
- Green turtles – green and leatherback turtles infrequently nest on Florida Panhandle beaches (Florida Fish and Wildlife Conservation Commission, nd-b).
- Leatherback turtles – Leatherback turtles infrequently nest on Florida Panhandle beaches (Florida Fish and Wildlife Conservation Commission, nd-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 et al., 2011). A much smaller population nests in Padre Island National Seashore, Texas, mostly as a result of reintroduction efforts (NMFS et al., 2011). A total of 449 Kemp's ridley turtle nests were counted on Texas beaches in 2025 (Turtle Island Restoration Network, 2025). This is an increase from 2024 and 2023, when a total of 340 Kemp's ridley turtle nests were counted on Texas beaches in 2024 and a total of 256 Kemp's ridley turtle nests were counted during the 2023 nesting season. 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.
- 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 (USFWS, 2016a).

IPFs that could potentially affect sea turtles include drilling rig presence, underwater sound, and lights; support vessel and helicopter traffic; and two types of accidents (a small fuel spill and a large oil spill). Effluent discharges are likely to have negligible impacts on sea turtles due to rapid dispersion, the small area of ocean affected, and the intermittent nature of the discharges.

Though NMFS (2025a) stated marine debris as an IPF, compliance with NTL BSEE 2015-G013 (See **Table 1**) and NMFS (2025a) Attachment 2 will minimize the potential for marine debris-related impacts on sea turtles. NMFS (2020a, 2025a) estimated a small proportion of individual sea turtles would be adversely affected from exposure to marine debris. Therefore, marine debris is likely to have negligible impacts on sea turtles and is not discussed further in the EIA.

Impacts of Drilling Rig Presence, Underwater Sound, and Lights

Drilling activities produce a broad array of sounds at frequencies and intensities that may be detected by sea turtles (Samuel et al., 2005; Popper et al., 2014). Potential impacts may include behavioral disruption and temporary or permanent displacement from the area near the sound source. Sea turtles can hear low to mid-frequency sounds and they appear to hear best between 200 and 750 Hz; they do not respond well to sounds above 2,000 Hz, although primary hearing frequency ranges vary per species and life stage (Ketten and Bartol, 2005; Piniak, 2012a,b; Martin et al., 2012; Piniak et al., 2016).

NMFS (2025b), which uses threshold estimates from Accomando et al. (2025), recommends SEL_{24h} auditory injury and TTS thresholds of 198 and 178 dB re 1 μPa^2 s, respectively, for non-impulsive sources, and an SPL behavioral threshold of 175 dB re 1 µPa for all sound sources. Based on the assessment conducted in the NMFS Biological Opinion (NMFS, 2025a), as well as the estimated source levels for drilling relative to the acoustic thresholds for sea turtles, there is a minimal likelihood of acoustic injury such as auditory injury in sea turtles, and behavioral responses to sounds produced by activities such as vessel operations are not expected beyond 10 m (33 ft) from the source. Certain sea turtles, especially loggerheads, may be attracted to offshore structures (Lohoefener et al., 1990; Gitschlag et al., 1997; Colman et al., 2020) and thus may be more susceptible to impacts from sounds produced during routine installation activities. Any impacts would likely be short-term behavioral changes such as diving and evasive swimming, disruption of activities, or departure from the area. Because of the limited scope and short duration of drilling 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 (Tuxbury and Salmon, 2005; Berry et al., 2013; Simões et al., 2017). 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 America (Lutcavage et al., 1997; NMFS, 2025a). 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 addresses

1) protected species identification training; 2) vessel operators and crews' observational vigilance and protected species collision avoidance; and 3) reporting of sightings of any injured or dead protected species. This NTL was reissued in June 2020 to address instances where guidance in the 2020 NMFS Biological Opinion (NMFS, 2020a) and amendment in April 2021 replaces compliance with the NTL; a new NTL has not been issued in response to the 2025 Biological Opinion. Anadarko intends to follow the mitigation measures summarized in Attachment 3 of the 2025 Biological Opinion (NMFS, 2025a).

When sea turtles are sighted, vessel operators and crews must, to the maximum extent possible, attempt to maintain a distance of 164 ft (50 m) or greater whenever possible (NMFS, 2021, 2025a). When sea turtles are sighted while a vessel is underway, the vessel should take action as necessary to avoid violating the relevant separation distance (e.g., attempt to remain parallel to the animal's course, avoid excessive speed or abrupt changes in direction until the animal has left the area). If protected species are sighted within the relevant separation distance, the vessel should reduce speed and shift the engine to neutral, not engaging the engines until animals are clear of the area. This does not apply to any vessel towing gear (e.g., source towed array and site clearance trawling; NMFS, 2025a, Attachment 1). Compliance with these mitigation measures will minimize the likelihood of vessel collisions as well as reduce the chance for disturbing sea turtles. Therefore, no significant impacts are expected.

Sound generated from support helicopter traffic has the potential to disturb sea turtles, but relatively high-altitude flying is conducted to minimize the potential for disturbances. While flying offshore, helicopters maintain altitudes above 700 ft (213 m) during transit to and from the working area. This altitude is intended to minimize the potential for disturbing sea turtles, and no significant impacts are expected (NMFS, 2025a; BOEM, 2012a).

Impacts of a Small Fuel Spill

Potential spill impacts on sea turtles are discussed by NMFS (2020a, 2025a) and BOEM (2017a, 2023a,b). For this EP, 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 Anadarko's preventative measures during fuel transfer. In the unlikely event of a spill, implementation of Anadarko's OSRP is expected to minimize potential impacts on sea turtles. EP Section H provides details on spill response measures. Given the open ocean location of the project area, the duration of a small spill would be brief and the potential for impacts to occur would be minimal.

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 sound of response vessels and aircraft (NMFS, 2020b, 2025a). The extent and persistence of impacts would depend on the meteorological and oceanographic conditions at the time of the release 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% would be evaporated or dispersed naturally within 24 hours (NOAA, 2022a). 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 240 mi (386 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 and degradation.

Loggerhead Critical Habitat – *Sargassum*. The project area is located within the designated *Sargassum* critical habitat for the loggerhead turtles (**Figure 3**). If fuel did contact the *Sargassum* habitat, juvenile sea turtles come into contact with or ingest diesel fuel, impacts could include 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 America. However, if juvenile sea turtles are present in the area impacted, significant impacts to the regional population could occur.

Impacts of a Large Oil Spill

Impacts of oil spills on sea turtles can include direct impacts from oil exposure as well as indirect impacts due to response activities (e.g., vessel traffic, underwater sound, dispersant use). Direct physical and physiological effects can include skin irritation, inflammation, or necrosis; chemical burns of skin, eyes, and mucous membranes; inhalation of toxic fumes and smoke (e.g., from in situ burning of oil); ingestion of oil (and dispersants) directly or via contaminated food; and stress from the activities and underwater 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. 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, 2021; NMFS, 2020b). In the unlikely event of a spill, implementation of Anadarko's OSRP is expected to minimize the potential for these types of impacts on sea turtles. EP Section H provides further details on spill response measures.

Studies of oil effects on loggerhead turtles in a controlled setting (NOAA, 2021; 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. Sea turtles 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, 2025a).

Loggerhead Critical Habitat – Nesting Beaches. If spilled oil reaches sea turtle nesting beaches, nesting sea turtles and egg development could be affected (NMFS, 2020a, 2025a). 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).

Based on the 30-day OSRA modeling (**Table 3**), Cameron Parish in Louisiana is the coastal areas most likely to be affected (4% probability within 30 days). Within 30 days, shoreline segments of six Louisiana parishes and five Texas counties have a probability of 1% to 4% of being contacted. Based on the 60-day OSRA modeling estimates (**Table 4**), northern Gulf of America shorelines have up to a 13% conditional probability of shoreline contact within 60 days of a spill.

The nearest nearshore reproductive critical habitat for the loggerhead turtle is located approximately 240 mi (386 km) from the project area (**Figure 3**) and is predicted by the 60-day OSRA model to have 1% or less conditional probability of contact within 60 days of a spill.

Loggerhead Critical Habitat – *Sargassum*. The project area is located within the loggerhead turtle critical habitat designated as *Sargassum* habitat, which includes most of the Western and Central Planning Areas in the Gulf of America and parts of the southern portion of the Eastern Planning Area (**Figure 3**) (NMFS, 2021). Because of the large area covered by the designated *Sargassum* critical habitat for loggerhead turtles, a large spill could result in a substantial part of the *Sargassum* critical habitat in the northern Gulf of America being oiled. For example, the 2010 *Deepwater Horizon* spill affected approximately one-third of the *Sargassum* habitat in the northern Gulf of America (BOEM, 2014). It is unlikely that the entire 40,662,810 ha (100,480,000 ac) of *Sargassum* critical habitat would be affected by a large spill. Because *Sargassum* spp. is a floating, pelagic species, it would only be affected by impacts that occur near the surface.

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. also 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 sublethal effects, including a reduction 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 America 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).

Impacts to sea turtles from a large oil spill and associated cleanup activities would depend on spill extent, duration, and season (relative to turtle nesting season); the amount of oil reaching the shore; the importance of specific beaches to sea turtle nesting; and the level of cleanup vessel and beach crew activity required. In the event of oil from a large spill, it is expected that impacts resulting in the injury or death of individual sea turtles would be adverse but not likely significant at the population level. In the event that spilled oil reached nesting beaches during nesting period(s), the level of mortality (and impact) would increase.

C.3.6 Piping Plover (Threatened)

The Piping Plover is a migratory shorebird that overwinters along the southeastern U.S. and Gulf of America coasts. This Threatened species experienced a historical decline in population as a result of hunting, habitat loss and modification, predation, and disease (USFWS, 2003). However, as a result of intensive conservation and management, populations of Piping Plover appear to have been increasing since 1991 throughout its range (BirdLife International, 2020). Critical overwintering habitat has been designated, including beaches in Texas, Louisiana, Mississippi, Alabama, and Florida (**Figure 4**). 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.

