BOEM 2026-020

DCOR, LLC Well Stimulation Treatment Environmental Impact Statement

Platform Gilda
Offshore Ventura County

April 2026

BUREAU OF OCEAN ENERGY MANAGEMENT • U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF SAFETY AND ENVIRONMENTAL ENFORCEMENT • U.S. DEPARTMENT OF THE INTERIOR

Certification of Environmental Impact Statement (or Assessment) Compliance

This letter certifies that the DCOR, LLC Well Stimulation Treatment Environmental Impact Statement (WST EIS) complies with the requirements outlined in Section 1.5 of the DOI Handbook of National Environmental Policy Act Implementing Procedures (516 DM 1).

Page Limit Certification

The WST EIS, not including citations and appendices, does not exceed the 150 page limit. This document has been prepared in accordance with the specified formatting criteria outlined in Section 1.5(e) of 516 DM 1. As the responsible official, I certify that the breadth and depth of the analysis have been tailored to meet this page limit. This EIS represents BOEM's good-faith effort to prioritize the most important considerations required by NEPA and other applicable statues within the mandated page limits. Our prioritization reflects the bureau's expert judgment, and any considerations addressed briefly or left unaddressed were, in our judgment, not of a substantive nature that would have meaningfully informed the environmental effects or the resulting decision.

Deadline Certification

This EIS has been completed within the required statutory deadline described in Section 1.5(f) of 516 DM 1. The completion date of this document is within two years of March 18, 2026, which is when the NOI was published. I certify that this document represents the bureau's good-faith effort to fulfill NEPA's requirements within the congressional timeline. In our expert opinion, the analysis is thorough and adequate to inform and reasonably explain the bureau's decision regarding the proposed action.

DOUGLAS BOREN Digitally signed by DOUGLAS BOREN
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13 April 2026
Date

Douglas P. Boren
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FREQUENTLY USED ABBREVIATIONS AND ACRONYMS

μg/m^3	micrograms per cubic meter
μPa	micropascal
bbl	barrel
BOEM	Bureau of Ocean Energy Management
bpm	barrels per minute
BSEE	Bureau of Safety and Environmental Enforcement
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CalEEMod	California Emissions Estimator Model
CARB	California Air Resources Control Board
CFR	Code of Federal Regulation
CH_4	methane
CHC	Commercial Harbor Craft
CMP	Coastal Management Program
CO	carbon monoxide
CO_2	carbon dioxide
CO_2E	carbon dioxide equivalents
CWA	Clean Water Act
DFIT	Diagnostic Fracture Injection Test
DPM	diesel particulate matter
DPP	Development and Production Plan
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FMP	Fishery Management Plan
FWS	U.S. Fish and Wildlife Service
GHG	greenhouse gas
H_2S	hydrogen sulfide
HAPC	Habitat Area of Particular Concern
JOFLO	Joint Oil Fisheries Liaison Office
mg/L	milligrams per liter
MMPA	Marine Mammal Protection Act
$MTCO_2E$	metric tons of carbon dioxide equivalent
MMS	Minerals Management Service
N_2O	nitrous oxide

NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
nm	nautical miles
NMFS	National Marine Fisheries Service
NO	nitric oxide
NO_2	nitrogen dioxide
NO_3	nitrate
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NSR	New Source Review
O_3	ozone
OCS	Outer Continental Shelf
OSRO	On-site Spill Response Organization
OSRP	Oil Spill Response Plan
OCS	Outer Continental Shelf
PFMC	Pacific Fishery Management Council
PM	particulate matter
PM_{10}	particulate matter with a diameter of 10 microns or less
$PM_{2.5}$	particulate matter with a diameter of 2.5 microns or less
PTO	Permit to Operate
SCB	Southern California Bight
SCCAB	South Central Coast Air Basin
SO_2	sulfur dioxide
TAC	toxic air contaminant
TSS	Traffic Separation Scheme
TVD	Total Vertical Depth
USCG	U.S. Coast Guard
USGS	U.S. Geological Survey
VCAPCD	Ventura County Air Pollution Control District
VOC	volatile organic compound
WCD	worst-case discharge
WET	whole-effluent toxicity
WST	well stimulation treatment

1.0 INTRODUCTION

This Environmental Impact Statement (EIS) evaluates a proposal to implement hydraulic fracturing Well Stimulation Treatments (WST) at platform Gilda, as described in the Development and Production Plan (DPP) Supplement entitled, “Update to Development and Production Plan and Environmental Report Well Stimulation: Hydraulic Fracturing (January 2026)” received by BOEM on January 20, 2026 by operator DCOR, LLC (DCOR).

Operators conducted a series of well stimulation treatments, specifically hydraulic fracturing, in the Santa Clara Unit, which includes Platform Gilda, between 1986 and 2014 (see **Section 2.2**). In a 2014–15 lawsuit, several plaintiffs sued Bureau of Ocean Energy Management (BOEM) and Bureau of Safety and Environmental Enforcement (BSEE) over unpermitted fracking, challenging 51 offshore WST permits in the Pacific Outer Continental Shelf (OCS). As part of a January, 2016 lawsuit settlement, BOEM agreed to complete a programmatic environmental analysis (PEA) on fracking and well stimulation to address the impacts of WST. Plaintiffs challenged the PEA and Finding of No Significant Impact (FONSI); a 2019 decision from the Central District of California Court mostly ruled for BOEM. The plaintiffs challenged this ruling and a Ninth Circuit Court of Appeals ruling dated June 3, 2022 reversed the lower court, holding the agencies violated the National Environmental Policy Act (NEPA), Endangered Species Act (ESA), and Coastal Zone Management Act (CZMA). The Court held that the PEA failed to fully analyze the environmental risks of "unknown" impacts from offshore fracking. The court also held that BOEM failed to submit a consistency determination to the California Coastal Commission to ensure compliance with the state coastal zone management plan and that BOEM failed to properly consult with the Fish and Wildlife Service regarding risks to threatened and endangered species. The Ninth Circuit Court issued a permanent injunction stopping new fracking permits in the Pacific Outer Continental Shelf until an EIS is complete. In June 2023, the U.S. Supreme Court denied certiorari.

In January 2026, BOEM received an Update to the Platform Gilda DPP to incorporate WST for 16 wells on Platform Gilda from DCOR. In February 2026, BOEM deemed DCOR’s Supplemental DPP and accompanying information submitted and began review of the materials for approval, approval with conditions, or denial.

On January 20, 2025, President Donald J. Trump declared a national energy emergency and directed the heads of executive departments and agencies, including the Secretary of the Interior, to “identify and exercise any lawful emergency authorities available to them, as well as all other lawful authorities they may possess, to facilitate the identification, leasing, siting, production, transportation, refining, and generation of domestic energy resources, including, but not limited to, on Federal lands” (Sec. 2(a), Executive Order (E.O.) 14156, “Declaring a National Energy Emergency”).

This EIS was prepared on a 28-day timeline in accordance with the guidance, “Alternative Arrangements For NEPA Compliance During a National Energy Emergency,” dated April 23, 2025, that was developed by the Department of the Interior (DOI) in response to E.O. 14156.

The request from DCOR for consideration of the alternative NEPA arrangements, and the BOEM's response approving the request, is available on the BOEM project website (BOEM 2026).

1.1 PURPOSE AND NEED

The Outer Continental Shelf Lands Act (OCSLA), as amended, and the Federal Oil and Gas Royalty Management Act (1982) direct the Secretary of DOI, delegated to the BOEM and BSEE, to establish policies and procedures that expedite exploration and development of the OCS oil and gas production in a manner that protects and conserves the environment. Under OCSLA, BSEE and BOEM must administer offshore leases in a manner that balances the national interest in conserving natural resources (e.g., mineral resources), preventing waste, and protecting correlative rights (43 United States Code [U.S.C.] 1334(a)) with effective management of the marine, coastal, and human environments (43 U.S.C. 1332(4)).

The purpose of the Proposed Action is to consider DCOR, LLC's (DCOR) update to the Platform Gilda DPP to include WST of 16 wells on Platform Gilda (OCS P-0216). The need for BOEM to consider the action is to increase and extend production of OCS oil and gas materials as feedstocks for domestic use in a variety of industries and for end-use petroleum products (e.g., refined gasoline and other fuels), as established by BOEM's mandate under OCSLA (43 U.S.C. 1331 et seq.) to further the orderly development of OCS oil and gas resources, subject to environmental safeguards.

1.2 BACKGROUND

Platform Gilda (lease OCS P-0216) is located on the OCS, approximately nine miles southwest of Ventura, California in the Santa Barbara Channel in approximately 205 feet (ft) of water. It lies within the Santa Clara Unit of federal OCS leases (**Figure 1.2 1**). The Platform was installed in 1981 by Union Oil Company of California, with initial drilling commencing that same year and production beginning in 1982; it has operated continuously since its installation. The original DPP and Environmental Report were prepared by Union Oil Company of California in November 1979 and approved by the U.S. Geological Survey (USGS) in December 1980.

Initial construction at Platform Gilda included 96 conductor slots. Since then, 70 wells, plus additional sidetracks and redrills, have been drilled from the Platform, with the most recent well drilled in 2014. DCOR has operated the Platform and its associated leases (P-0215 and P-0216) since 2005. Platform Gilda is currently the only producing facility in the Santa Clara Unit. Platform Grace, located on the adjacent and now-relinquished Lease Block P-0217, is undergoing decommissioning. An update to the DPP was submitted in October 1985 and approved in July 1986. A list of past DPPs and Environmental Reports are detailed in **Table 1.2-1**.