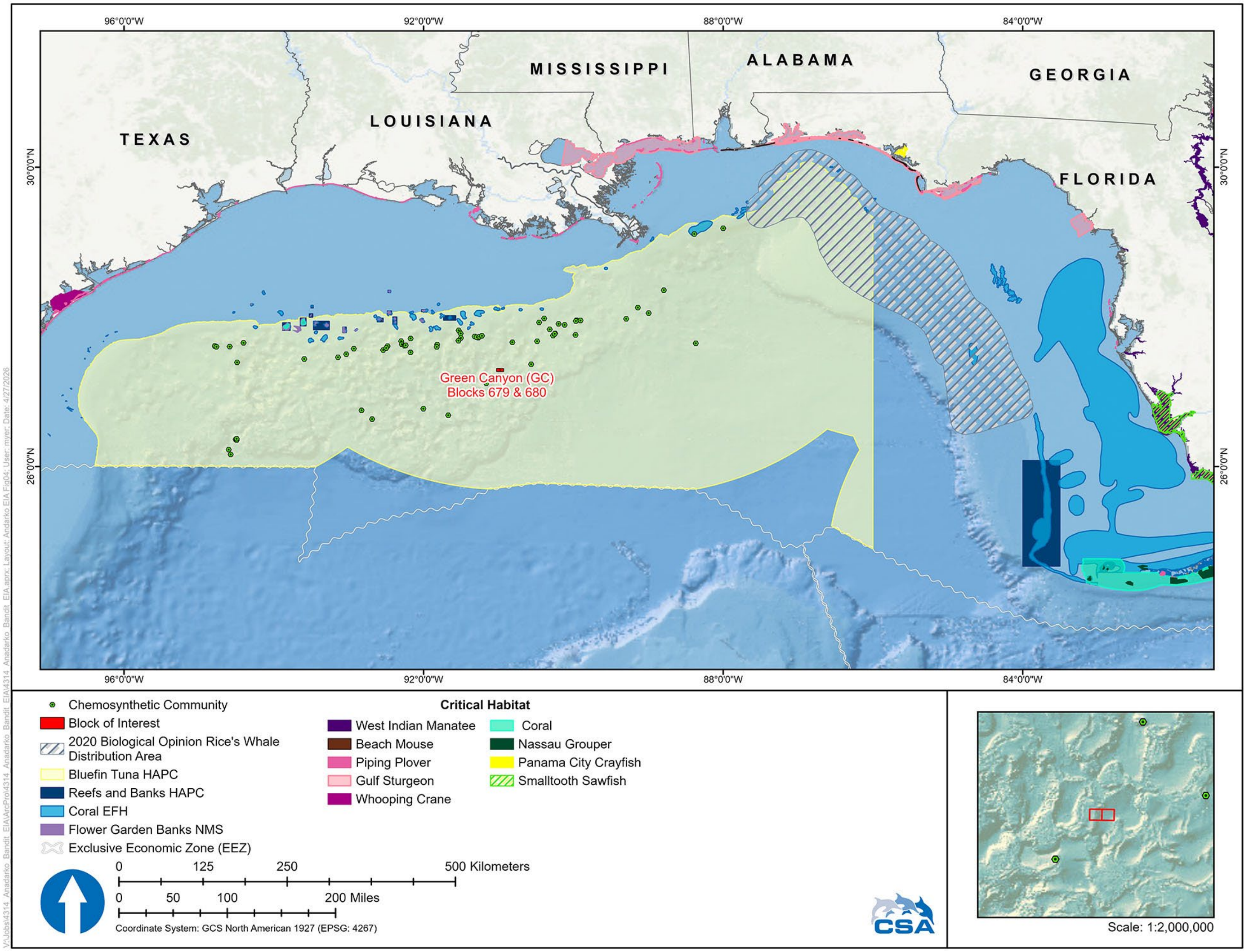

Figure 4. Location of selected environmental features in relation to the project area. EFH = Essential Fish Habitat; HAPC = Habitat of Particular Concern, NMS = National Marine Sanctuary.

A large oil 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 dissipating (see explanation in **SectionA.9.1**). Sound from helicopters would be unlikely to significantly affect Piping Plover populations, because it is assumed that helicopters will maintain an altitude of 1,000 ft (305 m) over unpopulated areas or across coastlines.

Impacts of a Large Oil Spill

The project area is approximately 119 mi (192 km) from the nearest shorelines designated as critical habitat for the Piping Plover (**Figure 4**). Based on the 30-day OSRA modeling (**Table 3**), Cameron Parish in Louisiana is the coastal area most likely to be affected (4% probability within 30 days). Within 30 days, shoreline segments of six Louisiana parishes and five Texas counties have a probability of 1% to 4% of being contacted. The 60-day OSRA modeling (**Table 4**) predicts that during the spring, there is up to 13% 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 oiled shores or secondarily contaminate themselves through ingestion of oiled intertidal sediments and prey (BOEM, 2017a). 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. Anadarko has extensive resources available to protect and rehabilitate wildlife in the event of a spill reaching the shoreline, as detailed in the OSRP. Deaths of numerous Piping Plovers from a large spill or spill response activities could be significant at the species level.

However, a large spill that contacts shorelines would not necessarily substantially impact Piping Plovers. In the aftermath of the *Deepwater Horizon* incident, Gibson et al. (2017) completed thorough surveys of coastal Piping Plover habitat in coastal Louisiana, Mississippi, and Alabama and found that only 0.89% of all observed Piping Plovers were visibly oiled, leaving the authors to conclude that the *Deepwater Horizon* incident did not substantially affect Piping Plover populations.

C.3.7 Whooping Crane (Endangered)

The Whooping Crane is a large omnivorous wading bird listed as an Endangered species. Three wild populations live in North America (National Wildlife Federation, 2016). One population overwinters 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 an estimated population of 557 in and around Aransas NWR during the 2024–2025 winter (Butler et al., 2025), a slight increase from an estimated 536 individuals counted in the 2022 to 2023 winter survey. 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 (USFWS, 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.

A large oil spill is the only IPF that potentially may affect Whooping Cranes. A small fuel spill in the project area would be unlikely to affect Whooping Cranes, due to the distance of the project area 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 to natural dispersion and degradation.

Impacts of a Large Oil Spill

A large oil spill is unlikely to affect Whooping Cranes as the project area is approximately 341 mi (549 km) from the Aransas NWR, which is the nearest designated critical habitat. The 30-day OSRA model (**Table 3**) predicts that there is a 1% probability that an oil spill in the project area would reach a shoreline designated as critical habitat for the Whooping Crane in Calhoun County, Texas. The 60-day OSRA model (**Table 4**) predicts that there is a 4% or less chance of 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 shellfish, frogs, and fishes. 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. Due to low population numbers, deaths of individual Whooping Cranes would likely be significant at the species level. In the event of a spill, Anadarko would work with the applicable state and federal agencies to prevent impacts on Whooping Cranes. Anadarko has extensive resources available to protect and rehabilitate wildlife in the event of a spill reaching the shoreline, as detailed in the OSRP.

C.3.8 Black-capped Petrel

The Black-capped Petrel is a pelagic seabird that solely nests on Hispaniola and was listed as Endangered under the ESA in 2024. The species travels long distances to forage on fish, squid, crustaceans, and *Sargassum* (Simons et al., 2013) and individuals have occasionally been sighted in the northern Gulf of America. While the Gulf of America is not their primary foraging grounds, the most recent species status review (USFWS, 2023b) reported 11 sightings in the Gulf of America in 2017–2018 during surveys as part of the Gulf of Mexico Marine Assessment Program for Protected Species. Overall, the population of Black-capped Petrels is declining, largely due to deforestation and urbanization on Hispaniola. Exact population numbers are unknown due to the difficulty in obtaining accurate counts and their nocturnal nature, but BirdLife International (2018) estimated a total of 1,000 to 2,000 mature individuals and an overall population of 2,000 to 4,000 individuals.

IPFs that potentially may affect the Black-capped Petrel include drilling rig presence, underwater sound, lighting, support vessel and helicopter traffic; and two types of accidents (a small fuel spill and a large oil 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. The IPFs with potential impacts listed in **Table 2** are discussed below.

Impacts of Drilling Rig Presence, Underwater Sound, and Lights

Marine birds that frequent offshore oil and gas operations 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 collide with offshore structures, resulting in injury and/or death (Wiese et al., 2001; Russell, 2005). Black-capped Petrels may be attracted to lights on the drilling rig, which could increase the risk of a collision.

Mortality of migrant birds at tall towers and other land-based structures has been reviewed extensively, and the mechanisms involved in offshore vessel collisions appear to be similar. In some cases, birds simply do not see a part of the structure until it is too late to avoid it. In other cases, navigation may be disrupted by underwater sound (Russell, 2005). On the other hand, offshore structures are suitable stopover perches for most species (Russell, 2005). Due to the limited scope and short duration of installation activities described in this EP and the low density of Black-capped Petrels in the Gulf of America, no significant impacts are expected.

Impacts of Support Vessel and Helicopter Traffic

Support vessels and helicopters are unlikely to significantly disturb Black-capped Petrels in open, offshore waters. Schwemmer et al. (2011) showed that several marine bird species showed behavioral responses and altered distribution patterns in response to ship traffic, which could potentially cause loss of foraging time and resting habitat. However, it is likely that individuals would experience, at most, only short-term behavioral disruption, and the impact would not be significant on Black-capped Petrels.

Impacts of a Small Fuel Spill

Potential spill impacts on marine birds in general are discussed by BOEM (2017). For this EP, there are no unique site-specific issues with respect to spill impacts on Black-capped Petrels.

The probability of a fuel spill is expected to be minimized by Anadarko's preventative measures during routine operations, including fuel transfer procedures. In the unlikely event of a spill, implementation of Anadarko's OSRP is expected to reduce the potential for impacts on Black-capped Petrels. EP Section H provides details 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 Black-capped Petrels 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% would be evaporated or dispersed naturally within 24 hours (NOAA, 2022a). 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.

Black-capped Petrels exposed to 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. 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 Black-capped Petrels, the small area affected, and the brief duration of the surface slick, minimal if any impacts would be expected.

Impacts of a Large Oil Spill

Potential spill impacts on marine and pelagic birds in general are discussed by BOEM (2017). For this EP, there are no unique site-specific issues with respect to spill impacts on Black-capped Petrels.

Black-capped Petrels could be exposed to oil from a spill at the project area; the number of individuals that could be affected in open, offshore waters would depend on the extent and persistence of the oil slick and the number of Black-capped Petrels in the area.

Following the *Deepwater Horizon* incident in 2010, no Black-capped Petrels were reported as oiled or recovered dead (USFWS, 2023b), but decomposition would likely have made positive identification difficult (Haney et al., 2014). 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, 2016). Other indirect impacts would also likely occur after a large oil spill, such as a reduction in suitable foraging habitat and the decline in population of prey species (USFWS, 2023b).

Overall, a large oil spill could cause significant impacts on Black-capped Petrel populations if there were numerous individuals in the area of the spill. However, due to the low number of individuals thought to frequent the northern Gulf of America, significant impacts on this species from a large spill is considered unlikely.

C.3.9 Rufa Red Knot (Threatened)

The Rufa Red Knot is a small to medium-sized migratory shorebird that transits each year between breeding grounds in Canada to wintering grounds in the southeast U.S., Caribbean, and along the Gulf of America coast (USFWS, 2020). Listed as Threatened under the ESA in 2015, their primary habitat during the winter along the Gulf of America is in the Laguna Madre estuary system in Mexico and Texas.

The primary threats that are faced by Rufa Red Knot include habitat loss, reduced food availability, and alterations of their migratory timing and patterns due to climate and weather conditions (USFWS, 2020). Precise population numbers are difficult to assess, but USFWS estimated in 2023 that the global population was approximately 42,000 individuals (The Wildlife Society, 2023). Critical habitat was proposed by USFWS in 2023 which includes numerous areas along the U.S. Gulf of America coastline.

IPFs that potentially may affect the Rufa Red Knots include support vessel and helicopter traffic; and two types of accidents (a small fuel spill and a large oil spill). Drilling rig presence, underwater sound, and lights, and effluent discharges are not expected to have a significant impact because this species typically is not found in offshore waters and instead is more coastal in nature. The IPFs with potential impacts listed in **Table 2** are discussed below.

Impacts of Support Vessel and Helicopter Traffic

Support vessels and helicopters are unlikely to significantly disturb Rufa Red Knots in offshore waters where they are not common or in nearshore industrial areas near the shorebase. Schwemmer et al. (2011) showed that several marine bird species showed behavioral responses and altered distribution patterns in response to ship traffic, which could potentially cause loss of foraging time and resting habitat. However, it is likely that individuals 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 coastal birds in general are discussed by BOEM (2017). For this EP, there are no unique site-specific issues with respect to spill impacts on Rufa Red Knots.

The probability of a fuel spill is expected to be minimized by Anadarko's preventative measures during routine operations, including fuel transfer procedures. In the unlikely event of a spill, implementation of Anadarko's is expected to reduce the potential for impacts on Black-capped Petrels. EP Section H provides details on spill response measures. Given Rufa Red Knots are mostly found in coastal areas and the expected short duration of a small fuel spill, the potential exposure period for Rufa Red Knots would be brief.

A small fuel spill in coastal 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% would be evaporated or dispersed naturally within 24 hours (NOAA, 2022a). 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.

Rufa Red Knots exposed to 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. 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. It is not expected that a small fuel spill would substantially affect Rufa Red Knot populations.

Impacts of a Large Oil Spill

Potential spill impacts on coastal birds in general are discussed by BOEM (2017). For this EP, there are no unique site-specific issues with respect to spill impacts on Rufa Red Knots.

Rufa Red Knots could be exposed to oil from a spill at the project area that travels into coastal area; the number of individuals that could be affected would depend on the extent and persistence of the oil slick and the number of Rufa Red Knots in the area, which is largely seasonally based.

Following the *Deepwater Horizon* incident in 2010, only a single Rufa Red Knot was reported as oiled (USFWS, 2020), but decomposition would likely have made positive identification difficult (Haney et al., 2014). Exposure of marine and coastal 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, 2016). Other indirect impacts would also likely occur after a large oil spill, such as a reduction in suitable foraging habitat and the decline in population of prey species (USFWS, 2023b).

Overall, a large oil spill could cause significant impacts on Rufa Red Knot populations if there were numerous individuals in the area of the spill or in coastal areas that became oiled.

C.3.10 Oceanic Whitetip Shark (Threatened)

The oceanic whitetip shark was listed as Threatened under the ESA on 30 January 2018 (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 historically were one of the most widespread and abundant species of shark (Rigby et al., 2019; Young and Carlson, 2020). However, based on reported oceanic whitetip shark catches in several major longline fisheries, the global population appears to have suffered substantial declines (Camhi et al., 2008) and the species is now only occasionally reported in the Gulf of America (Rigby et al., 2019).

Oceanic whitetip shark management is complex due to the species being globally distributed, highly migratory, and its range overlapping in areas of high fishing pressure; thus, leaving assessment of population trends on fishery dependent catch-and-effort data rather than scientific surveys (Young and Carlson, 2020). A comparison of historical shark catch rates in the Gulf of America by Baum and Myers (2004) noted that most recent papers dismissed the oceanic whitetip shark as rare or absent in the Gulf of America. NMFS (2025a) noted that there has been an 88% decline in abundance of the species in the Gulf of America since the mid-1990s due to commercial fishing pressure.

IPFs that could affect the oceanic whitetip shark include drilling rig presence, underwater sound, and lights, and a large oil spill. Though NMFS (2025a) lists a small diesel fuel spill as an IPF, in the project area, a small diesel fuel spill 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. Therefore, no significant impacts are expected from small diesel fuel spills, and they are not discussed further.

Impacts of Drilling Rig Presence, Underwater Sound, and Lights

Drilling activities produce a broad array of sounds at frequencies and intensities that may be detected by sharks including the Threatened oceanic whitetip shark. The general frequency range for elasmobranch hearing is approximately between 20 Hz and 1 kHz (Ladich and Fay, 2013) which includes sensitivities for individual species to SPLs between approximately 134 to 148 dB re 1 µPa in nurse sharks (*Ginglymostoma cirratum*) at frequencies between 100 and 1,000 Hz (Casper and Mann, 2006). These frequencies overlap with sound associated with the DP vessels for the proposed drilling activities (SPL source levels of 195 dB re 1 µPa m with peak frequencies at 40 to 100 Hz) (Hildebrand, 2005). Impacts from DP vessel activities (i.e., non-impulsive sound) associated with drilling operations could include masking or behavioral changes (Popper et al., 2014). The scientific understanding of shark sound production and behavior is in its infancy, as a smooth-hound shark (*Mustelus lenticulatus*) was found to produce sounds, the first evidence of shark sound production in the scientific literature (Nieder et al., 2025).

Behavioral impacts from offshore drilling activities are consistent with the results of the assessment in the NMFS Biological Opinions (NMFS, 2020a, 2025a) which indicate that oceanic whitetip sharks may be able to detect DP vessel sound but are not likely to be adversely affected by it due to their lack of a swim bladder. Therefore, because the propagation distances of SPL sufficient to elicit behavioral disturbances from the drilling rig would be limited in geographic scope, no population-level impacts on oceanic whitetip sharks are expected.

Impacts of a Large Oil Spill

Information regarding the direct effects of oil on elasmobranchs, including the oceanic whitetip shark, is largely unknown. However, in the event of a large oil 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 oil 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 America, it is unlikely that a large spill would result in population-level effects.

C.3.11 Giant Manta Ray (Threatened)

The giant manta ray is a Threatened elasmobranch species that is a slow-growing, migratory, planktivorous species than inhabits tropical, subtropical, and temperate bodies of water worldwide (NOAA, 2018). The giant manta ray became listed as Threatened under the ESA in 2018.

Commercial fishing is the primary threat to giant manta rays (NOAA, 2018). The species is targeted and caught as bycatch in several global fisheries throughout its range. Although protected in U.S. waters, protection of populations is difficult as they are highly migratory with sparsely distributed and fragmented populations throughout the world. Some estimated regional population sizes are small (between 100 to 1,500 individuals) (Marshall et al., 2018; NOAA, 2018). Stewart et al. (2018) recently reported that the Flower Garden Banks serves as nursery habitat for aggregations of juvenile manta rays. At least 74 unique individuals have been positively identified at the Flower Garden Banks based on unique underbelly coloration (Flower Garden Banks National Marine Sanctuary, 2018). Genetic and photographic evidence in the Flower Garden Banks over 25 years of monitoring showed that 95% of identified giant manta ray male individuals were smaller than mature size (Stewart et al., 2018).

IPFs that may impact giant manta rays include drilling rig presence, underwater sound, and lights, and a large oil spill. Though NMFS (2025a) lists a small diesel fuel spill as an IPF, in the project area a small diesel fuel spill would be unlikely to affect giant manta rays due to rapid natural dispersion of diesel fuel and the low density of giant manta rays potentially present. Therefore, no significant impacts are expected from a small diesel fuel spill.

Impacts of Drilling Rig Presence, Underwater Sound, and Lights

Drilling activities produce a broad array of sounds at frequencies and intensities that may be detected by elasmobranchs including the threatened giant manta ray. The general frequency range for elasmobranch hearing is approximately between 20 Hz and 1 kHz (Ladich and Fay, 2013). Studies indicate sensitivities to SPLs between approximately 139 and 153 dB re 1 μPa in yellow stingray (*Urobatis jamaicensis*) and SPLs between approximately 120 and 145 dB re 1 μPa in little skate (*Erinacea raja*) at frequencies from 100 to 1,000 Hz (Casper et al., 2003; Casper and Mann, 2006). These frequencies overlap with sound associated with DP vessel activities (SPL source levels of 195 dB re 1 μPa m with peak frequencies at 40 to 100 Hz) (Hildebrand, 2005). Impacts from DP vessel activities (i.e., non-impulsive sound) associated with drilling operations could include masking or behavioral changes (Popper et al., 2014).

The scientific understanding of skate and ray (Batoidea) is in its infancy. Only recently has evidence been presented for active sound production in skates and rays, and only in three species (Almagro and Barría, 2024; Barroil et al., 2024; Fetterplace et al., 2022). Potential behavioral changes subsequent to drilling activities are consistent with the results of the assessment in the NMFS Biological Opinion (NMFS, 2020a, 2025a) which indicate that giant manta rays may be able to detect vessel sound but are not likely to be adversely affected by it due to their lack of a swim bladder. Therefore, because the propagation distances of SPL sufficient to elicit behavioral disturbances from the drilling rig would be limited in geographic scope, no population-level impacts on giant manta rays are expected.

Impacts of a Large Oil Spill

A large oil spill could reach coral reefs 73 mi (117 km) from the project area at the Flower Garden Banks which is the only known location of giant manta ray aggregations in the Gulf of America, although individuals may occur anywhere in the Gulf. In the unlikely event of a large oil spill impacting areas with giant manta rays, individual rays could be affected by direct ingestion of oil which could cover their gill filaments or gill rakers, or by ingestion of oiled plankton. Giant manta rays typically feed in shallow waters of less than 33 ft (10 m) depth (NOAA, 2018). Because of this shallow water feeding behavior, giant manta rays would be more likely to be impacted by floating oil than other species which most typically reside at depth.

In the event of a large oil spill, due to the distance between the project area and the Flower Garden Banks, it is unlikely that oil would impact the threatened giant manta ray nursery habitat. It is possible that a large oil spill could contact individual giant manta rays, but due to the low density of individuals thought to occur in the Gulf of America, there would not likely be any population-level impacts.

C.3.12 Gulf Sturgeon (Threatened)

The Gulf sturgeon 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 ocean 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, 2025d) (**Figure 4**). A species description is presented by BOEM (2012a) and in the recovery plan for this species (USFWS et al., 1995).

A large oil spill is the only IPF that potentially may 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 dissipating (see explanation in **Section A.9.1**). Vessel strikes to Gulf sturgeon would be unlikely based on the location of the shorebase and that NMFS (2025a) estimated one non-lethal Gulf sturgeon strike in the 45 years of proposed action. Due to the distance of the project area from the nearest Gulf Sturgeon critical habitat (192 mi [309 km]) and the shorebase being in Port Fourchon, Louisiana, it is anticipated impacts from vessel strikes due to project activities will be negligible.

Impacts of a Large Oil Spill

Potential spill impacts on Gulf sturgeon are discussed by NMFS (2020a) and BOEM (2012a, 2017a). For this EP, there are no unique site-specific issues with respect to this species.

The project area is approximately 192 mi (309 km) from the nearest Gulf sturgeon critical habitat. The 30-day OSRA modeling (**Table 3**) predicts that a spill in the project area has a <0.5% conditional probability of contacting any coastal areas containing Gulf sturgeon critical habitat within 30 days. The 60-day OSRA modeling (**Table 4**) predicts that a spill in the project areas has a 1% 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, subadult and adult Gulf sturgeon would be most vulnerable to an estuarine or marine oil spill, and would be vulnerable from approximately October through April when this species is foraging in estuarine and shallow marine habitats (NMFS, 2020a, 2021). If oil contacted Gulf sturgeon habitat, deaths of individual fish could be significant at the species level.

C.3.13 Nassau Grouper (Threatened)

The Nassau grouper is a Threatened, long-lived reef fish typically associated with hard bottom structures such as natural and artificial reefs, rocks, and underwater ledges (NOAA, 2025).