Table 1.2-1. Previous DPPs and Environmental Reports for Platform Gilda

Document Title	Date Prepared	Date Approved
Santa Clara Unit OCS P-0216 – Amended Plan of Development (original DPP)	November 1979	December 18, 1980

Document Title	Date Prepared	Date Approved
Santa Clara Unit OCS P-0216 – DPP Environmental Report	November 1979	December 18, 1980
Santa Clara Unit OCS P-0216 – Update to Plan of Development	October 1985	July 29, 1986
Santa Clara Unit OCS P-0216 – Revised DPP NMFS Consultations Terms & Conditions	November 2024	December 18, 2024

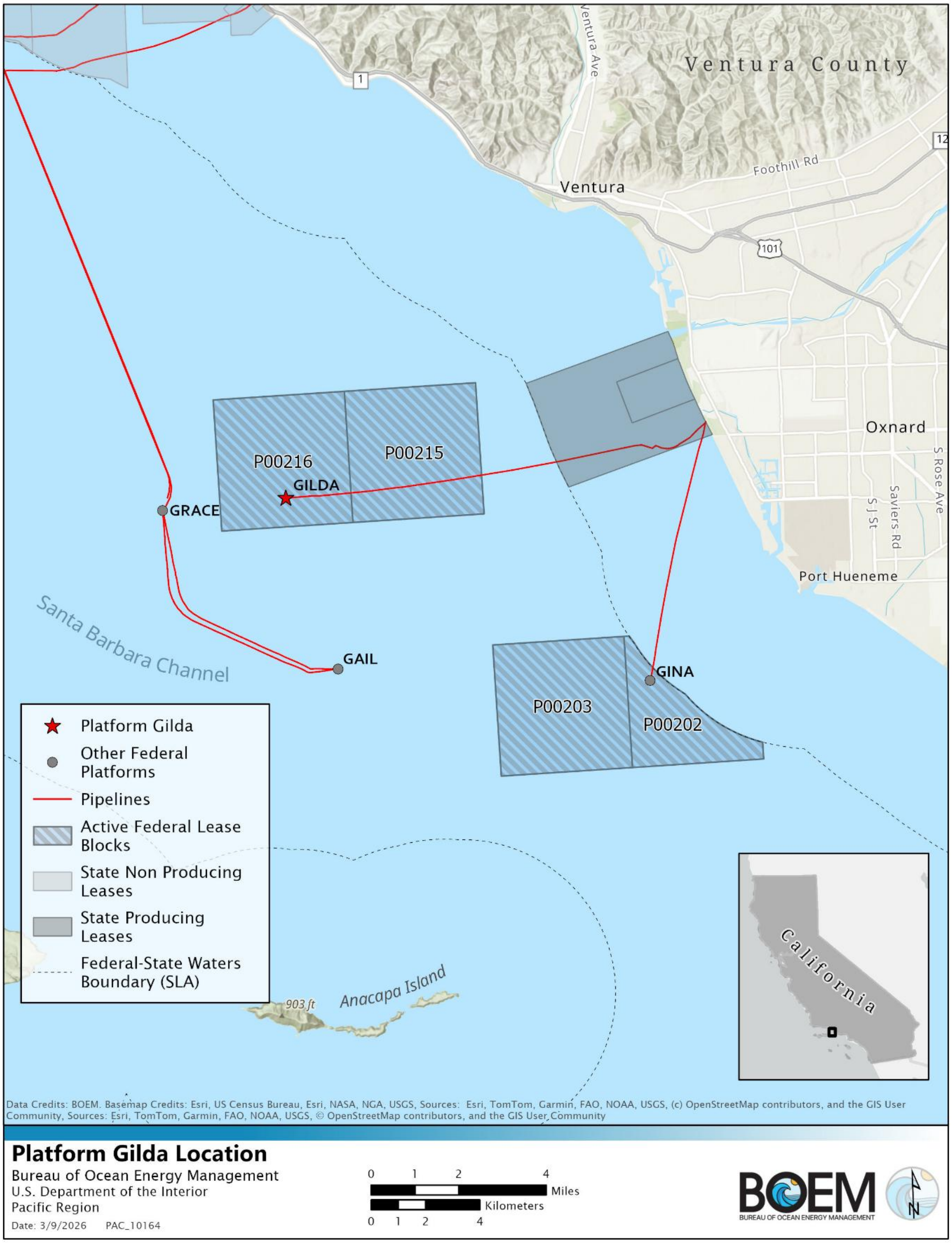

Figure 1.2-1. Platform Gilda Location

These earlier documents supported the development and production of multiple geologic formations, including the Pico, Repetto, and Monterey Formations.

Previously approved DPPs for the Platform were prepared by DCOR's predecessor Union Oil Company of California (also known as Unocal Corporation). The 1979 DPP provided the requirements to develop the Repetto and Monterey formations on Lease OCS P-0216. Key components of the 1979 DPP included the installation of Platform Gilda, initial drilling design, reservoir evaluations and production systems, and a description of the pipelines and onshore facilities. In 1985, Unocal updated the DPP for Platform Gilda to expand the focus of reservoir development to the Lower Repetto and Monterey Formation and planned to fully use all 96 well conductor slots on the Platform (Unocal 1985).

DCOR's updated DPP builds on these existing approved documents and incorporates new well stimulation activities, specifically hydraulic fracturing of 16 existing wells, designed to increase reservoir permeability in order to optimize hydrocarbon recovery.

2.0 PROPOSED ACTION: WELL STIMULATION PROGRAM WITH HYDRAULIC FRACTURING (ALTERNATIVE 1)

Under Alternative 1, DCOR would implement well stimulation within 16 wells: four well stimulation target locations in the Upper Repetto and 12 well stimulation target locations in the Lower Repetto. Well stimulation would be achieved with hydraulic fracturing methods. Hydraulic fracturing is performed with injection pressures that exceed the formation fracture pressure and create fractures in the formation, which increase the conductivity of the oil and gas from the reservoir through existing wellbores and production facilities. Each treatment will be preceded by a Diagnostic Fracture Injection Test (DFIT) to collect formation-specific pressure data, fracture gradient, fluid efficiency, and to determine the most optimal treatment design required to safely and efficiently perform each well stimulation. Fracturing depths would be greater than 4,500 ft below the seafloor surface.

The Proposed Action would not include any open ocean disposal of WST fluids. All flowback fluid generated during stimulation activities will be routed through a closed-loop handling system and retained on the Platform. Returned stimulation fluids will be reinjected into existing injection wells on the Platform, and no offshore discharge of stimulation flowback fluids will occur. Solid waste, such as residual sand or other materials, will be separated and contained for transport to a licensed onshore disposal facility. All discharged waste will be disposed of in accordance with the currently approved National Pollutant Discharge Elimination System (NPDES) permit.

The WST Program proposed by DCOR (referred to as “Program” throughout the document) is planned over a five-year period, with up to six wells stimulated during one campaign in a single year. Active well stimulation activities would be performed for 14 days per year and would use existing crew and support vessels. The stimulation activities would occur in stages (described in detail in **Section 2.4**): each stage will be performed over one day at the Platform, followed by a three-day period before the next stage. The well stimulation equipment would be temporarily mobilized to Platform Gilda and would operate with Tier 4 engines. The current fleet of Platform crew and support vessels would be used for equipment and crew transport. No additional vessels, including frack vessels, would be used for this Program. These measures would minimize emissions to help ensure that the Platform emissions will not exceed permitted thresholds and the Program will operate under the existing Air Pollution Control Division Permit to Operate (PTO).

2.1 ENVIRONMENTAL SETTING

The Santa Clara Field is located within the offshore portion of the Santa Barbara-Ventura Basin, a structural and sedimentary basin known for prolific oil and gas production (Galloway 1998). The basin is characterized by a series of east-west trending folding and faulting resulting from compressional tectonics. Structurally the field occupies the crest and northern flank of an anticlinal trend referred to as the Santa Clara Anticline (Brickey and Galloway 1998). This anticline is related to a north-dipping reverse fault system which is bounded on south by a fault generally referred to as the World’s End Fault System (Unocal 1985; Padre Associates

Inc. 2026), although the World's End Fault System is also known by several other names in various literature (Brickey and Galloway 1998). Several small, northwest-southeast trending faults and structural saddles further subdivide the field (MMS 1991).

Platform Gilda is located within the Santa Barbara Channel which sits in an ecological transition zone with cooler, more nutrient-rich waters to its northwest and warmer, more tropical waters to its southeast. This transition zone has resulted in the development of distinctive communities and foraging grounds for its resident and migrating wildlife. See **Section 4.1** for a detailed discussion of the Affected Environment. The Affected Environment section also describes the environment under the No Action alternative.

2.1.1 Stratigraphy and Reservoir Characteristics

The Santa Clara Field produces from several formations, each of which exhibits different lithologic and production characteristics. The proposed activity will not directly disturb the seafloor. No new seafloor penetrations, anchoring, pipeline laying, or conductor setting is proposed as part of this action; therefore, the shallow hazard assessment is focused on the subsurface geology. Also relevant is the shallow hazard assessment conducted as part of the original DPP, which concluded that no shallow hazard existed within the Affected Environment (Unocal 1979).

Pico Formation. The Pico Formation is Pliocene in age and is composed of gas-bearing sands deposited in submarine fan systems. Though present across the field, the Pico Formation has not been a primary focus of stimulation activity to date and is not the focus of the proposed Program.

Repetto Formation. The Repetto Formation, which is subdivided into Upper and Lower intervals, underlies the Pico Formation and is also Pliocene in age. Multiple confining shale layers exist between the Repetto Formation's target zones and the seafloor, proven by these zones as oil bearing, while similar quality zones above the confining layers contain no hydrocarbons. The Repetto Formation is composed of sand-rich submarine fan deposits that prograde westward into the basin from the north and east. Together with the Pico Formation, the Repetto Formation can range between 5,000 and 10,000 ft thick. The Repetto Formation is the primary target of the proposed stimulation program due to its extensive oil-bearing intervals and moderate to low permeability.

Within the Upper Repetto Formation, eight subzones have been identified (progressing deeper): LP-B, LP-B1, LP-B2, LP-C, LP-C1, LP-C2, LP-C4, and LP-C5. These subzones consist of sand-rich channels and fan-lobe deposits interbedded with mudstones. In the northern part of the field, deeper sandstone subzones thin to zero thickness forming a wedge shape feature referred to as a pinch-out. These wedge shaped sedimentary features create a type of geologic feature that restricts the flow of fluid known as a stratigraphic trap. Shallower subzones thin out progressively farther south due to southward migration of submarine fan deposition. Where these features are absent, the World's End Fault system serves as the primary structural trap for hydrocarbons. This fault intersects the Upper Repetto and acts as a semi-impermeable seal to fluid migration from the eight subzones. The World's End Fault does not have a seafloor expression and previous geophysical interpretations do not provide evidence of extending the fault from depth to the seafloor or to shallow horizons. The average overburden-corrected core porosity is 24.3 percent, and permeability averages 88 millidarcies (md), with the best reservoir quality found in subzones LP-B and LP-C4.

The Lower Repetto Formation contains five subzones (progressing deeper): LP-K, LP-K1, LP-L, LP-M, and LP-N. These subzones are composed of medium- to thinly-bedded sandstones and mudstones deposited in westward-prograding submarine fans. The deepest subzone, LP-N, consists of thicker, more amalgamated sands compared to the overlying subzones. The average overburden-corrected core porosity is 18.4 percent, and permeability averages 11.5 md. The Lower Repetto oil system that is targeted for stimulation is composed solely of stratigraphic traps (i.e., pinch outs) and does not rely on faulting as a sealing mechanism to limit fluid migration.

A confining shale layer ranging 15 to 25 ft thick occurs above the Lower Repetto interval and has been identified in multiple wells across the field. This layer is located approximately 250 ft above the shallowest zone proposed for well stimulation. Also present are overlying shale layers that provide seals to prevent vertical migration of fluids.

Monterey Formation. Underlying the Repetto Formation is the Monterey Formation, a Miocene-age unit that is approximately 1,500 ft thick where it occurs in the Santa Clara Field. It is composed of deep-marine cherts, carbonates, and organic-rich siliceous shales. The Monterey Formation is naturally fractured due to silica diagenesis and tectonic compression and has been developed intermittently in the field with variable production performance. The Monterey formation is not the focus of the proposed stimulation Program.

Sespe Formation. The Sespe is an Oligocene-age unit and is the deepest formation penetrated in the field. It underlies the productive sequence but has not been developed for hydrocarbon production in the current lease area. The Sespe Formation is not the focus of the proposed stimulation Program.