Once one of the most common reef fish species in the coastal waters of the United States and Caribbean (Sadovy, 1997), the Nassau grouper has been subjected to overfishing and is considered extinct in much of its historical range. Observations of current spawning aggregations compared with historical landings data suggest that the Nassau grouper population is substantially smaller than its historical size (NOAA, 2025). The Nassau grouper was listed as Threatened under the ESA in 2016 (81 FR 42268).

Nassau groupers are found mainly in the shallow tropical and subtropical waters of eastern Florida, the Florida Keys, Bermuda, the Yucatán Peninsula, and the Caribbean, including the U.S. Virgin Islands and Puerto Rico in water depths up to 426 ft (130 m) (NOAA, 2025). There has been one confirmed sighting of Nassau grouper from the Flower Garden Banks in the Gulf of America at a water depth of 118 ft (36 m) (Foley et al., 2007). Three additional unconfirmed reports (i.e., lacking photographic evidence) of Nassau grouper have also been documented from mooring buoys and the coral cap region of the West Flower Garden flats (Foley et al., 2007).

There are no IPFs associated with routine project activities that could affect Nassau grouper. A small fuel spill would not affect Nassau grouper because the fuel would float and dissipate on the sea surface and would not be expected to reach the Flower Garden Banks or Florida Keys. A large oil spill is the only relevant IPF.

Impacts of a Large Oil Spill

Based on the 60-day OSRA modeling results (**Table 4**), a large oil spill would be unlikely (<0.5% probability) to reach Nassau grouper habitat in the Florida Keys (Monroe County, Florida). A spill would be unlikely to contact the Flower Garden Banks based on the distance between the project area and the Flower Garden Banks (73 mi [117 km]) and the difference in water depth between the project area and the Banks. While on the surface, oil would not be expected to contact subsurface fish.

In the unlikely event that oil contacts Nassau grouper habitat, oil droplets or contaminated sediment particles could come into contact with Nassau grouper present on the reefs. Individual fish could be affected by direct ingestion of oil which could cover their gill filaments or gill rakers, resulting in ingestion of oiled prey, or the absorption of dissolved petroleum products through the gills. Due to low population numbers, deaths of individual fish could be significant at the species level.

C.3.14 Smalltooth Sawfish (Endangered)

The smalltooth sawfish, named due to their flat, saw-like rostrum, is an elasmobranch ray which lives in shallow coastal tropical seas and estuaries where they feed on fish and invertebrates such as shrimp and crabs (NMFS, 2025e). Once found along most of the northern Gulf of America coast from Texas to Florida, their current range in Gulf of America is restricted to areas primarily in southwest Florida (Brame et al., 2019) where several areas of critical habitat have been designated (**Figure 4**). A species description is presented in the recovery plan for this species (NMFS, 2009b).

Listed as Endangered under the ESA in 2003, population numbers have drastically declined over the past century primarily due to accidental bycatch (Seitz and Poulakis, 2006). Although there are no reliable estimates for smalltooth sawfish population numbers throughout its range (NMFS, 2018b), data from 1989 to 2004 indicated a slight increasing trend in population numbers in Everglades National Park during that time period (Carlson et al., 2007). More recent data resulted in a similar conclusion, with indications that populations were stable or slightly increasing in southwest Florida (Carlson and Osborne, 2012).

There are no IPFs associated with routine project activities that could affect smalltooth sawfish. A small fuel spill would not affect smalltooth sawfish because the fuel would float and dissipate on the sea surface and would not be expected to reach smalltooth sawfish habitat in coastal areas (see **Section A.9.1**). A large oil spill was not considered an IPF for smalltooth sawfish in the 2025 NMFS Biological Opinion (NMFS, 2025a) but is briefly considered below.

Impacts of a Large Oil Spill

The project area is approximately 534 mi (859 km) from the nearest smalltooth sawfish critical habitat in Charlotte County, Florida. Based on the 30-day OSRA modeling (**Table 3**), coastal areas containing smalltooth sawfish critical habitat are unlikely to be affected within 30 days of a spill (<0.5% conditional probability). The 60-day OSRA modeling (**Table 4**) predicts a <0.5% probability of shoreline contact within 60 days of a spill to coastal areas containing smalltooth sawfish critical habitat.

Information regarding the direct effects of oil on elasmobranchs, including the smalltooth sawfish is largely unknown. A study by Cave and Kajiura (2018) reported that when exposed to crude oil, the Atlantic stingray (*Hypanus sabinus*) experienced impaired olfactory function which could lead to decreased fitness. In the event of oil reaching smalltooth sawfish habitats, the smalltooth sawfish could be affected by direct ingestion, ingestion of oiled prey, or the absorption of dissolved petroleum products through the gills as well as impaired olfactory function. Based on the shallow, coastal habitats preferred by smalltooth sawfish, individuals in areas subject to coastal oiling could be more likely to be impacted than other species that reside at depth. Due to low population numbers, deaths of individual fish could be significant at the species level.

C.3.15 Beach Mice (Endangered)

Four subspecies of endangered beach mouse occur on the barrier islands of Alabama and the Florida Panhandle. They are the Alabama (*Peromyscus polionotus ammobates*), Choctawhatchee (*Peromyscus polionotus allophrys*), Perdido Key (*Peromyscus polionotus trissyllepsis*), and St. Andrew beach mouse (*Peromyscus polionotus peninsularis*). Critical habitat has been designated for all four subspecies; **Figure 4** shows the critical habitat combined for all four subspecies. One additional species of beach mouse inhabiting dunes on the western Florida Panhandle, the Santa Rosa beach mouse (*Peromyscus polionotus leucocephalus*), is not listed under the ESA.

A large oil 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 dissipating (see **Section A.9.1**).

Impacts of a Large Oil Spill

Potential spill impacts on beach mice are discussed by BOEM (2017a, 2023a,b). For this EP, 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 267 mi (430 km) from the project area. The 30-day OSRA results (**Table 3**) predicts a <0.5% conditional probability of oil contact with beach mouse critical habitat within 30 days of a spill. The 60-day OSRA modeling (**Table 4**) predicts that a spill in the project area has a 1% or less conditional probability of contacting any coastal areas containing beach mouse critical habitat within 60 days of a spill.

In the event of oil 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.3.16 Florida Salt Marsh Vole (Endangered)

The Florida salt marsh vole is a small, dark brown or black rodent found only in saltgrass (*Distichlis spicata*) meadows in the Big Bend region of Florida that was listed as Endangered under the ESA in 1991. Only two populations of Florida salt marsh vole are known to exist: one near Cedar Key in Levy County, Florida and one in the Lower Suwanee National Wildlife Refuge in Dixie County, Florida (Florida Fish and Wildlife Conservation Commission, nd-d). No critical habitat has been established for the Florida salt marsh vole in part due to concerns over illegal trapping or trespassing if the location of the populations were publicly disclosed (USFWS, 2001b).

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

Impacts of a Large Oil Spill

Florida salt marsh vole habitat in Levy and Dixie counties, Florida is approximately 492 mi (792 km) from the project area. The 30-day OSRA modeling (**Table 3**) predicts that a spill in the project area has a <0.5% conditional probability of contacting any coastal areas containing Florida salt marsh voles within 30 days. The 60-day OSRA modeling (**Table 4**) predicts that a spill in the project area has <0.5% conditional probability of contacting any coastal areas containing Florida salt marsh vole habitat within 60 days of a spill.

In the event of oil contacting beaches containing these animals, Florida salt marsh voles 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. Impacts associated with an extensive oiling of coastal habitat containing Florida salt marsh voles from a large oil spill are expected to be significant. Due to the extremely low population numbers, extensive oiling of Florida salt marsh vole habitat could result in the extinction of the species. However, any such impacts are unlikely due to the distance from the project area to Florida salt marsh vole habitat and response actions that would occur in the event of a spill.

C.3.17 Panama City Crayfish

The USFWS issued a Final Rule designating the Panama City crayfish as Threatened under the ESA on 5 January 2022 (effective 4 February 2022). The Panama City crayfish is a semi-terrestrial crayfish that grows up to 2 inches (51 mm) in size and is found in south-central Bay County, Florida. Medium to dark brown in color, the crayfish prefers areas dominated by herbaceous vegetation and shallow or fluctuating water levels (Keppner and Keppner, 2004). Historically prevalent in shallow freshwater bodies in pine and prairie communities, urban development has largely replaced these habitats. The Panama City crayfish is now generally found in wet or semi-wet swales, ditches, slash pine plantations, undeveloped utility rights-of-way, and remnant wetlands (Florida Fish and Wildlife Conservation Commission, 2016).

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

Impacts of a Large Oil Spill

Panama City crayfish critical habitat in Bay County, Florida is approximately 373 mi (600 km) from the project area. The 30-day OSRA modeling (**Table 3**) predicts that a spill in the project area has <0.5% conditional probability of contacting any coastal areas containing Panama City crayfish critical habitat within 30 days. The 60-day OSRA modeling (**Table 4**) predicts that a spill in the project area has 1% or less conditional probability of contacting any coastal areas containing Panama City crayfish critical habitat within 60 days of a spill.

Effects of oiling on the Panama City crayfish are largely unknown. In general, crayfishes use chemoreception to orient themselves in their environment, to find food, and to avoid predators (Bergman and Moore, 2005). Exposure to hydrocarbons has been shown to damage receptor cells that crayfish use for chemoreception, thus decreasing their fitness (Tierney et al., 2010). Indirect impacts of oiling of Panama City crayfish habitat could include reduction of food supply, destruction of habitat, and fouling of burrows. Impacts could also occur from vehicular traffic and other activities associated with spill cleanup. Impacts associated with an extensive oiling of coastal habitat containing Panama City crayfish from a large oil spill are expected to be significant. Due to the low population numbers and restricted range, extensive oiling of Panama City crayfish habitat could be significant at the species level. However, any such impacts are unlikely due to the distance from the project area to Panama City crayfish habitat and response actions that would occur in the event of a spill.

C.3.18 Threatened Coral Species

Seven Threatened coral species are known from the northern Gulf of America: elkhorn coral, staghorn coral, lobed star coral, mountainous star coral, boulder star coral, and rough cactus coral. One Endangered coral specie (pillar coral) is also known to occur in the northern Gulf of America. Elkhorn coral, lobed star coral, mountainous star coral, and boulder star coral have been reported from the coral cap region of the Flower Garden Banks (NOAA, 2014), but are unlikely to be present with a widespread distribution in the northern Gulf of America because they typically inhabit coral reefs in shallow, clear tropical, or subtropical waters. Staghorn coral, pillar coral, and rough cactus coral are only known from the Florida Keys and Dry Tortugas (Florida Fish and Wildlife Conservation Commission, nd-e). 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, Florida Keys, or Dry Tortugas.

Critical habitat has been designated for elkhorn coral and staghorn coral in the Florida Keys (Monroe County, Florida) and Dry Tortugas. A species description of elkhorn coral is presented in the recovery plan for the species (NMFS, 2015).

NMFS has designated critical habitat for the boulder star coral, lobed star coral, mountainous star coral, pillar coral, and rough cactus coral in the Atlantic Ocean, Gulf of America, and Caribbean Sea per 88 FR 54026 and became effective in September 2023. For the areas in the Gulf of America, this includes the Flower Garden Banks and the waters near Miami-Dade and Monroe counties, Florida, and the Dry Tortugas (**Figure 4**).

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

Impacts of a Large Oil Spill

Based on the 60-day OSRA modeling results (**Table 4**), a large oil spill would be unlikely (<0.5% probability) to reach elkhorn or staghorn 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, and the difference in water depth between the project area and the Banks. While on the surface, oil would not be expected to contact corals on the seafloor. Natural or chemical dispersion of oil could cause a subsurface plume which would have the possibility of contacting seafloor corals.

If a subsurface plume were to occur, impacts on the Flower Garden Banks would be unlikely due to the distance between the project area and corals within the Flower Garden Banks (approximately 73 mi [117 km]), and the shallow location of the coral cap of the Banks. Near-bottom currents in the region are predicted to flow along the isobaths (Nowlin et al., 2001) and typically would not carry a plume up onto the continental shelf edge. Valentine et al. (2014)

observed the spatial distribution of excess hopane, a crude oil tracer from *Deepwater Horizon* spill sediment core samples, to be in the deeper waters and not transported up the shelf, thus confirming that near-bottom currents flow along the isobaths.

In the unlikely event that an oil slick reached reefs at the Flower Garden Banks or other Gulf of America reefs, oil droplets or oiled sediment particles could come into contact with reef organisms or corals. As discussed by BOEM (2017a), 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. Sublethal effects could be long-lasting and affect the resilience of coral colonies to natural disturbances (e.g., elevated water temperature, diseases) (BOEM, 2017a).

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

C.3.19 Queen Conch (Threatened)

The queen conch is a large gastropod that occurs throughout the Caribbean Sea, Gulf of America, and in the waters around Bermuda which was listed as Threatened under the ESA in 2024 (NOAA, 2026). The species is slow moving and found in a variety of habitats including seagrass beds, sands flats, algal beds, and rubble areas up to 30 m (98.4 ft) in water depth. Larval conch feed primarily on phytoplankton, while juvenile and adults feed on a mix of seagrass and macroalgae (Stoner and Appeldoorn, 2022). Overall, the population of queen conch is declining, largely due to overfishing and illegal fishing practices. Exact population numbers are unknown due to the difficulty in obtaining accurate counts. The majority of available density estimates suggest that conch populations are below minimum thresholds necessary to maintain or increase populations (Horn et al., 2022).

There are no IPFs associated with routine project activities that could affect queen conch. A small fuel spill would not affect queen conch because the fuel would float and dissipate on the sea surface. A large oil spill is the only relevant IPF.

Impacts of a Large Oil Spill

A large oil spill in the project area could potentially reach queen conch habitat and affect the substrate. These effects would be of particular concern where the species occurs in shallower waters. There is some information available on the effects of oil spills on seagrass meadows and other marine gastropods, but little information available on the direct effects of oil on queen conch (Horn et al., 2022). In the event of a large oil spill, due to the low density of individual queen conch thought to occur in the Gulf of America, any population-level impacts are considered unlikely.

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,b; 1983; Davis and Fargion, 1996; Davis et al., 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 America were surveyed from ships during the GulfCet II program (Davis et al., 2000) which reported that terns, storm-petrels, shearwaters, and jaegers were the most frequently sighted seabirds in deepwater areas of the Gulf of America. 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 [*Onychoprion fuscatus*], Least Tern [*Sternula antillarum*], Sandwich Tern [*Thalasseus sandvicensis*], Magnificent Frigatebird [*Fregata magnificens*]); winter residents (gannets, gulls, jaegers); and permanent resident species (Laughing Gulls [*Leucophaeus atricilla*], Royal Terns [*T. maximus*], Bridled Terns [*Onychoprion anaethetus*]) (Davis et al., 2000).

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

Relationships with hydrographic features were found for several marine bird 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, Haney et al. (2014) indicated that marine bird densities over the open ocean were estimated to be 1.6 birds km^{-2}.

Trans-Gulf migrant birds including shorebirds, wading birds, and terrestrial birds may also 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 drilling rig presence, underwater sound, and lights; support vessel and helicopter traffic; and two types of accidents (a small fuel spill and a large oil 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 Drilling Rig Presence, Underwater Sound, and Lights

Marine birds that frequent offshore vessels 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 an offshore structure until it is too late to avoid it. In other cases, navigation may be disrupted by underwater 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 drilling activities described in this EP, any impacts on populations of either seabirds or trans-Gulf migrant birds are not expected to be significant.

A study in the North Sea indicated that rig lighting causes circling behavior in various birds, especially on cloudy nights. The study suggests that the birds' geomagnetic compass is upset by the red part of the spectrum from the lights currently in use (Van de Laar, 2007; Poot et al., 2008). The numbers varied greatly, from none to some tens of thousands of birds per night per rig, with an apparent effect radius of up to 3 mi (5 km) (Poot et al., 2008). A study in the Gulf of America also noted the phenomenon but did not recommend mitigation (Russell, 2005). One factor to consider in evaluating this impact in the Gulf of America would include the lower incidence of cloudy and foggy days in the Gulf of America versus the North Sea. In laboratory experiments, Poot et al. (2008) found the magnetic compass of migratory birds to be wavelength dependent. Migratory birds require light from the blue-green part of the spectrum for magnetic compass orientation, whereas red light (visible long-wavelength) disrupts their magnetic orientation. They designed a field study to test if and how changing light color influenced migrating birds under field conditions. During field studies they found that nocturnally migrating birds were disoriented and attracted by red and white light (containing visible long-wavelength radiation), whereas they were clearly less disoriented by blue and green light (containing less or no visible long-wavelength radiation) (Poot et al., 2008).

Overall, potential negative impacts to birds from drilling rig lighting, collisions, or other adverse effects are highly localized (considering the single structure) and may affect individual birds during migration periods. Therefore, these potential impacts are not expected to affect marine birds at the population or species level and are not significant.

Impacts of Support Vessel and Helicopter Traffic

Support vessels and helicopters are unlikely to significantly disturb marine birds in open, offshore waters. Schwemmer et al. (2011) showed that several marine bird species showed behavioral responses and altered distribution patterns in response to ship traffic, which could potentially cause loss of foraging time and resting habitat. However, 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). For this EP, 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 Anadarko's preventative measures during routine operations, including fuel transfer procedures. In the unlikely event of a spill, implementation of Anadarko's OSRP is expected to reduce the potential for impacts on marine birds. EP Section H provides details 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 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% would be evaporated or dispersed naturally within 24 hours (NOAA, 2022a). 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.

Marine birds exposed to oil 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. 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 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 Oil Spill

Potential spill impacts on marine and pelagic birds are discussed by BOEM (2017a). For this EP, 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. Davis et al. (2000) reported that terns, storm-petrels, shearwaters, and jaegers were the most frequently sighted seabirds in the deepwater (>200 m) Gulf of America. Haney et al. (2014) estimated that seabird densities over the open ocean were approximately 1.6 birds km^{-2}. 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 collected following the *Deepwater Horizon* incident provides relevant information about the species of pelagic birds that may be affected in the event of a large oil spill. Birds that were treated for oiling included several pelagic species such as the Northern Gannet, Magnificent Frigatebird, and Masked Booby (USFWS, 2011). The Northern Gannet was 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, 2016). In the event of large-scale oiling, significant impacts at the species level are not expected due to the non-endangered status of most species of marine birds.

C.4.2 Coastal Birds

Threatened and Endangered bird species (Piping Plover, Whooping Crane, and Rufa Red Knot) have been discussed previously in **Sections C.3.6**, **C.3.7**, and **C.3.9**. Various species of non-endangered birds are also found along the northern Gulf Coast, including diving birds, shorebirds, marsh birds, wading birds, and waterfowl. Gulf Coast marshes and beaches also 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 (*Charadrius wilsonia*), Black Skimmer (*Rynchops niger*), Forster's Tern

(*Sterna forsteri*), Gull-Billed Tern (*Gelochelidon nilotica*), Laughing Gull, Least Tern, and Royal Tern (Burger, 2017).

The Brown Pelican (*Pelecanus occidentalis*) was delisted from Federal Endangered status in 2009 (USFWS, 2016b) and was delisted from state species of special concern status by the State of Florida in 2017 (Florida Fish and Wildlife Conservation Commission, 2025) and Louisiana (Louisiana Wildlife and Fisheries, 2020). However, this species remains listed as Endangered by Mississippi (Mississippi Natural Heritage Program, 2023). 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; Davis and Fargion, 1996; Davis et al., 2000).

The 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 America. 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 oil spill. A small fuel spill in the project area would be unlikely to affect shorebirds or coastal nesting birds, as the project area is 119 mi (192 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 dissipating. 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; Schwemmer et al., 2011). The disturbances will be limited to flushing birds away from vessel pathways; known distances are from 65 to 160 ft (20 to 49 m) for personal watercrafts and 75 to 190 ft (23 to 58 m) 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.

Helicopter 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 (Efroymson 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 2,000 ft (610 m) when flying over underwater sound-sensitive areas such as parks, forest, primitive areas, wilderness areas, National Seashores, or National Wildlife Refuges, and maintain flight paths to reduce aircraft underwater sound in these underwater sound-sensitive areas. The 2,000 ft (610 m) 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). It is assumed that adherence to these guidelines would reduce potential behavioral disturbances (such as temporary displacement or avoidance behavior) of individual birds in coastal and inshore areas. The potential impacts from helicopter traffic are not expected to be significant to coastal bird populations or species in the project area.

Impacts of Large Oil Spill

Based on the 30-day OSRA modeling (**Table 3**), Cameron Parish in Louisiana is the coastal area most likely to be affected (4% probability within 30 days). Within 30 days, shoreline segments of six Louisiana parishes and five Texas counties have a probability of 1% to 4% of being contacted. Based on the 60-day OSRA modeling estimates (**Table 4**), the potential for shoreline contact ranges from Cameron County, Texas to Miami-Dade County, Florida (up to 13% conditional probability within 60 days).

Coastal birds can be exposed to oil as they float on the water surface, dive during foraging, or wade in oiled coastal waters. Oil interferes with the water repellency of feathers and can cause hypothermia in the right 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 oil 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 (*Pelecanus erythrorhynchos*) 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 is 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 scooping 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 oil or an oil 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).

Coastal fishing birds of prey such as bald eagles, ospreys, etc. may also be at risk from direct and indirect impacts from spilled oil. These species often capture 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 oil 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 America. 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 America (Biggs and Ressler, 2000).

Most fishes inhabiting shelf or oceanic waters of the Gulf of America have planktonic eggs and larvae (Ditty, 1986; Ditty et al., 1988; Richards et al., 1989; Richards et al., 1993). Recent ichthyological work has been shedding light on the mobility of ichthyological larvae: for example, work from Shiroza et al. (2022) has demonstrated that bluefin tuna larvae (*Thunnus thynnus*), even <10 mm standard length, have mobility significant enough that they are able to pursue prey, refuting the classic assumption that fish larvae are planktonic. Larvae may be more capable of avoiding certain impacts than previously expected. However, larval mobility is still poorly understood across fish species, and drift is still a major source of distribution of larval tuna (Muhling et al., 2013), and likely for other fishes that occur in this area.