2.2 WELL STIMULATION TREATMENT (WST) HISTORY

To enhance recovery from low-permeability zones, Platform Gilda Operators conducted a series of well stimulation treatments, specifically hydraulic fracturing, between 1986 and 2014 (**Table** 2.2-1). These treatments primarily targeted the Upper and Lower Repetto intervals. Stimulation treatments during this period included 28 hydraulic fracturing treatments in 14 wells (Argonne National Laboratory 2016). Of the hydraulic fracturing treatments, 12 were performed in the Upper Repetto and 15 in the Lower Repetto between 1994 and 2014. The largest treatment, conducted in 2014 on well S-33 RD2, involved the injection of approximately 102,000 gallons of fracturing fluid combined in two stages. Typical onshore hydraulic fracturing operations have used between 1.75 and 10 million gallons per well per year (Houseworth and Stringfellow 2015).

No induced seismic events were reported during or following any of the offshore stimulation treatments. The proposed stimulation intervals remain located at considerable distances from mapped Quaternary faults. In addition, no well-integrity induced events were reported during or following any of the previous stimulation treatments. The proposed stimulations would adhere to the current required well testing and assessment standards described in **Section 2.8**.

Table 2.2-1. Historical Hydraulic Fracturing Treatments on Platform Gilda

Year	Well ID	No. of Treatments	Target Formation/Field
1986	S-59	1	Monterey
1994	S-60	2	Upper Repetto
1996	S-89	2	Upper Repetto
1996	S-62	2	Lower Repetto
1996	S-89	2	Upper Repetto
1997	S-87	2	Upper Repetto
1997	S-62	2	Lower Repetto
1998	S-28	2	Lower Repetto
1998	S-61	2	Lower Repetto
2001	S-65	2	Lower Repetto
2001	S-44	3	Lower Repetto
2001	S-62	2	Lower Repetto
2014	S-75	2	Upper Repetto
2014	S-33	2	Upper Repetto

2.3 OIL SPILL CONTINGENCIES AND WORST-CASE DISCHARGE

Oil spills are not authorized by the Proposed Action nor intended to occur but must be planned for by operators and lessees and they must have the capability to respond to spills if they occur. The total volume of oil spilled in the Pacific Region is dominated by the 1969 Santa Barbara spill (80,900 barrels [bbl]), which occurred soon after production began. During 1970– 2022, there were 1,449 oil spills with an average volume of 1 bbl/spill and a total volume of 1,508 bbl. BOEM estimates one spill with a 63 percent probability of occurrence is possible within the “50 to 1,000 bbl” size range. An oil spill greater than 1,000 bbl in size is very unlikely and could not be calculated because the majority of reservoirs have low to no pressure now due to the maturity of the oil fields. Oil production has steadily declined over the decades, so there is now less oil to be produced and therefore less oil that could be accidentally spilled. However, other factors such as human error or equipment failure can play a role in risk of an oil spill and small spills (50 bbl or less) are possible for as long as oil is being produced. Taking into account these factors, the overall risk of an oil spill occurring has declined over time in the Southern California Planning Area.

There is no indication that age of infrastructure on the Pacific OCS contributed to recent oil spills in the region. Regarding the 2021 Huntington Beach oil spill in particular, the investigation into the cause of the spill by the National Transportation Safety Board determined that the spill resulted not due to age of infrastructure but from contact of cargo ship anchors with the underwater pipeline. Systems in place that provide protective measures against oil spills and aging infrastructure are discussed in **Section 2.10**.

BSEE regulations at 30 CFR 254 require that each OCS facility must have a comprehensive Oil Spill Response Plan (OSRP or response plan). Response plans consist of an emergency response action plan, including an equipment inventory, oil spill response cooperatives, WCD scenario, dispersant and burning plans, and details on training and drills. BSEE inspectors are on duty every day of the year to ensure compliance with BOEM and BSEE requirements. BSEE must ensure that offshore operators have OSRPs and that they are prepared and knowledgeable to implement these plans should an oil spill occur. BSEE periodically directs operators to deploy oil spill response equipment as listed in their response plans through unannounced exercises which BSEE has the regulatory authority to oversee. For any given exercise, equipment deployed may include oil spill boom, mechanical skimmers, response vessels, oil storage equipment, aircraft, and marker buoys. These equipment verification inspections and unannounced exercises work to ensure that all offshore operators in the Pacific Outer Continental Shelf Region (POCSR) have the requisite knowledge to immediately and effectively deploy on-site resources in the event of any accidental release from the platform.

The U.S. Coast Guard (USCG) is the lead response agency for oil spills in the coastal zone. Oil spill drills, either agency-lead or self-lead by a company, also use the UC/Incident Control System. California's Office of Spill Prevention and Response assume the role of the state on-scene coordinator and plays a significant role in managing wildlife operations in the Southern California Planning Area as the state's Natural Resource Agency.

DCOR's contracted Oil Spill Response Organization (OSRO) is Marine Spill Response Corporation (MSRC). MSRC provides spill response capabilities for the West Coast and is the largest oil spill response agency in the country. DCOR obtains an annual certificate of coverage with MSRC, which is renewed in January of each year. MSRC has multiple staging areas and equipment bases with several standby Fast Response Vessels stationed throughout Southern California. A key MSRC facility for Platform Gilda is located in Ventura.

The worst-case discharge (WCD) for the proposed well stimulation activity is less than the current BSEE WCD for Platform Gilda. The WCD for the proposed stimulation activity is the same as Platform Gilda's existing production well blowout scenario of 60 barrels (bbl) (DCOR 2023). BSEE's WCD for Gilda is 1,501 bbl, which includes the scenario of a well blowout occurring simultaneously as a pipeline failure and process vessel failure.

As described in DCOR's approved OSRP, the worst-case scenario specific to the proposed activity is a blowout or uncontrolled release from a production well of up to 60 bbl of oil per day. The example well provided as part of the previously approved WCD was a stimulated Lower Repetto production well in a cased hole scenario, which would be nearly identical to the activity proposed in the Program. This would require a loss of control sequence of events, such as a vessel striking the well conductor, combined with a failure of the subsurface safety valve.

According to BSEE regulations, a blowout of this type is assumed to last for 30 days, leading to a total well blowout WCD volume of 1,800 bbl.

In the case of low-probability catastrophic spills (high-volume, extended-duration oil spill regardless of cause), BOEM does not consider this category of spill to be a reasonably foreseeable effect of the action, since POCSR fields are mature and the majority of reservoirs have low to no pressure and require artificial lift to access the oil.

2.4 WELL STIMULATION SCOPE

The purpose of the proposed well stimulation program is to improve hydrocarbon recovery from low-permeability zones by increasing effective reservoir permeability and bypassing near-wellbore formation damage. Each treatment will be preceded by a DFIT to collect formation-specific pressure and fracture gradient data. This information is used to calibrate stimulation designs using reservoir modeling software. Additional fluid composition and handling details are provided in **Section 2.7** (Waste Management and Flowback Fluid Handling).

Hydraulic fracturing, a method of well stimulation, works by injecting fluids at high pressure into the target formation to create narrow, controlled fractures in the rock. Once the fractures are initiated, a proppant—typically sand or ceramic spheres—is carried into the formation by the fracturing fluid. The proppant remains in the fractures after pressure is released, holding them open to maintain improved flow paths for hydrocarbons. After a standard hydraulic fracturing treatment, all the equipment is removed from the well and the well produces directly through the casing and perforations. The goal is purely to create a conductive pathway for hydrocarbons to flow.

The proposed stimulation method involves “frac packing,” which has some key differences from standard hydraulic fracturing and combines hydraulic fracturing with gravel packing. Frac packing is used in reservoirs that produce loose formation sand, where the operator must prevent that sand from flowing into the wellbore. Due to the relatively low permeability and unconsolidated nature of these sands, well stimulation via frac packing is required to achieve economic production rates and well longevity. During a frac pack, a permanent downhole sand-control system (sand screens) is installed and the fracturing fluid is injected to fracture the formation within the well casing across the perforated interval. Proppant is placed both in the fracture and in the annulus between the casing and immediately adjacent to the screen to form a stable gravel pack. Proppant will be pumped across the sand screen until the area around the screen becomes tightly packed—hence “frac pack.” After pumping stops, the proppant pack is left behind as a stable, permeable barrier that keeps formation sand out while still allowing oil and gas to flow. This technique provides both productivity enhancement and sand control, making it well suited to the unconsolidated sands of the Repetto intervals.

The key components in a frac pack are:

- A screen (downhole filter in the form of a perforated pipe with a specially shaped wire wrapped around it with tightly controlled gap between the wires) placed across the producing zone. This acts like a very strong, permanent strainer.
- A sand control packer above the zone, which seals off the annulus and forces the pumped fluid to go through the perforations and prevents production flow from bypassing the screen and flowing up through proppant pack.
- A specialized surface tool (crossover tool) that allows the crew to direct fluids in several flow paths: pumping down the tubing, returning up the annulus, and reversing out when needed.

2.4.1 Well Selection

Past reservoir simulation studies and recent geologic interpretation have identified four well stimulation target locations in the Upper Repetto (UR) and 12 well stimulation target locations in the Lower Repetto (LR), for a total of 16 locations.

The zones of interest in the Upper Repetto are the LP-B and LP-C subzones which are located greater than 4,500 ft below the seafloor. In the Lower Repetto, the primary targets are the LP-M and LP-N subzones, while the LP-L subzone is considered more marginal and will be evaluated for potential completion based on open-hole log results. **Table 2.4-1** summarizes the 16 well locations proposed for stimulation.

Table 2.4-1. Proposed Wells for Hydraulic Fracturing on Platform Gilda

Well ID	Target Formation	Target Subzone
1 UR	Upper Repetto	B, C
2 UR	Upper Repetto	B, C
3 UR	Upper Repetto	B, C
4 UR	Upper Repetto	B, C
1 LR	Lower Repetto	L, M, N
2 LR	Lower Repetto	M, N
3 LR	Lower Repetto	L, M, N
4 LR	Lower Repetto	M, N
5 LR	Lower Repetto	L, M, N
6 LR	Lower Repetto	M, N
7 LR	Lower Repetto	L, M, N
8 LR	Lower Repetto	M, N
9 LR	Lower Repetto	L, M, N
10 LR	Lower Repetto	M, N
11 LR	Lower Repetto	L, M, N
12 LR	Lower Repetto	M, N

2.5 FRAC PACK TREATMENT DESIGN

Combining historical data from previous stimulation treatments and proposed target zone data provides a basis for estimating the scope and scale of future frac pack treatments. The treatment design parameters summarized in **Table 2.5-1** reflect the combined average of all expected treatments. Final designs will be developed using industry-standard fracture modeling software and tailored to each well using data from acquired open-hole logs.

Each treatment will be further refined following a DFIT. The DFIT involves a small-volume fluid injection at a sufficient rate and pressure to initiate a short fracture. Following injection, the well is shut in and pressure fall-off is monitored over a period of one to two hours. This test provides key information critical for calibrating the frac model and ensuring zone-specific design accuracy.