A study by Ross et al. (2012) on mid-water fauna, to characterize vertical distribution of mesopelagic fishes in selected deepwater areas in the Gulf of America, substantiated high species richness but general domination by relatively few families and species. These results were confirmed by Wang et al. (2021) during surveys in the northern Gulf finding that although several families were detected in a survey of the ichthyological larval composition of the northern Gulf in waters from 200 to 1,500 m deep, the larval assemblage was dominated by just four deep-sea finfish families (Myctophidae, Gonostomatidae, Sternoptychidae, Phosichthyidae).

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

Impacts of Drilling Rig Presence, Underwater Sound, and Lights

The drilling rig, 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 America 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. Installation sound 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 non-impulsive sounds are given by Popper et al. (2014) and apply only to species of fish with swim bladders that provide some hearing (pressure detection) function. All fishes can also detect particle motion from substrate-borne vibration, but the scientific understanding of detection thresholds and behavioral responses from particle motion is in its infancy and there are currently no accepted thresholds available (Hawkins et al., 2021).

Popper et al. (2014) estimated SPL threshold levels of 170 dB re 1 µPa over a 48-hour period for onset of recoverable injury and 158 dB re 1 µPa over a 12-hour period for onset temporary auditory threshold shifts. However, no consistent behavioral thresholds for fish for non-impulsive sounds have been established (Hawkins and Popper, 2014), and the current accepted threshold for behavioral disturbances in fish is an SPL of 150 dB re 1 µPa for impulsive sources from the Fisheries Hydroacoustic Working Group (2008). Sound 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). Fish aggregation is likely to occur to some degree due to the presence of the drilling rig, but the impacts would be limited in geographic scope and no population-level impacts are expected.

Few data exist regarding the impacts of sound 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 sound (Popper et al., 2014). Larval fish were experimentally exposed to simulated impulsive sounds by Bolle et al. (2012). The controlled playbacks produced SEL_{24h} of 206 dB re 1 μPa^2 s but resulted in no increased mortality between the exposure and control groups. Non-impulsive sound sources (such as installation operations) are expected to be far less injurious than impulsive sound sources. Because of the periodic and transient nature of ichthyoplankton, they are not expected to remain within the ensonified area for a full 24-hour period to realize SEL_{24h} necessary to result in injury, and 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 water quality, plankton, and nekton 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 water quality, plankton, and nekton are anticipated.

Other discharges in accordance with the NPDES permit, such as desalination unit brine, wash water, blowout preventer fluid, excess cement, uncontaminated cooling water, fire water, cuttings wetted with water-based fluids, water-based drilling fluids, cuttings wetted with synthetic-based drilling fluids, non-pollutant completion/recompletion fluids, ballast water, and bilge water are expected to be diluted rapidly and have little or no impact on pelagic communities.

Impacts of Water Intake

Seawater will be drawn from the ocean for once-through, non-contact cooling of machinery on the drilling rig. 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). The cooling water systems and operating procedures are designed such that a maximum return temperature of the seawater being discharged back into the ocean does not exceed 120°F; thus, minimizing the chance that plankton will be stressed/killed. Due to the limited scope and short duration of installation activities, any short-term impacts of entrainment are not expected to be significant to plankton or ichthyoplankton populations (BOEM, 2017a). The drilling rig 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). For this EP, there are no unique site-specific issues with respect to spill impacts.

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

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 of the release 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% would dissipate naturally within 24 hours (NOAA, 2022a). 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 phytoplankton, zooplankton, and nekton. Determining the impact of a diesel spill on phytoplankton is a complex issue as some phytoplankton species are more tolerant of oil exposure than others (Ozhan et al., 2014). Phytoplankton populations can change quickly on small temporal and spatial scales, making it difficult to predict how a phytoplankton community as a whole will respond to a fuel spill. Due to the limited areal extent and short duration of water quality impacts, a small fuel spill would be unlikely to produce detectable impacts on pelagic communities and ichthyoplankton.

Impacts of a Large Oil Spill

Potential spill impacts on pelagic communities and ichthyoplankton are discussed by BOEM (2017a). A large oil spill could affect water column biota including phytoplankton, zooplankton, ichthyoplankton, and nekton. A large spill that persisted for weeks or months would be more likely to affect these communities. While adult and juvenile fishes may actively avoid a large spill, planktonic eggs and larvae would be unable to avoid contact. 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).

Oil spill impacts to phytoplankton include changes in community structure and increases in biomass, which have been attributed to the effects of oil contamination and of decreased predation due to zooplankton mortality (Abbriano et al., 2011; Ozhan et al., 2014). Ozhan et al. (2014) reported that the formation of oil films on the water surface can limit gas exchange through the air-sea interface and can reduce light penetration into the water column which will limit phytoplankton photosynthesis.

Mortality of zooplankton has been shown to be positively correlated with oil concentrations (Lennuk et al., 2015). Spills that are not immediately lethal can have short- or long-term impacts on biomass and community composition, behavior, reproduction, feeding, growth and development, immune response and respiration (Harvell et al., 1999; Wootton et al., 2003; Auffret et al., 2004; Hannam et al., 2010; Blackburn et al., 2014). Zooplankton are especially vulnerable to acute oil pollution, showing increased mortality and sublethal changes in physiological activities (e.g., egg production; Moore and Dwyer, 1974; Linden, 1976; Lee et al., 1978; Suchanek, 1993). Bioaccumulation of hydrocarbons can lead to additional impacts among those higher trophic level consumers that rely on zooplankton as a food source (Almeda et al., 2013; Blackburn et al., 2014).

Planktonic communities have a high capacity for recovery from the effects of oil spill pollution due to their short life cycle and high reproductive capacity (Abbriano et al., 2011). Planktonic communities drift with water currents and recolonize from adjacent areas. Because of these attributes, plankton usually recover relatively rapidly to normal population levels following hydrocarbon spill events. Research in the aftermath of the *Deepwater Horizon* incident found that phytoplankton population recovered within weeks to months and zooplankton populations may have only been minimally affected (Abbriano et al., 2011).

C.5.2 Essential Fish Habitat

Essential Fish Habitat (EFH) is defined as those waters and substrate necessary to fish for spawning, breeding, feeding, or 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 Council has prepared Fishery Management Plans for corals and coral reefs, shrimps, spiny lobster, reef fishes, coastal migratory pelagic fishes, and red drum (*Sciaenops ocellatus*). 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 Gulf Council managed species is on the continental shelf in waters shallower than 600 ft (183 m). 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 42 mi (68 km) from the project area (**Figure 4**).

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 America. Species in this group, including tunas, swordfishes, billfishes, and sharks, are managed by NMFS. **Table 7** lists the highly migratory fish species and their life stages with EFH at or near the project area.

Table 7. Migratory fish species with designated Essential Fish Habitat (EFH) at or near the project area, including life stage(s) potentially present (Adapted from National Marine Fisheries Service [NMFS], 2009c).

Common Name	Scientific Name	Life Stage(s) Potentially Present Within or Near the Project Area
Albacore tuna	*Thunnus alalunga*	Juveniles, adults
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*	Spawning, eggs, larvae, juveniles, adults
Dusky shark	*Carcharhinus obscurus*	Juveniles, adults
Longbill spearfish	*Tetrapturus pfluegeri*	All
Longfin mako shark	*Isurus paucus*	All
Oceanic whitetip shark	*Carcharhinus longimanus*	All
Sailfish	*Istiophorus spp.*	Spawning, eggs, larvae, juveniles, adults
Scalloped hammerhead shark	*Sphyrna lewini*	Juveniles, adults
Shortfin mako shark	*Isurus oxyrinchus*	All
Silky shark	*Carcharhinus falciformis*	All
Skipjack tuna	*Katsuwonus pelamis*	Spawning, eggs, larvae, juveniles, adults
Swordfish	*Xiphias gladius*	Spawning, eggs, larvae, juveniles, adults
Tiger shark	*Galeocerdo cuvier*	Juveniles, adults
Whale shark	*Rhincodon typus*	All
White marlin	*Tetrapturus albidus*	Juveniles, adults
Yellowfin tuna	*Thunnus albacares*	Spawning, eggs, larvae, juveniles, adults

Research indicates the central and western Gulf of America may be important spawning habitat for Atlantic bluefin tuna (*Thunnus thynnus*), and NMFS (2009c) has designated a Habitat Area of Particular Concern (HAPC) for this species. The HAPC covers much of the deepwater Gulf of America, including the project area (**Figure 4**). The areal extent of the HAPC is approximately 300,000 km^2 (115,831 mi^2). 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 America to spawn in April, May, and June (NMFS, 2009c). The Atlantic bluefin tuna has also been designated as a species of concern (NMFS, 2025c). An amendment to the original EFH Generic Amendment was finalized in 2005 (Gulf of Mexico Fishery Management Council, 2005). One of the most significant proposed 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 Atlantic bluefin tuna spawning area (NMFS, 2009c). The northern Gulf of America in particular contains habitat for the western stock of larval bluefin tuna (Muhling et al., 2013).

NTLs 2009-G39 and 2009-G40 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 America Region and NOAA's Southeastern Region during the preparation, distribution, and review of BOEM's 2024–2029 National OCS Oil and Gas Leasing Program Final Programmatic EIS (BOEM, 2023a).

Other HAPCs to protect corals and coral reefs 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 America. Green Canyon Block 852 is the HAPC located nearest to the project area (approximately 12 mi [19 km]).

IPFs that potentially may affect EFH include drilling rig presence, underwater sound, and lights; effluent discharges; water intake; and two types of accidents (a small fuel spill and a large oil spill).

Impacts of Drilling Rig Presence, Underwater Sound, and Lights

The drilling rig, as a floating structure in the deepwater environment, will act as a FAD with most pronounced effects on epipelagic fishes that include species with EFH designation (Holland, 1990; Higashi, 1994; Relini et al., 1994; Gates et al., 2017). The FAD effect would likely attract and concentrate smaller fish species and thus enhance feeding of epipelagic predators.

Drilling sound could potentially cause acoustic masking for fishes, thereby reducing their ability to hear biologically relevant sounds (Radford et al., 2014). Underwater sound 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). The only defined acoustic threshold levels for non-impulsive sounds are given by Popper et al. (2014) and apply only to species of fish with swim bladders, including some species with EFH designation, that provide some hearing (pressure detection) function. Popper et al. (2014) estimated SPL threshold levels of 170 dB re 1 µPa over a 48-hour period for onset of recoverable injury and SPL of 158 dB re 1 µPa over a 12-hour period for onset temporary auditory threshold shifts. No consistent behavioral thresholds for fish resulting from non-impulsive sound have been established (Hawkins and Popper, 2014) and the most widely recommended behavioral threshold for fish for all sound sources is SPL of 150 dB re 1 µPa as defined by the Fisheries Hydroacoustic Working Group (2008). Because the drilling rig is a temporary structure, any impacts on EFH for managed species are considered negligible.

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, wash water, blowout preventer fluid, excess cement, uncontaminated cooling water, fire water, cuttings wetted with water-based fluids, water-based drilling fluids, cuttings wetted with synthetic-based drilling fluids, non-pollutant completion/recompletion fluids, ballast water, and bilge water. Impacts on water quality have been discussed previously. No detectable impacts on EFH for managed species 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 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 328 ft (100 m) of the discharge pipe. Any impacts to pelagic species would be localized and brief (BOEM, 2014).