Table 2.5-1. Average Frac Pack Treatment Parameters

Design Parameter	Amount
Measured Depth (MD) Range	5,900 – 9,300 ft (Upper Repetto) 10,100 – 15,900 ft (Lower Repetto)
Total Vertical Depth (TVD) Range	4,950 – 5,900 ft (Upper Repetto) 7,900 – 8,600 ft (Lower Repetto)
Fracturing Half-Length	150 – 300 ft
Fracturing Height	100 – 200 ft
Water Depth	205 ft
RT to Sea Level	107 ft
Zone Length Range, MD	65 – 319 ft
Zone Length Average, MD	170 ft
Perforated Interval Range	24 – 160 ft
Perforated Interval Average	60 ft
BHST Range	140 – 155 degF (Upper Repetto) 189 – 197 degF (Lower Repetto)
BHST Average	150 degF (Upper Repetto) 193 degF (Lower Repetto)
Perforated Liner Size	5 in and 7 in (about 50/50 split)
Sand Control Screen Size	2-3/8 in for 5-in casing wells; 3-1/2 in for 7-in casing wells
Injection Rate Range	12 – 25 barrels per minute (BPM)
Injection Rate Average	18 BPM
Proppant Volume Range	36,000 – 140,000 lb
Proppant Volume Average	75,000 lb
Clean Fluid Volume Average	1,300 barrels (bbl)
Proppant Slurry Volume Average	1,400 bbl
Maximum Surface Pressure Range	5,000 – 10,000 psi
Hydraulic Horsepower	Up to 5,500 high horsepower (HHP)
Average Main Job Pump Time	Up to 2 hrs

A typical frac pack treatment (stage) will place approximately 75,000 pounds of proppant, although volumes may range from 36,000 to 140,000 pounds depending on reservoir characteristics. Treatment volumes include approximately 1,300 barrels of clean fluid, which equates to 1,400 barrels of slurry after proppant is added, pumped at rates ranging from 12 to 25 barrels per minute (BPM). Surface pressure during treatment is expected to range from 5,000 to 10,000 psi, with a total hydraulic horsepower requirement of up to 5,500 high horsepower (HHP).

Each frac pack stage is expected to take six hours from start to finish. Of this, four hours are dedicated to active pumping operations, and two hours of “standby” for engineering analysis and final redesign. The pumping sequence includes a step-rate test, the DFIT, and the main frac pack job. The main frac pack job typically lasts 40 to 120 minutes.

In approximately 50 percent of cases, if sand placement during the main frac job does not fully cover the screen, a secondary gravel pack will be necessary to ensure complete annular packing. This operation is typically conducted several hours after the main treatment, with an average pump time of 90 minutes. Gravel packs are performed at a lower pump rate than the frac job—typically around five BPM—using a single low-HHP pump and a smaller gravel pack blender. A gravel pack does not induce fracture in the reservoir.

In total, the full stimulation program may include up to 38 frac stages distributed across 16 wells, with each Upper Repetto well expected to require two frac pack stages, and each Lower Repetto well expected to require 2.5 stages, as only half of the Lower Repetto wells are anticipated to include the LP-L subzone. It is anticipated that up to six wells could be stimulated per year, depending on operational logistics, permitting timelines, and equipment availability.

2.6 FLUIDS, ADDITIVES, AND SOURCE MATERIALS

The base fluid for all treatments will be filtered seawater sourced directly from the surrounding marine environment using Platform Gilda’s existing seawater pumps. Seawater is the primary source of fluid for all drilling, completion and production needs offshore. Fracturing fluid is specifically selected on the basis of its compatibility with seawater; not all fluids are compatible with seawater. The fluid will be mixed with chemical additives to form a viscous gel capable of transporting proppant under high-pressure conditions. The primary gelling agent is guar, which will be crosslinked using a borate crosslinker to form a stable gel. An average frac pack treatment will use 1,300 bbl of seawater. **Table 2.6-1** summarizes the key additives that will be used in a frac pack treatment involving 100,000 pounds of proppant. The proppant used will be high-grade silica sand or ceramic proppant defined by an upper and lower grain diameter by sieve, such as 16/30 mesh or 20/40 mesh. All liquid additives will be transported in stainless steel marine-certified totes (typically 330–550-gallon capacity). Dry materials, such as breakers and biocides will be delivered in sealed 5-gallon containers, palletized, and stored in a steel-bottom containment bin (5' x 10') on deck. Spill response materials and handling procedures will be in place per the Platform’s operations management plans (listed in **Section 2.10.3** (Operations Management Plans).

Table 2.6-1. Additive Amounts and Functions for a 100,000-Pound Frac Pack Treatment

Additive	Product ID	Amount	Function
Environmental Guar Slurry	J564	500 gallons	Increases fluid viscosity, allowing the proppant to remain suspended and uniformly transported into the formation.
Surfactant	F103	120 gal	Lowers surface and interfacial tension to improve the cleanup of fracturing fluid and facilitate flow of hydrocarbons
Emulsion Preventer	W054	55 gal	Prevents the formation of oil-water emulsions during treatment and early production, reducing flow assurance risks.
Scale Inhibitor	L065	55 gal	Mitigates the risk of scale precipitation from seawater components such as calcium or barium, helping to protect downhole equipment and reservoir permeability.
Borate Crosslinker	J532	350 gal	Chemically bonds to the guar polymer to enhance viscosity and thermal stability, creating a crosslinked gel suitable for deep, high-pressure formations.
Breaker (encapsulated)	J475	150 lb	Slowly dissolving oxidizer that reduces gel viscosity post-treatment, allowing fluid to break down and be recovered from the formation.
Breaker (raw)	J218	20 lb	Fast-acting oxidizer used for immediate gel breakdown typically used at the end of treatment and flush stages
Biocide	M275	20 lb	Controls microbial growth in seawater that could otherwise lead to corrosion, plugging, or biofilm development in the reservoir or equipment.

2.7 WASTE MANAGEMENT AND FLOWBACK FLUID HANDLING

All flowback fluid generated during stimulation activities will be routed through a closed-loop handling system and retained on the Platform. Returned stimulation fluids will be reinjected into existing approved injection wells on the Platform, and no open ocean discharge of flowback fluids will occur. The fluid flowback process stream is continuous such that the retention time depends on the exact flowback rates coupled with the existing vessel volumes. Depending on the flowback rate the retention time is estimated to be between a few hours and one day. During this time the fluids are not static, but are flowing through the process vessel and flowlines. All stimulation fluid that is produced back to the surface will be reinjected. Consider that each stimulation stage is approximately 1,400 bbls and there would be 2–3 stages per well. It is possible and often observed that stimulation flowback is less than 100 percent of the stimulation fluid volume, resulting in some fluid being left in formation. In this case the stimulation zone and the reinjection zone are the same, so if less than 100 percent stimulation fluid flowback is observed than the outcome is essentially the same with the stimulation fluid remaining the in the same zone either way. The existing injection wells are completed in the same Repetto zones being stimulated and provide reservoir pressure support to the oil producing wells. Well stimulation treatment fluids are covered in the well treatment, completion, and workover fluids category of the NPDES permit (EPA [Environmental Protection

Agency] Permit No. CAG280000). All waste will be disposed of in accordance with the currently approved NPDES permit. The planned stimulation fluid volume of 1,300 bbl per stage for a possible 38 stages would be a total of 49,400 bbl of flowback fluid, or up to approximately 100,000 bbl over a five-year period, if assuming an additional 100 percent contingency. This compares to recent injections of approximately 40,000 bbl per month or historical injection values of more than 300,000 bbl per month. Thus, there is ample injection capacity to reinject the stimulation flowback fluid without concern of induced seismicity from cumulative injection volumes. Current water production from the reservoir is also in excess of 50,000 bbl per month, thus the reservoir will not be over pressurized due to the greater withdraw simultaneously occurring.

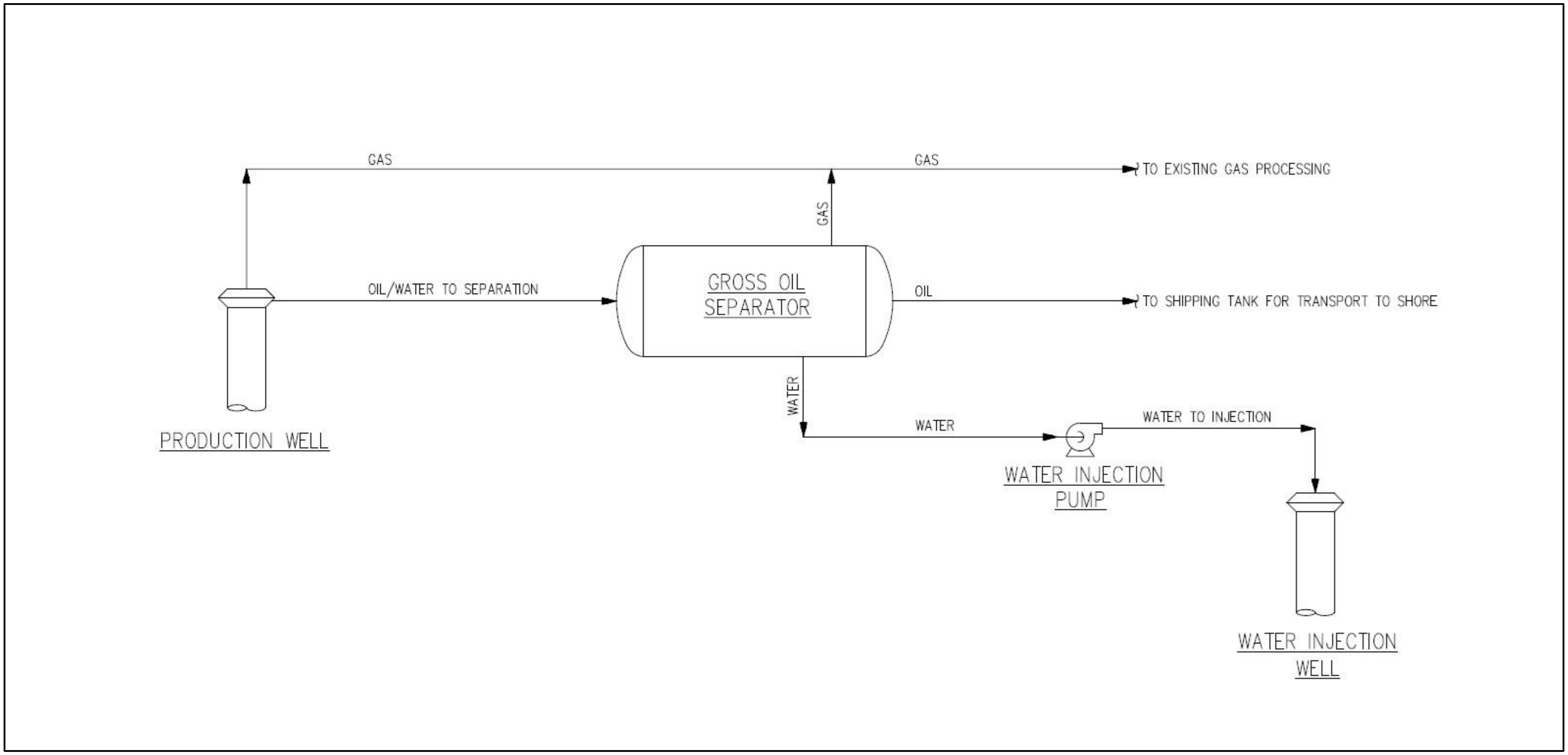

Figure 2.7-1. Platform Gilda Process Flow Diagram: Production Stream Processing. Ventura, California.