Impacts of a Small Fuel Spill

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

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

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 of the release 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% would be dissipated naturally within 24 hours (NOAA, 2022a). 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 the HAPC for spawning bluefin tuna, which covers much of the deepwater Gulf of America. The areal extent of impact from a small fuel spill would represent a negligible portion of the HAPC.

A small fuel spill would not likely affect EFH for corals and coral reefs, the nearest coral EFH is located approximately 42 mi (68 km) from 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 Oil Spill

Potential spill impacts on EFH are discussed by BOEM (2017a, 2023b). For this EP, there are no unique site-specific issues with respect to EFH.

An oil spill in offshore waters would temporarily increase hydrocarbon concentrations on the water surface and potentially in the subsurface as well. Given the extent of EFH designations in the Gulf of America (Gulf of Mexico Fishery Management Council, 2005; NMFS, 2009c), some impact from a large spill on EFH would be unavoidable.

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, 2009c). 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 America to spawn in April, May, and June (NMFS, 2009c).

The nearest features designated as EFH under the corals and coral reefs management plan (Gulf of Mexico Fishery Management Council, 2005) lies 42 mi (68 km) from the project area. 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

GC 679 and 680 are not located in an area designated as having high archaeological potential, and as such, an Archaeological Report is not required per NTL No. 2011-JOINT-G01. However, an Archaeological Report was prepared by and was previously submitted with the Initial EP.

Because there are no known shipwreck sites within 2,000 ft (610 m) of the proposed project activities, there are no routine IPFs that are likely to affect shipwrecks. The only IPF of relevance to shipwrecks is a large oil spill as listed in **Table 2** are discussed below. A small fuel spill would not affect shipwrecks because the fuel would float and dissipate on the sea surface.

Impacts of a Large Oil Spill

The 2017–2022 Lease Sale EIS (BOEM, 2017a) estimated that a severe subsurface blowout could resuspend and disperse sediments within a 984 ft (300 m) radius. Because there are no historic shipwrecks within a 984 ft (300 m) radius of the proposed wellsite, this impact would not be relevant. Should there be any indication that potential shipwreck sites could be affected, in accordance with NTL 2005-G07, Anadarko 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. Following a shipwreck discovery, all operations within 1,000 ft (305 m) of the site would cease until the Regional Supervisor provides instructions on steps to take to protect the site and assess the potential historic significance.

Beyond this 1,000 ft (305 m) radius, there is the potential for impacts from oil, dispersants, and depleted oxygen levels. These impacts could include chemical contamination, alteration of the rates of microbial activity (BOEM, 2017a), and reduced biodiversity at shipwreck-associated sediment microbiomes (Hamdan et al., 2018). During the *Deepwater Horizon* incident, subsurface plumes were reported at a water depth of about 3,600 ft (1,100 m), extending at least 22 mi (35 km) from the wellsite and persisting for more than a month (Camilli et al., 2010). While the behavior and impacts of subsurface plumes are not well known, a subsurface plume could have the potential to contact shipwreck sites beyond the 984 ft (300 m) radius estimated by BOEM (2012a), depending on its extent, trajectory, and persistence.

A spill entering shallow coastal waters could conceivably contaminate an undiscovered or known coastal shipwreck site. Based on the 30-day OSRA modeling (**Table 3**), Cameron Parish in Louisiana is the coastal area most likely to be affected (4% probability within 30 days). Within 30 days, shoreline segments of six Louisiana parishes and five Texas counties have a probability of 1% to 4% of being contacted. Based on the 60-day OSRA modeling estimates (**Table 4**), the potential for shoreline contact ranges from Cameron County, Texas to Miami-Dade County, Florida (up to 13% conditional probability within 60 days).

BOEM (2012a) stated that if an oil spill contacted a coastal historic site, such as a fort or a lighthouse, the major impact would be a visual impact from oil contact and contamination of the site and its environment.

C.6.2 Prehistoric Archaeological Sites

The water depth at the location of the proposed activities (4,652 to 5,405 ft [1,418 to 1,647 m]) is well beyond the 197-ft (60-m) depth contour used by BOEM as the seaward extent for potential prehistoric archaeological sites in the Gulf of America. Because prehistoric archaeological sites are not found in the project area, the only relevant IPF is a large oil 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 Oil Spill

Because prehistoric archaeological sites are not found in the project area, they would not be affected by the physical effects of a subsea blowout. BOEM (2012a) estimated that a severe subsurface blowout could resuspend and disperse sediments within a 984 ft (300 m) radius.

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 3**), Cameron Parish in Louisiana is the coastal area most likely to be affected (4% probability within 30 days). Within 30 days, shoreline segments of six Louisiana parishes and five Texas counties have a probability of 1% to 4% of being contacted. Based on the 60-day OSRA modeling estimates (**Table 4**), the potential for shoreline contact ranges from Cameron County, Texas to Miami-Dade County, Florida (up to 13% conditional probability within 60 days).

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 of organic materials in a site (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., destroying fragile artifacts, disturbing the provenance of artifacts and site features).

C.7 Coastal Habitats and Protected Areas

Coastal habitats in the northeastern Gulf of America that may be affected by oil and gas activities are described by BOEM (2017a) and Mendelssohn et al. (2017). 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 from the support bases at Port Fourchon and Houma, Louisiana that are not in wildlife refuges or wilderness areas. Potential impacts of support vessel traffic are addressed briefly below.

The only other IPF of relevance for coastal habitats and protected areas is an accidental large oil spill. A small fuel spill in the project area would not affect coastal habitats, as the project area is 119 mi (192 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 dissipating. 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 EP Section K, 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).

Impacts of a Large Oil Spill

Potential spill impacts on coastal habitats are discussed by BOEM (2017a, 2023b). Coastal habitats inshore of the project area include barrier beaches and dunes, wetlands, oyster reefs and submerged seagrass beds. For this EP, there are no unique site-specific issues with respect to coastal habitats.

Based on the 30-day OSRA modeling (**Table 3**), Cameron Parish in Louisiana is the coastal area most likely to be affected (4% probability within 30 days). Within 30 days, shoreline segments of six Louisiana parishes and five Texas counties have a probability of 1% to 4% of being contacted. Based on the 60-day OSRA modeling estimates (**Table 4**), the potential for shoreline contact ranges from Cameron County, Texas to Miami-Dade County, Florida (up to 13% conditional probability within 60 days).

NWRs and other protected areas along the coast are discussed in BOEM (2017a) and Anadarko'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 3**) are presented in **Table 8**.

Table 8. Wildlife refuges, wilderness areas, and state and national parks within the geographic range of potential shoreline contacts after 30 days of a hypothetical spill from Launch Area 45 based on the 30-day OSRA model.

County or Parish, State	Wildlife Refuge, Wilderness Area, or State/National Park
Calhoun, Texas	Aransas National Wildlife Refuge
	Chester Island Bird Sanctuary
	Guadalupe Delta Wildlife Management Area
	Matagorda Island Wildlife Management Area
	Welder Flats Wildlife Management Area
Matagorda, Texas	Big Boggy National Wildlife Refuge
	Matagorda Bay Nature Park
	San Bernard National Wildlife Refuge
	West Moring Dock Park
Brazoria, Texas	Brazoria National Wildlife Refuge
	Christmas Bay Coastal Preserve
	Justin Hurst Wildlife Management Area
	San Bernard National Wildlife Refuge
Galveston, Texas	Anahuac National Wildlife Refuge
	Bolivar Flats Shorebird Sanctuary
	Fort Travis Seashore Park
	Galveston Island State Park
	Horseshoe Marsh Bird Sanctuary
	Mundy Marsh Bird Sanctuary
	R.A. Apffel Park
	Seawolf Park
Jefferson, Texas	McFaddin National Wildlife Refuge
	Sea Rim State Park
	Texas Point National Wildlife Refuge
Cameron, Louisiana	Peveto Woods Sanctuary
	Rockefeller State Wildlife Refuge and Game Preserve
	Sabine National Wildlife Refuge
Vermilion, Louisiana	Paul J. Rainey Wildlife Refuge and Game Preserve
	Rockefeller State Wildlife Refuge and Game Preserve
	State Wildlife Refuge
Iberia, Louisiana	Marsh Island Wildlife Refuge
	Shell Key National 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)
Plaquemines, Louisiana	Breton National Wildlife Refuge
	Delta National Wildlife Refuge
	Pass a Loutre Wildlife Management Area

The level of impacts from oil 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 of a spill (BOEM, 2017a,b).

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, pre-existing stress levels, soil types, and water levels may influence the impacts of oil exposure on wetlands. Impacts to slightly oiled vegetation are considered short-term and reversible as recent studies suggest that they will experience plant die-back, followed by recovery without replanting (BOEM, 2012a). Vegetation exposed to oil that persists in wetlands could take years to recover (BOEM, 2017a). Vegetation coated with oil experiences the highest mortality rates due to decreased photosynthesis (BOEM, 2012a). A recent review of the literature and new studies indicated that oil spill impacts to seagrass beds are often limited and may be limited to when oil is in direct contact with these plants (Fonseca et al., 2017). Entrained oil within the sediments of a submerged vegetation area may pose the risk of periodic re-releases of oil in the area, causing potential secondary impacts to the localized area (BOEM, 2023b). 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 oil spill are expected to be significant.

C.8 Socioeconomic and other Resources

C.8.1 Recreational and Commercial Fishing

Potential impacts to recreational and commercial fishing were assessed by BOEM (2017a). The main commercial fishing activity in deep waters of the northern Gulf of America is pelagic longlining for tunas, swordfishes, and other billfishes (Continental Shelf Associates, 2002; Beerkircher et al., 2009). Pelagic longlining has occurred historically in the project area, primarily during the spring and summer seasons. In August 2000, the federal government closed two areas in the northeastern Gulf of America to longline fishing (65 FR 47214). The project area 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 33 to 98 ft (10 to 30 m) long, and their fishing trips last from approximately 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 820 to 1,804 ft (250 to 550 m) (Stiles et al., 2007). Tilefishes (primarily *Lopholatilus chamaeleonticeps*) are caught by bottom longlining in water depths from about 540 to 1,476 ft (165 to 450 m) (Continental Shelf Associates, 2002).

Most recreational fishing activity in the region occurs in water depths less than 656 ft (200 m) (Continental Shelf Associates, 1997, 2002; Keithly and Roberts, 2017). In deeper water, the main attraction to recreational fishers is 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 IPF associated with routine operations that potentially may affect fishing is drilling rig presence (including underwater sound and lights). Two types of potential accidents are also addressed below (a small fuel spill and a large oil spill). These IPFs with potential impacts listed in **Table 2** are discussed below.

Impacts of Drilling Rig Presence, Underwater Sound, and Lights

There is a slight possibility of pelagic longlines becoming entangled in the drilling rig. 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 America (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.

Because it is unlikely that any recreational fishing activity is occurring in the project area, no adverse impacts are anticipated. Other project-related factors such as underwater sound and lights are not relevant IPFs to commercial or recreational fishing.