Solid waste, such as residual sand or other materials, will be separated and contained for transport to a licensed onshore disposal facility. Crude oil flowback, once achieved, will be separated out and be transported through existing sales pipelines.

2.8 EQUIPMENT, VESSELS, AND EMISSIONS

The proposed stimulation program will use skid-mounted mobile diesel-powered stimulation equipment rigged directly on Platform Gilda. Equipment emissions, power requirements, and operational runtime will vary depending on the final configuration. The Supply Vessel/Crew Transfer Vessel *WMT* proposed for this project is accounted for under the PTO based on its fuel usage.

Operations will be executed as separate campaigns to minimize mobilizations and optimize crew use. Well stimulation equipment will be mobilized using the *WMT* vessel (or an equivalent permitted vessel) and standard transit routes to and from Platform Gilda. Each stimulation stage will be conducted over the course of one day, with approximately three days between each stimulation stage and several weeks between each well. The program is organized as one campaign per year, with all planned stages for that year completed in a single window approximately six to seven months long. The equipment used for WST will remain staged on the Platform for the duration of each campaign and will be demobilized once each campaign is completed.

Equipment and vessel types, power requirements, and operational runtime are summarized in **Table 2.8-1**.

Table 2.8-1. Equipment List

Equipment Type	Tier[1]	Quantity	Horsepower	Total Operating Hours	Total Operating Days
Gel Hydration Unit	Tier 4	1	456 HP	304 hrs	13 days
POD Frac Blender	Tier 4	1	575 HP	228 hrs	10 days
Gravel Pack Blender (optional)	Tier 4	1	575 HP	76 hrs	3 days
2,250 HHP Frac Pumps (frac)	Tier 4	3	1650 HP	684 hrs	29 days
600 HHP Gravel Pack Pump (gravel pack)	Tier 4	1	520 HP	76 hrs	3 days
Primary & Backup Diesel Generators (optional)	Tier 4	2	755 HP	608 hrs	25 days
Control Cabin	N/A	N/A	N/A	N/A	N/A
Sand/Proppant Storage Silos	N/A	N/A	N/A	N/A	N/A
Supply Vessel / Crew Transfer Vessel *WMT*	EPA Tier 3/IMO-2	4	803	880	88

[1]A Tier 4 engine is a designation applied to diesel engines that meet the strictest emissions standards set by the EPA for non-road applications.

2.9 PERSONNEL AND SCHEDULE REQUIREMENTS

Each stimulation job will require a crew of approximately 10 specialized personnel, including crew supervisors, equipment operators, engineers, and safety staff. Personnel will be mobilized to the Platform via crew transfer vessels in coordination with existing Platform logistics.

The stimulation program is planned over a five-year period, with up to six wells stimulated during one campaign in a single year. The program schedule is expected to follow a batch completion model, wherein each year's group of wells is completed during a single annual campaign. Each stage will be performed over one day at the Platform, followed by a three-day period before the next stage. Well stimulation equipment is expected to be active and operating for up to 14 days per year. When active well stimulation is occurring, work would be scheduled for 24/7 operations.

The estimated schedule of activities, including the number of stages, gravel packs, and total operational hours, is summarized in **Table 2.9-1**.

Table 2.9-1. Program Activity Schedule

Activity	Campaign 1	Campaign 2	Campaign 3	TOTAL
Dates	Jan 1, 2028 – Oct 17, 2028	Mar 8, 2030 – Dec 23, 2030	May 13, 2032 – Jan 1, 2033	Jan 1, 2028 – Jan 1, 2033
Number of Days	290 days	290 days	233 days	1,827 days
Number of Upper Repetto Wells	2	2	0	4
Number of Lower Repetto Wells	4	4	4	12
Number of Frac Stages	14	14	10	38
Number of Gravel Packs	7	7	5	19
Frac Hours (6 hrs per stage)	84 hrs	84 hrs	60 hrs	228 hrs
Gravel Pack Hours (4 hrs per gravel pack)	28 hrs	28 hrs	20 hrs	76 hrs

2.10 IMPACT AVOIDANCE AND OPERATOR PROPOSED MITIGATION/SAFETY AND MONITORING PLANS

2.10.1 Protection Measures

BSEE requires continued monitoring and preventive maintenance of all offshore facilities to preserve the integrity of platforms, pipelines, and related equipment. Monitoring and maintenance include equipment, structural, and pipeline inspections, repairs, and preservation of required safety and utility systems. BSEE conducts regular and frequent on-site inspections of offshore platforms and associated pipelines to ensure compliance with safety and operational regulations.

The following measures have been incorporated into the program design as proposed by DCOR:

Closed-Loop Fluids Management. All fluid generated during stimulation activities will be retained on the Platform. Returned stimulation fluids will be reinjected into existing injection wells on the Platform, and stimulation flowback fluids are not discharged directly into the ocean. All the platform decks have existing secondary containment with deck drains that are connected to sump tanks. The secondary containment is already sized to handle all the process vessels, flowlines, rig tanks as well as rain events.

Chemical Handling and Containment. Covered secondary containment; closed-connection transfers over contained deck areas; segregation of incompatible materials.

Well Integrity Verification. An independent registered professional engineer reviews and certifies casing programs for compliance with 30 CFR 250.420. Casing and liners are designed to withstand anticipated stresses, cemented to isolate hydrocarbon-bearing zones, and pressure tested prior to stimulation to confirm mechanical integrity.

Produced-Water Compliance and Monitoring. Continued adherence to NPDES permit limits (oil and grease, whole-effluent toxicity, sheen prohibition).

Program Vessel Traffic. Program vessels will use (or continue to use) the existing USCG Traffic Separation Scheme (TSS) and Joint Oil Fisheries Liaison Office (JOFLO) corridors within the Santa Barbara Channel. Program vessels will operate in accordance with International and USCG regulations and guidelines.

Oil Spill Response and Contingency Plan Implementation. An Oil Spill Response and Contingency Plan (OSRCP) will be implemented during all Program activities in the event of the release of oil or contaminants. The OSRCP will include site-specific details, OSRO coverage, and drills ensure readiness for any vessel- or Platform-related spill.

Prevent Introduction of Non-Native Aquatic Species. All Program vessels will be in compliance with California's state ballast management regulations.

2.10.2 Well Integrity Monitoring and Safety

An independent registered professional engineer will verify and sign all planned casing programs for compliance with 30 CFR 250.420, certifying that they are suitable under expected wellbore conditions and appropriate for permitting. Casing design, including liners, must withstand tensile, compressive, and buckling loads, burst and collapse pressures, thermal effects, and combinations of these stresses.

Production casing will be cemented with sufficient cement to isolate all hydrocarbon-bearing zones above the casing shoe. At a minimum, cement will extend 500 ft measured depth (MD) above the casing shoe and 500 ft above the uppermost hydrocarbon-bearing zone.

Before stimulation, casing and liners will undergo mechanical integrity testing in accordance with 30 CFR 250.427, including pressure testing to the maximum anticipated pressure. The specific nature of the frac packing operation requires the use of a dedicated workstring tubing (a separate tubing, in other words, separate from the production tubing that is used to transport produced oil to the surface). This dedicated workstring is not part of a well and does not remain in the well after the operation is complete. It is used to convey frac pack completion, including sand control packer and screens (downhole sand exclusion filters) to intended depth. Typically, it is either a high-pressure tubing or drill pipe, but in all cases it has a high burst rating and high tensile strength. High-pressure treating lines are connected directly to this workstring. The fracturing injection pressure is contained within this workstring (the workstring being a separate system) and does not act directly on the wellbore casings or surface wellhead.

During each treatment, real-time pressure monitoring will be conducted as required by 30 CFR 250.724, with results recorded by the Platform's data acquisition system and reviewed for any abnormalities by on-site engineers and remote monitoring teams.

Emergency shutoff systems and well-control protocols are in place and will be activated in the event of a sudden pressure increase. These include blowout preventers, emergency shutdown valves, and access to well-kill materials and procedures. All personnel receive pre-job safety briefings and training on response actions specific to hydraulic fracturing operations.

During hydraulic fracturing, high-pressure rated flowline connects the frac pumps to the workstring tubing, and the system is protected by multiple layers of overpressure safeguards. One of the primary safeguards is the automatic pump trip (pump shutdown) system, which continuously monitors pressure. If pressure rises rapidly—beyond a preset high-pressure limit or at a rate of increase that indicates a potential "screen-out"—the system initiates engineering controls and automatically shuts down the pumps. This rapid shutdown prevents further pressure escalation, protects surface flowlines from overstress, and reduces the likelihood of casing or tubular damage. Pump trips are controlled through pump control panels, and the thresholds are selected based on equipment pressure ratings, treatment design, and the expected maximum treating pressure.

In addition to electronic pump trips, mechanical overpressure protection valves are installed, the most common being nitrogen-charged pop-off valves installed on the high-pressure lines feeding the workstring tubing. These devices use a nitrogen-charged dome acting on a piston or diaphragm to hold the valve closed during normal operations. If the treating pressure exceeds the nitrogen dome pressure by a calibrated margin, the valve automatically opens, venting fluid to a designated safe discharge line connected to a holding tank. This provides a fail-safe pressure relief mechanism in case the electronic controls fail.

Nitrogen-charged pop-off valves are used because they respond instantaneously to overpressure, and their cracking pressure can be tuned precisely by adjusting the nitrogen charge. They protect critical components such as flowlines, treatment head, workstring tubing and high-pressure pumps. In a severe pressure spike, the pop-off relieves pressure fast enough to prevent equipment rupture. Mechanical pop-offs are also placed on the lines connected to the work string annulus to protect wellbore casing from over pressurization. All treating lines and pop-off valves follow periodic inspection and pressure testing and labeled with service tags indicating their ready-for-service status. Additionally, all treatment lines and pop-off valves are pressure tested immediately prior to performing fracturing operation to ensure actuation at a predetermined pressure and absence of leaks.

Together, pump trips and nitrogen-charged pop-off valves form a layered pressure-control strategy: electronics prevent most overpressure events, and mechanical relief devices provide last-resort protection. This combination is considered essential for safe and reliable high-pressure fracturing operations.

In addition to these measures, BSEE requires continuous monitoring and preventive maintenance of Platform Gilda and associated facilities and infrastructure to preserve the integrity of the platform, pipelines, and related equipment. Monitoring and maintenance include equipment, structural, and pipeline inspections, repairs, and preservation of required safety and utility systems. A May 2016 report by the Pipeline and Hazardous Materials Safety Administration did not find any indication that infrastructure age is a contributing factor to recent oil spills in the region. (Pipeline and Hazardous Materials Safety Administration 2016).

2.10.3 Operations Management Plans

DCOR currently maintains and implements the following safety and well operations management plans, including:

- Operations & Maintenance Pipeline Manual (O&M Manual)
- Well Integrity Monitoring and Testing Reports
- Regional OSRP with site-specific details including:
    - Worst-Case Discharge Volumes (30 CFR 550.250(b)(iv))
    - Worst-Case Discharge Scenario (30 CFR 550.250(b)(v))
- Coverage with an approved OSRO (MSRC)
- Perform tabletop spill drills as part of a coordinated Incident Management Team (IMT) and perform equipment deployment spill drills.
- Hazardous Waste Operations and Emergency Response training for all employees who are part of an IMT or respond to a spill.
- Emission sources on Platform Gilda will maintain compliance with the requirements of the PTOs issued by the Ventura County Air Pollution Control District (VCAPCD). PTO inspections will be conducted as required.

3.0 ALTERNATIVES TO THE PROPOSED ACTION

This section provides a description of alternatives to the Proposed Action (well stimulation of 16 wells from Platform Gilda) that meet the purpose and need (**Section 1.1**).

3.1 ALTERNATIVE 2: NO ACTION

Under this alternative, DCOR would not perform well stimulation with hydraulic fracturing at Platform Gilda. DCOR would continue to operate Platform Gilda with routine well activity and enhanced oil recovery techniques already approved in the Gilda DPP. DCOR would not be able to improve hydrocarbon recovery from low-permeability zones by increasing effective reservoir permeability and bypassing near-wellbore formation damage.

3.2 ALTERNATIVE 3: DEVELOPMENT OF NEW PRODUCTION WELLS

Under Alternative 3, DCOR would initiate a drilling program approved under the existing DPP. To meet the purpose and need of efficient development of identified hydrocarbon resources, DCOR would rely on drilling additional unstimulated production wells. Alternative 3 would not require an update to the DPP associated with well stimulation activities; however, it would necessitate the drilling of a greater number of wells to achieve comparable recovery of the target reservoirs.

Because unstimulated wells are expected to exhibit significantly lower productivity relative to fracture-stimulated wells, it is anticipated that approximately twice the number of wells would be required to develop the same reserves. This increase in well count would result in a corresponding increase in drilling operations, well construction activities, and associated support services.

3.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM FURTHER EVALUATION

Alternative well stimulation methods, including those evaluated in previous BOEM analyses (Argonne National Laboratory 2016), were considered but eliminated from further evaluation because they would not meet the purpose and need or would not provide a reasonable or effective means of reservoir development. The alternatives considered but eliminated include the following:

1. Alternative Fracturing Methods (Acid Fracturing)

   Acid fracturing was considered as an alternative well stimulation method; however, it was eliminated from further evaluation because it is not technically suitable for the target reservoirs. Acid fracturing is most effective in carbonate formations (e.g., limestone or dolomite), where acid etches fracture faces to create conductive flow paths. The subject reservoirs are predominantly sandstone, where acid fracturing does not provide comparable or predictable stimulation benefits.

   In sandstone formations, acid treatments may result in limited fracture conductivity, uneven etching, or formation damage due to clay and fines mobilization. Additionally, acid fracturing does not provide the proppant-supported fracture geometry required to maintain long-term fracture conductivity in unconsolidated or weakly consolidated sandstones. As a result, acid fracturing would not be expected to materially increase reservoir drainage area or improve sand control performance relative to frac packing.

Because acid fracturing would likely result in lower well productivity, its use would necessitate drilling additional wells to recover the same reserves, leading to increased operational activity and environmental impacts (similar to Alternative 3). Therefore, acid fracturing was determined to be an unreasonable alternative for achieving the program's objectives.

2. Non-Fracturing Well Stimulation Methods (Matrix Acidizing)

Non-fracturing well stimulation treatments, such as matrix acidizing, were also considered and eliminated from further evaluation. Matrix acidizing is primarily intended to remove near-wellbore damage caused by drilling, completion, or production operations and typically affects only a limited radial distance from the wellbore. Though such treatments can restore permeability in damaged zones, they do not significantly extend reservoir contact or increase effective drainage area.

For the subject reservoirs, matrix acidizing would not address the primary development challenges, including limited reservoir deliverability, fines migration, and sand production. These treatments would not provide the sustained productivity enhancement or sand control benefits associated with fracture-stimulated completions. As a result, wells completed using non-fracturing stimulation methods would be expected to exhibit substantially lower production rates and recoveries.

3. Well Stimulation at Less Than 4,500 Feet below Seafloor Surface

Well stimulation treatments at depths shallower than 4,500 ft (1,371 m) below the seafloor surface were also considered but eliminated from further evaluation. The 4,500 ft below seafloor depth was chosen based on current understanding of safe separation distance for environmentally safe operations. A study conducted in 2012 (Davies et al. 2012) assessed data from thousands of fracking operations in the U.S., Europe and Africa to analyze upward vertical propagation distances of stimulated fractures. This study showed the probability of exceeding a > 350 m (1,150 ft) stimulation-induced vertical fracture is less than 1 percent. The 2012 report, which is the only known assessment of its kind, states that in no case has a stimulation-induced fracture propagated more than > 588 m (approx. 1,900 ft)

Various geological interpretations (Brickey and Galloway 1998; Chevron 1976; Padre Associates Inc. 2026) depict the top of the Upper Repetto formation to be its shallowest where it is raised up by the Santa Clara Anticline, a depth of approximately 4,500 ft (1,371 m). Limiting fracture stimulation above this depth leaves a safe separation distance of at least 2,600 ft (792 m) between any stimulation-induced fracture and the seafloor. This distance reduces the potential for unintended fracture propagation into shallow formations, existing faults, or natural fracture systems. This depth restriction also minimizes the risk of any pressure communication or surface expressions that could affect the seafloor or overlying strata.

DCOR established a minimum depth threshold for fracture stimulation to maintain a conservative safety margin between stimulation activities and shallow geologic features.

By excluding fracture stimulation at shallower depths, the Program incorporates an additional protective measure by ensuring that stimulation activities remain confined to deeper, well-characterized reservoir intervals. Consequently, fracture stimulation at depths shallower than 4,500 ft (1,371 m) below the seafloor surface were eliminated from further consideration to enhance environmental protection and operational safety.

4.0 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

The following sections provide biological, physical, and socioeconomic information and impacts analysis about the resources with the potential to be affected by the Proposed Action and Alternatives.

4.1 AFFECTED ENVIRONMENT

4.1.1 Geology and Seismicity

This section details the geologic setting of the Affected Environment, including existing geological and ocean-bottom conditions. This section also describes existing baseline conditions and serves as a detailed description of the environment under the No Action Alternative.

4.1.1.1 Regional Geology

The offshore Affected Environment is located on the Ventura Shelf and lies within the offshore extension of California's Transverse Range geomorphic province. The geology of southern Ventura County is dominated by the Ventura Basin, a sedimentary trough that extends westward into the Santa Barbara Channel. The Santa Barbara Channel is a partly submerged west-trending topographic and structural depression that is bounded by the Santa Ynez Mountains and the Santa Ynez Fault Zone to the north and by the California Channel Islands to the south (Vedder et al. 1969). Platform Gilda is situated on the Ventura Mainland Shelf, which, together with the Mugu Shelf to the south, forms the offshore extension of the Oxnard Plain.

Sedimentary strata underlying the Program area include fluvial and deltaic deposits ranging from Cretaceous to Holocene in age. Platform Gilda lies on Pleistocene and Holocene unconsolidated sands and mud, which overlie Pliocene marine sands, clays, and siltstones of the Pico and Repetto Formations. Deeper and older sediments, including the Miocene Monterey Formation, generally consist of interbedded marine sandstones, siltstones, and shales (Standard Oil Company of California 1976).

4.1.1.2 Faults and Seismicity

The U.S. Geological Survey (USGS) maintains information on faults and associated folds that demonstrate co-seismic surface deformation in large earthquakes during the last 2.58 million year, a period of time known as the Quaternary period. This database contains information on geographic, geologic and paleoseismic parameters that are deemed critical to making geologic assessments of seismic hazards. This database serves as the national reference for identifying potentially active faults that may generate significant earthquakes and was consulted when assessing the risk of faults and seismicity in the Program area (USGS 2020).

The Affected Environment is near significant regional structural features, all generally trending east-west within the Santa Barbara Channel (Standard Oil Company of California 1976). On a broad scale, the Program area lies within the offshore portion of the Oak Ridge-Montalvo Trend, which is an anticlinal trapping structure that is bounded at depth by the Quaternary aged Oak Ridge Fault to the north. The Oak Ridge Fault is the closest mapped Quaternary fault to Platform Gilda and lies approximately 2.5 miles north of the Platform. This fault is a south-dipping thrust fault that stretches from Piru, California in the east to about 12.4 miles offshore, south of Santa Barbara in the west (Southern California Earthquake Data Center 2025). As the Oak Ridge fault moves offshore, the fault splits into two strands: the southerly Oak Ridge Fault, which slips about 1.2 inches per decade, and the northerly Oakridge-Mid-Channel Fault, which slips about 0.4 inches per decade (Ross et al. 2004). Because the offshore portion of the Oak Ridge Fault is a "blind" thrust fault, meaning its main strands are below ground and do not clearly reach the seafloor, surface rupture is unlikely; however, surface deformation of the seafloor may still occur (Ross et al. 2004).

Additional mapped USGS Quaternary faults in the vicinity of the Program area include the Mid-Channel Fault and the Montalvo Fault, both are located over two miles south of the Platform and not intersecting the zones proposed for stimulation. The Santa Ynez, Red Mountain, and Pitas Point Faults lie farther north and can produce magnitude 6.5 or greater earthquakes, causing ground shaking, surface breaks, liquefaction, landslides, and tsunamis. The Oak Ridge Fault can produce an earthquake up to magnitude 7.1. These faults also do not intersect zones proposed for stimulation.

Field-scale level fault systems, such as the World's End fault System, do not appear in the USGS database. It is possible this fault may be an unmapped strand of the Mid-Channel Fault, however, studies on this particular fault system are lacking, or the fault is too small to meet USGS criteria for inclusion in the database.

Earthquakes are common in Ventura and Santa Barbara Counties, as well as in the Santa Barbara Channel. In 1812, an earthquake with an estimated magnitude of 7 struck the Santa Barbara Channel, causing significant destruction. Other notable earthquakes that have occurred in the Santa Barbara Channel between the period of 1925 and 1978 had magnitudes ranging from 5.1 to 6.3 and were documented to cause damage in Ventura (Ross et al. 2004).

Earthquakes occurring naturally can potentially damage both surface and subsurface oil and gas infrastructure (Kang et al. 2019). On the surface, the site placement for Platform Gilda was originally determined to be able to safely support the structure and incorporated earthquake design criteria for the platform to avoid or minimize structural damage caused by ground acceleration during an earthquake (1976-10 Platform Gilda DPP; Standard Oil Company of California 1976).