Impacts of a Small Fuel Spill

The probability of a fuel spill is expected to be minimized by Anadarko's preventative measures during routine operations, including fuel transfer. In the unlikely event of a spill, implementation of Anadarko's OSRP is expected to potentially mitigate and reduce the potential for impacts. EP Section H provides details on spill response measures. Given the open ocean location of the project area, the duration of a small spill would be brief and opportunity for impacts to fishing activities would be minimal.

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 dissipating (see **Section A.9.1**).

Impacts of a Large Oil Spill

Potential spill impacts on fishing activities are discussed by BOEM (2017a, 2023a,b). For this EP, 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 America 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 of the spill, and the effectiveness of spill response measures. The *Deepwater Horizon* incident provides information about the maximum potential extent of fishery closures in the event of a large oil spill in the Gulf of America. At its peak on 12 July 2010, closures encompassed 84,101 mi^2 (217,821 km^2), or 34.8% of the U.S. Gulf of America Economic Exclusion Zone.

According to BOEM (2012a, 2017a), the potential impacts on commercial and recreational fishing activities from an accidental oil spill are anticipated to be minimal because the potential for oil spills is very low, the most typical events are small and of short duration, and the effects are so localized that fishes are typically able to avoid the affected area.

Fish populations may be affected by an oil spill event should it occur, but they would be primarily affected if the oil 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 also low. Should a large oil 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. 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. The project area is approximately 119 mi (192 km) from the nearest shoreline, and nearly all of the diesel fuel would evaporate or disperse naturally within 24 hours (see **Section A.9.1**). Impacts of a large oil spill are addressed below.

Impacts of a Large Oil Spill

In the event of a large oil spill resulting from a blowout, 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, crude oil weathers rapidly (National Research Council, 2003a). Depending on many factors such as spill rate and duration, the physical/chemical characteristics of the oil, meteorological, and oceanographic conditions at the time, and the effectiveness of spill response measures, weathered oil may remain present on the sea surface and reach coastal shorelines.

Based on data collected during the *Deepwater Horizon* incident, the health risks resulting from a large oil spill appear to be minimal (Centers for Disease Control and Prevention, 2010). Health risks for spill responders and wildlife rehabilitation workers responding to a major oil spill are similar to the health risks incurred by response personnel during any large-scale emergency or disaster response (U.S. Department of Homeland Security, 2014), which includes the following:

- Possible accidents associated with response equipment;
- Hand, shoulder, or back pain, along with scrapes and cuts;
- Itchy or red skin or rashes due to potential chemical exposure;
- Heat or cold stress depending upon the working environment; and
- Possible upper respiratory symptoms due to potential dust inhalation, allergies, or potential chemical exposure.

Krishnamurthy et al. (2019) identified that exposure to both crude oil and oil dispersant among USCG spill responders during the *Deepwater Horizon* incident was more strongly associated with the battery of acute neurological symptoms that were evaluated than was exposure to oil alone. Those acute neurological symptoms observed in 1% to 3% of the responders surveyed included headaches, lightheadedness/dizziness, difficulty concentrating, numbness/tingling sensation, blurred/double vision, and memory loss/confusion. Krishnamurthy et al. (2019) did conduct sensitivity analyses to exclude responders in the highest environmental heat categories and responders with relevant pre-existing conditions due to the symptoms being similar to heat stress.

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 drilling activities 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. 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 oil spill are addressed below.

Impacts of a Large Oil Spill

Potential socioeconomic impacts of an oil spill are discussed by BOEM (2017a). For the EIA, 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 extensive fishery closures that 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); it could result in adverse publicity that affects employment in coastal recreation and tourism industries; and it could result in suspension of OCS drilling activities, including service and support operations that are an important part of local economies.

Non-market effects such as traffic congestion, strains on public services, shortages of commodities or services, and disruptions to the normal patterns of activities or expectations could also occur in the short-term. These negative, short-term social and economic consequences of a spill are expected to be modest in terms of projected cleanup expenditures and the number of people employed in cleanup and remediation activities (BOEM, 2017a). Net employment impacts from a spill would not be expected to exceed 1% of baseline employment in any given year (BOEM, 2017a).

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 intended to minimize the chance of trash or debris being lost overboard from the drilling rig 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 Oil Spill

Potential impacts of an oil spill on recreation and tourism are discussed by BOEM (2017a, 2023b). For this EP, 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.

Based on the 30-day OSRA modeling (**Table 3**), Cameron Parish in Louisiana is the coastal area most likely to be affected (4% probability within 30 days). Within 30 days, shoreline segments of six Louisiana parishes and five Texas counties have a probability of 1% to 4% of being contacted. Based on the 60-day OSRA modeling estimates (**Table 4**), the potential for shoreline contact ranges from Cameron County, Texas to Miami-Dade County, Florida (up to 13% conditional probability within 60 days). According to BOEM (2017a), should an oil 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. In the unlikely event that a spill occurs that is sufficiently large to affect large areas of the coast and, through public perception, have effects that reach beyond the damaged area, effects to recreation and tourism could be significant (BOEM, 2012a).

C.8.5 Land Use

Land use along the northern Gulf coast is discussed by BOEM (2017a, 2023b). There are no routine IPFs that potentially may affect land use. The project will use existing onshore support facilities in Louisiana where the land use 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 oil spill is the only relevant IPF. A small fuel spill should not have any impacts on land use, as the response would be staged out of existing shorebases and facilities.

Impacts of a Large Oil Spill

The initial response for a large oil spill would be staged out of existing facilities, with no expected effects on land use. A large spill could have limited temporary impacts on land use along the coast if additional staging areas were needed. For example, during the *Deepwater Horizon* incident, temporary staging areas were established in Louisiana, Mississippi, Alabama, and Florida for spill response and cleanup efforts. In the event of a large spill in the project area, similar temporary staging areas could be needed. These areas would eventually return to their original use as the response is demobilized.

It is not expected that a large oil spill and subsequent cleanup would substantially reduce available space in nearby landfills or decrease their usable life (BOEM, 2014). An accidental oil 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.

BOEM (2016b) states that landfill capacity would probably not be an issue at any phase of an oil spill event or the long-term recovery. In the case of the *Deepwater Horizon* incident and response, the USEPA reported that existing landfills receiving oil spill waste had plenty of capacity to handle waste volumes; the wastes that were disposed of in landfills represented less than 7% of the total daily waste normally accepted at these landfills (USEPA, 2016).

C.8.6 Other Marine Uses

The project area is not located within any USCG-designated fairway or shipping lane. However, it is located in Military Warning Area W-92. Anadarko will comply with BOEM requirements and lease stipulations to avoid impacts on uses of the area by military vessels and aircraft. The site clearance letters for the proposed wellsites reported no existing flowlines, or wells within 2,000 ft (610 m) (Ocean Geo Solutions, 2024; Xodus, 2026a,b,c,d,e,f).

There are no IPFs from routine project activities that are likely to affect other marine uses of the project area. A large oil spill is the only relevant 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 Oil Spill

A large accidental spill would be unlikely to significantly affect shipping or other marine uses. In the event of a large spill requiring numerous response vessels, coordination would be required to manage the vessel traffic for safe operations. Anadarko will 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[1]

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 Anadarko's EP are within the range of activities described and evaluated by BOEM in the 2024 to 2029 Programmatic Environmental Impact Statement for the OCS Oil and Gas Leasing Program (BOEM, 2023a). Past, present, and reasonably foreseeable activities were identified in 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, 2023a,b, 2025).

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. Anadarko 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, 2023a,b, 2025).

[1] On May 20, 2022, the National Environmental Policy Act (NEPA) original requirements came into effect and were reinstated by the Council on Environmental Quality (CEQ), which is responsible for Federal agency implementation of NEPA.

Impacts of Planned Actions. The BOEM (2017a) Final EIS included a discussion of cumulative impacts, which analyzed the incremental environmental and socioeconomic impacts 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 EIS considered exploration, delineation, and development wells; platform installation; service vessel trips; and oil spills. The EISs examined the potential additive effects on each specific resource for the entire Gulf of America.

The level and type of activity proposed in Anadarko's EP 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 EP, in conjunction with the other reasonably foreseeable activities expected to occur in the Gulf of America. For all impacts, the incremental contribution of Anadarko's proposed actions to the cumulative impacts analysis in these prior analyses are not expected to be significant.

D. Environmental Hazards

D.1 Geologic Hazards

The site clearance letters provided by Anadarko concluded that the locations of the proposed activities are generally favorable for the proposed activities (Ocean Geo Solutions, 2024; Xodus, 2026a,b,c,d,e,f). See EP Section C 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 drilling rig under consideration 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. In the event of a hurricane, procedures as outlined in the Hurricane Evacuation Plan would be adhered to.

From 2011 to 2024, 22 tropical storms and/or hurricanes have shut down oil and gas activities in the Gulf of America (BSEE, 2024). Damage was minimal from the storms in 2017 to 2023 and only Hurricane Ida in 2021 caused an accidental release from a ruptured pipeline and well head off the Louisiana coastline (BSSE, 2024). Evacuation in the event of a hurricane or other severe weather would increase the number and frequency of support vessel and helicopter trips to and from the project area.

D.3 Currents and Waves

Meteorology and (physical) oceanography 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 drilling rig under consideration for this project. High waves during a severe storm could disrupt support activities (i.e., vessel and helicopter traffic), and risks to the project brought on by such conditions would be closely monitored and managed. In some cases, it may be necessary to suspend some activities 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 a potential drilling rig, were considered by Anadarko.

F. Mitigation Measures

The proposed action includes numerous mitigation measures required by laws, regulations, and BSEE and BOEM lease stipulations and NTLs. The project will comply with all applicable federal, state, and local requirements concerning air pollutant emissions, discharges to water, and solid waste disposal. All project activities will be conducted under guidance by Anadarko's OSRP and Safety and Environmental Management System. Additional information can be found in EP Section I.

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 Tiggelaar (Project Scientist and Project Manager);
- Ashley Lawson (Project Scientist);
- Kayla Hartigan (Project Scientist); and
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Xodus. 2026c. Well Clearance Letter for Anadarko Petroleum Corporation. Project: Bandit Prospect, Green Canyon Block 679, Gulf of America. Proposed GC679-Y Well Location. Xodus Assignment Number: H100255-S00-105.

Xodus. 2026d. Well Clearance Letter for Anadarko Petroleum Corporation. Project: Bandit Prospect, Green Canyon Block 679, Gulf of America. Proposed GC679-Z Well Location. Xodus Assignment Number: H100255-S00-105.

Xodus. 2026e. Well Clearance Letter for Anadarko Petroleum Corporation. Project: Bandit Prospect, Green Canyon Block 680, Gulf of America. Proposed GC680-U Well Location. Xodus Assignment Number: H100255-S00-105.

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SECTION O
ADMINISTRATIVE INFORMATION

(a) Proprietary Information

Proprietary copies of this plan contain information not available to the public and include structure maps, seismic information, cross sections, depths of wells, etc.

(b) Bibliography

- Initial Exploration Plan Control No. N-10245
- Shallow Hazards Reports denoted in **Section C**
- Archaelogical Assessment denoted in **Section E**
- Final Notice of Sale Package for Gulf of Mexico Sale Number 175, and 178 Part 1