In the subsurface, oil and gas well workover operations routinely consider seismic hazards. Literature searches have not revealed any known instances of large (> 6 magnitude) regional earthquakes occurring during actual workover operations. As such, wellbore damage during simultaneous seismic events and a 6-hour frac pack treatment should be viewed as highly improbable. Workover safety procedures, such as the use of safety valves and the ability for an operator to cease pumping of well stimulation fluids (i.e., shut-in a well) further mitigate the issue. This is because well stimulation fluids will only enter the formation while under pressure above the formation's fracture pressure. As soon as pumping at the surface stops, the fluid is no longer receiving energy and a rapid pressure drop occurs at the wellbore.

Finally, wellbores are designed with numerous barriers to limit fluid migration. These include multiple layers of steel casing and cement (King and King 2013). A shearing event, such as an earthquake, does not always cut a well apart but more typically deforms the steel casing and effectively closes the wellbore (Jacobs 2020).

4.1.1.3 Bathymetry and Seafloor Features

The seafloor beneath and surrounding Platform Gilda is located on a gently sloping continental shelf surface in approximately 200 ft (60.9 m) of water on the Ventura Mainland Shelf. This area forms part of a low-gradient outer shelf that deepens gradually seaward into structurally controlled basins. Regional geologic mapping indicates that the natural seabed in this area is relatively smooth and gently dipping, consistent with a shelf setting (Macpherson and Bernstein 1980).

Offshore oil and gas platforms commonly support fouling organisms that attach to platform structures. Periodic removal and natural detachment of these organisms can result in the accumulation of shell material on the seafloor, forming localized shell mounds. Shell material may accumulate beneath any platform with fouling organisms; however, in deeper waters, stronger currents and longer "fall times" of shells and fine sediments result in broader dispersion of material and lower-relief accumulations.

Several geophysical surveys have been conducted within the past 20 years in the vicinity of Platform Gilda, including multibeam surveys and investigations of seafloor shell mounds (MEC Analytical Systems Inc. and Sea Surveyor Inc. 2003; Sea Surveyor Inc. 2001; Weston Solution Inc. and Science Applications International Corporation 2005). These surveys indicate that the largest and most detectable seafloor shell talus areas are found under platforms that are located in shallow, flat bottom areas (generally less than 350 ft (106 m) water depth and less than 1 percent slope). The seafloor at and around Platform Gilda is sedimentary, comprised of medium to fine grain sand and silts. Historic removal and deposition of fouling organisms on the seafloor created mid- to low-relief habitat comprised primarily of fragments of mussel shells (Mytilus sp.). The Program activities do not include any components that would have an effect on the seafloor or sediments including shell mounds beneath and surrounding the Platform.

4.1.1.4 Submarine Landslides

High-resolution bathymetric mapping of the Santa Barbara Channel has identified several medium to very large submarine landslide deposits associated with steep slopes at shelf breaks and basin margins (Ross et al. 2004). However, Platform Gilda is situated on a uniform, gently sloping ocean floor where gradients are low, as described above. The seafloor underlying and surrounding Platform Gilda lacks steep slopes or other geomorphic features typically associated with large submarine landslides, and no mapped submarine landslides have been identified in the immediate vicinity of the Platform.

4.1.1.5 Oil and Gas Reservoirs and Seepage

Both structural and stratigraphic traps control hydrocarbon accumulation in the Santa Clara Field. Structurally the field occupies the crest and northern flank of an anticlinal trend referred to as the Santa Clara Anticline (Brickey and Galloway 1998). The southern boundary of the field is defined by the World's End Reverse Fault system, which acts as a trapping structure for the field, specifically the Upper Repetto Formation. This fault exhibits up to 500 ft (152 m) of vertical displacement based on geophysical depth mapping conducted in 2015 (Redin and Hopps 2016). Available geophysical interpretations indicate that the World's End Fault does not exhibit a seafloor expression and does not extend upward into shallow sedimentary units or the seabed.

In addition to the structural trap mechanism, lateral thinning of sandstones to zero thickness create wedge shaped features known as pinch outs. In addition to the structural trap mechanism that controls hydrocarbon accumulations in the Upper Repetto Formation, another trapping mechanism is also present in the Santa Clara field. Lateral thinning of sandstones to zero thickness create wedge shaped features known as pinch outs. These wedge shaped sedimentary features restrict the flow of fluids and form stratigraphic traps. A series of these stratigraphic traps is present in the Lower Repetto, which does not rely on the sealing mechanism created by the World's End Fault system for hydrocarbon entrapment.

Natural hydrocarbon seepage occurs in portions of the Santa Barbara Channel; however, regional mapping indicates that seep fields are spatially clustered and are not uniformly associated with offshore oil and gas fields. Studies of seep distribution show that the most prominent seep areas are concentrated along the northern margin of the Channel, rather than in the vicinity of Platform Gilda (Lorenson et al. 2009; Quigley et al. 1999; USGS 2011; Woods Hole Oceanographic Institution 2012). Based on available geologic and regulatory sources, no natural oil or gas seeps or seep-related seafloor features have been documented in the immediate vicinity of Platform Gilda (Love 2019; USGS 2011).

4.1.2 Air Quality and Greenhouse Gases

Platform Gilda is located offshore of the South Central Coast Air Basin (SCCAB) and is under the jurisdiction of the VCAPCD. The VCAPCD shares responsibility with the California Air Resources Board (CARB) for ensuring that all ambient air quality standards are attained within Ventura County. The Platform operates under existing PTO Number 01492. The PTO establishes thresholds for allowable emissions and fuel throughput associated with Platform operations.

4.1.2.1 Regional Overview

The Program area has a Mediterranean climate that is characterized by mild winters and warm, dry summers. The influence of the Pacific Ocean causes mild temperatures year-round along the coast, while inland areas experience a wider range of temperatures.

The regional climate within the vicinity of the Program area is dominated by a strong and persistent high-pressure system, the Pacific High, which frequently lies off the Pacific Coast. The Pacific High shifts northward or southward in response to seasonal changes or the presence of cyclonic storms. In its usual position to the west, the Pacific High produces an elevated temperature inversion.

An inversion is characterized by a layer of warmer air above cooler air near the ground surface. Normally, air temperatures decrease with altitude, however in an inversion the temperature of the air increases with altitude. The inversion acts like a lid on the cooler air mass near the ground, preventing pollutants in the lower air mass from dispersing upward beyond the inversion "lid." This phenomenon results in higher concentrations of pollutants trapped below the inversion. This weather pattern is intensified by mountain ranges that surround the SCCAB which constrain the horizontal movement of air and inhibit the dispersion of air pollutants out of the region.

Airflow plays a significant role in the dispersal of pollutants. Local winds are normally controlled by the location of the Pacific High. Typical wind speeds in the area are generally light, which is another factor that contributes to higher concentrations of pollutants because low wind speeds minimize dispersion of pollutants. The sea breeze comes from the southwest, which blows air from the coastline eastward and inland. This weather pattern tends to blow pollution from the coastline inland, which then becomes trapped in the inversion discussed above, contributing to the poor air quality in the SCCAB. When the Pacific High weakens, a Santa Ana condition can develop with air traveling westward toward the coast from the warmer desert regions eastward. Santa Ana winds can flush the basin of pollution; however, stagnant air often occurs following a Santa Ana condition, causing a buildup of pollutants offshore.

4.1.2.2 Air Contaminants

Criteria Pollutants

Criteria air pollutants are those contaminants for which ambient air quality standards have been established for the protection of public health and welfare. Criteria pollutants include ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), carbon monoxide (CO), and particulate matter (PM). In addition, a larger range of nitrogen oxides (NO_x), and volatile organic compounds (VOCs) can function as precursor pollutants forming some of the above criteria pollutants after being released into the atmosphere. Note that VOCs and reactive organic gases (ROGs) are similar, although VOCs include all evaporative organic compounds, not just those that form O_3. Lead, though a criteria pollutant, is not emitted in measurable quantities from OCS oil and gas activities.

Ozone (O_3). O_3 is formed in the atmosphere through complex photochemical reactions involving NO_X, ROGs, and sunlight, occurring over several hours. Because O_3 is not emitted directly into the atmosphere but is formed as a result of photochemical reactions, it is classified as a secondary or regional pollutant. These O_3-forming reactions take time; therefore, peak ozone levels are often found downwind of major source areas. O_3 is considered a respiratory irritant and prolonged exposure can reduce lung function, aggravate asthma, and increase susceptibility to respiratory infections. Children and those with existing respiratory diseases are at the greatest risk from ozone exposure.

Carbon Monoxide (CO). CO is primarily formed through the incomplete combustion of organic fuels. Higher CO values are generally measured during winter when dispersion is limited by morning surface inversions. Seasonal and diurnal variations in meteorological conditions lead to lower values in summer and in the afternoon. CO is an odorless, colorless gas. CO affects red blood cells in the body by binding to hemoglobin and reducing the amount of oxygen that can be carried to the body's organs and tissues, which can cause health effects to those with cardiovascular disease and can affect mental alertness and vision.

Nitric Oxide (NO). NO is a colorless gas formed during combustion processes which rapidly oxidizes to form nitrogen dioxide (NO_2), a brownish gas. The highest nitrogen dioxide values are generally measured in urban areas with heavy traffic. Exposure to NO_2 may increase the potential for respiratory infections in children and cause difficulty in breathing even among healthy persons and especially among those with asthma.

Sulfur Dioxide (SO_2). SO_2 is a colorless, reactive gas that is produced from burning sulfur-containing fuels, such as coal and oil, as well as by other industrial processes. Generally, the highest concentrations of SO_2 are found near large industrial sources. SO_2 is a respiratory irritant that can cause the narrowing of the airways, leading to wheezing and shortness of breath. Long-term exposure to SO_2 can cause respiratory illness and aggravate existing cardiovascular disease. Note that some regulatory authorities regulate the full range of sulfur oxides (SO_x).

Particulate Matter (PM). Ambient air quality standards have been set for particulate matter with a diameter of 10 microns or less (PM_{10}), also known as course particulate matter, and particulate matter with a diameter of 2.5 microns or less ($PM_{2.5}$), also known as fine particulate matter. Both consist of different types of particles suspended in the air, such as metal, soot, smoke, dust and fine mineral particles. The particles' toxicity and chemical activity can vary, depending on the source. The primary source of PM_{10} emissions appears to be from the soil via road use, construction, agriculture, and natural windblown dust; other sources include sea salt, combustion processes (such as those in gasoline or diesel vehicles), and wood burning. Primary sources of $PM_{2.5}$ emissions come from construction sites, wood stoves, fireplaces, and diesel truck exhaust. PM is a health concern because when inhaled, it can cause permanent lung damage. Both sizes of particulates can be dangerous when inhaled, but $PM_{2.5}$ tends to be more damaging because it remains in the lungs longer.

Toxic Air Contaminants

Over 800 substances have been identified by the EPA and the CARB that are emitted into the air and may adversely affect human health. Due to the cancer risk associated with exposure to diesel particulate matter (DPM), this substance has been targeted for risk reduction by the CARB.

The combustion of diesel fuel in truck engines (as well as other internal combustion engines) produces exhaust containing compounds that have been identified as hazardous air pollutants by EPA, and as toxic air contaminants (TACs) by the CARB. DPM from diesel exhaust has been identified as a TAC. The Multiple Air Toxics Exposure Study in the South Coast Air Basin (MATES IV) indicates DPM is a major contributor to cancer risk in southern California associated with TACs, accounting on average for 68 percent of the total risk (South Coast Air Quality Management District 2015). NO_x and DPM are currently controlled through the use of selective catalytic reduction control systems and diesel exhaust fluid, respectively on all new diesel trucks and heavy equipment. In addition, fleets of older trucks are required to phase in the installation of exhaust particulate filters.

Sources of TACs in the Project region onshore include mobile sources (motor vehicles, trains, equipment) and stationary sources such as dry cleaners (perchloroethylene emissions) and gasoline dispensing stations (vapor emissions of benzene and other components of gasoline). Source of TACs in the Program region offshore includes commercial marine vessel and recreational vessels.

Greenhouse Gases

BOEM analyzes life cycle greenhouse gas emissions when analyzing scenarios involving oil and gas production. Greenhouse gases (GHGs), defined as any gas that absorbs infrared radiation in the atmosphere, include, but are not limited to, water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorocarbons. These GHGs trap infrared radiation, allowing heat to build up in the atmosphere near the earth's surface, commonly known as the Greenhouse Effect. Energy-related activities generated 88 percent of the total U.S. emissions on a carbon-equivalent basis in 1990 and 90 percent in 2022. Fossil fuel combustion represents the vast majority of energy-related GHG emissions, and CO_2 is the primary GHG (EPA 2024).

Greenhouse Gas Life Cycle Emissions. The term "life cycle" encompasses all emissions generated throughout oil and gas exploration, development, production, refining, storage, transportation, and end-use consumption. For hydrocarbon resources, these stages are conventionally categorized as upstream, midstream, and downstream as defined below.

- Upstream: Exploration, development, and extraction of oil and gas
- Midstream: Refining, processing, storage, and transportation of oil and gas
- Downstream: Consumer consumption of resulting fuel

To estimate the impact of OCS oil and gas life cycle GHG emissions BOEM uses several GHG emissions models to estimate lifecycle emissions for OCS projects. For details on GHG emissions models used to estimate Program GHG emissions, see **Section 4.2.2**.

4.1.2.3 Regulatory Setting

Federal and State

The EPA has jurisdiction under the Clean Air Act (CAA) and its amendments. The CARB has jurisdiction under the California Clean Air Act and California Health and Safety Code. The EPA and CARB classify an area as attainment, unclassified, or non-attainment, depending on whether the monitored ambient air quality data show compliance, insufficient data to determine compliance, or non-compliance with the National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS), respectively.

The EPA established NAAQS to protect public health (primary standards) and welfare (secondary standards). Air basins are classified by the EPA as in "attainment" or "non-attainment" based on meeting the NAAQS. The CARB established the more stringent CAAQS, which also requires air basins to be designated as in "attainment" or "non-attainment" based on meeting the CAAQS. NAAQS and CAAQS have been established for O_3, CO, NO_2, SO_2, PM_{10} and $PM_{2.5}$ and lead. In addition, California has standards for H_2S, sulfates and visibility-reducing particles. **Table 4.1-1** lists applicable ambient air quality standards.

Table 4.1-1. Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard	Federal Standard
Ozone (O_3)	1-Hour	0.09 ppm	--
Ozone (O_3)	8-Hour	0.070 ppm	0.070 ppm
Carbon monoxide (CO)	1-Hour	20 ppm	35 ppm
Carbon monoxide (CO)	8-Hour	9.0 ppm	9 ppm
Nitrogen dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm	0.053 ppm
Nitrogen dioxide (NO_2)	1-Hour	0.18 ppm	100 ppb
Sulfur dioxide (SO_2)	Annual Arithmetic Mean	--	0.030 ppm
Sulfur dioxide (SO_2)	24-Hour	0.04 ppm	0.14 ppm
Sulfur dioxide (SO_2)	3-Hour	--	0.5 ppm (secondary)
Sulfur dioxide (SO_2)	1-Hour	0.25 ppm	75 ppb
Course Particulate Matter (PM_{10})	Annual Geometric Mean	20 $\mu g/m^3$	--
Course Particulate Matter (PM_{10})	24-Hour	50 $\mu g/m^3$	150 $\mu g/m^3$
Fine Particulate Matter ($PM_{2.5}$)	Annual Geometric Mean	12 $\mu g/m^3$	12.0 $\mu g/m^3$
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	--	35 $\mu g/m^3$
Hydrogen aulfide (H_2S)	1-Hour	0.03 ppm	--
Vinyl chloride	24 Hour	0.01 ppm	--

Pollutant	Averaging Time	California Standard	Federal Standard
Sulfates	24 Hour	25 µg/m3	--
Lead	30 Day Average	1.5 µg/m3	--
Lead	Calendar Quarter	--	1.5 µg/m3
Lead	Rolling 3-Month Average	--	0.15 µg/m3
Visibility Reducing Particles	8-Hour	Extinction coefficient of 0.23 per kilometer – visibility of 10 miles or more due to particles when relative humidity is less than 70 percent.	--

Notes: µg/m3 – micrograms per cubic meter
ppm – parts per million
Source: California Air Resources Board (2024)

Air Quality Regulation and Planning. The VCAPCD shares responsibility with the CARB for ensuring that all state and federal ambient air quality standards are attained within the SCCAB. The Program area is located in the jurisdiction of the VCAPCD. **Table 4.1-2** summarizes the current federal and state air quality attainment status within the SCCAB.

Table 4.1-2. Federal and State Air Quality Attainment Status within the SCCAB

Criteria Pollutant	Standard	Status
1-Hour O^3	NAAQS	Attainment
1-Hour O^3	CAAQS	Non-attainment
8-Hour O^3	NAAQS	Non-attainment
8-Hour O^3	CAAQS	Non-attainment
1-Hour and 8-Hour CO	NAAQS	Attainment
1-Hour and 8-Hour CO	NAAQS	Attainment
1-Hour NO_2	NAAQS	Attainment
1-Hour NO_2	CAAQS	Attainment
Annual NO_2	NAAQS	Attainment
Annual NO_2	CAAQS	Attainment
1 Hour and 24 Hour SO_2	NAAQS	Attainment
24 Hour $PM_{2.5}$	NAAQS	Attainment
Annual $PM_{2.5}$	NAAQS	Attainment
Annual $PM_{2.5}$	CAAQS	Attainment
24 Hour PM_{10}	NAAQS	Attainment
24 Hour PM_{10}	CAAQS	Non-attainment
Annual PM_{10}	CAAQS	Non-attainment
3-Month Lead	NAAQS	Partial Attainment
1-Hour H_2S	CAAQS	Attainment
24-Hour Sulfates	CAAQS	Attainment

Criteria Pollutant	Standard	Status
24-Hour Vinyl Chloride	CAAQS	Attainment

Source: VCAPCD 2025, Unclassified status indicates that there is insufficient data to determine whether an air basin or county is in attainment or non-attainment.

The CAA requires states to prepare a State Implementation Plan (SIP) outlining an approach that brings the state into attainment in all locations where the criteria pollutants are not currently in attainment. The most recent State Strategy for the SIP identifies the strategies and controls under State authority that are being used to reduce concentrations of ground-level ozone (California Air Resources Board 2022a). These measures are needed to meet the federal 70 parts per billion (ppb) 8-hour ozone standard (70 ppb O_3 standard) set by the EPA in 2015, and which SCCAB is currently in non-attainment under the NAAQS.

California Commercial Harbor Craft[1] (CHC) Regulations (13 California Code of Regulations [CCR], Section 2299.5 and 17 CCR, Section 93118.5) in accordance with 13 CCR, Section 2299.5 (Fuel Requirements, Emission Limits and Other Requirements for Commercial Harbor Craft), CARB requires the use of at least 99 percent renewable diesel with a maximum sulfur content of 0.0015 percent or 15 ppm within Regulated California Waters. The CHC defines California Regulated Waters as 24 nautical miles (nm) seaward of the California coastline. Additionally, a CHC Regulation was adopted by CARB in 2008 to reduce emissions of DPM, NO_x, and VOCs from diesel engines used on CHCs operated in Regulated California Waters. The rule was then amended in 2010 and again in 2022, and has been fully implemented since 2023 (California Air Resources Board 2023; 2026).

Cap-and-Trade Program. CARB approved the Cap-and-Trade Program (Cap-and-Trade) in 2011. Cap-and-Trade sets a limit, or a cap, on the total emissions of GHGs in the state, and this cap declines by approximately 5 percent per year through 2030. The program applies to emissions that cover approximately 80 percent of the state's GHG emissions. Covered entities[2] are required to obtain GHG allowances to cover their GHG emissions. GHG allowances are issued by CARB or can be purchased from CARB or other entities subject to the Cap-and-Trade Program. A GHG allowance is a tradable permit to emit 1 metric ton of carbon dioxide equivalent ($MTCO_2e$) of GHGs within the compliance year. In addition, covered entities can obtain GHG offset credits by implementing emissions reduction activities at other facilities.

VCAPCD Rules and Regulations

The VCAPCD issues air permits covering regulated pollutants within their jurisdiction, including the most recent permit for Platform Gilda (Ventura County Air Pollution Control District 2018).

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[1] Per California Commercial Harbor Craft regulation, a Commercial Harbor Craft is defined as, but is not limited to, passenger ferries, excursion vessels, tugboats, ocean-going tugboats, towboats, push-boats, crew and supply vessels, work boats, pilot vessels, supply boats, fishing vessels, research vessels, hovercraft, emergency response harbor craft, and barge vessels that do not otherwise meet the definition of ocean-going vessels or recreational vessels.

[2] Entities that emit 25,000 or more MTCO2E per year.

To operate, the facility will have to receive and comply with an updated permit from VCAPCD. The permit must adhere to both the SIP, as well as state and federal laws and regulations. Once issued the permit functions like any other PTO issued by the VCAPCD.

Air permits are issued under the New Source Review (NSR) rule which is applicable to new, replacement, modified or relocated emissions units within Ventura County jurisdiction. This will, as it has in the past, apply to Platform Gilda. The NSR rule provides specifications on permitting related mitigations such as Best Available Control Technology (BACT) and offsets based on the NSR emissions thresholds (see **Table 4.1-3**). BACT requirements are defined in federal and state statutes, and the implementation of each air district's program varies across California. Federal BACT applies to major new and modified stationary sources. California BACT is the more stringent level of BACT but is only defined under state law for the South Coast Air Quality Management District. California BACT allows air districts to require controls beyond Lowest Achievable Emissions Rate if they are found to be both technologically feasible and cost-effective.

Table 4.1-3. VCAPCD New Source Review Emissions Thresholds

Criteria Pollutant	Threshold (Tons/year)
NO_x	5
ROGs	5
PM_{10}	15
SO_x	15

4.1.3 Water Quality

The Santa Barbara Channel, which stretches from Point Conception to Point Mugu within the Southern California Bight (SCB), generally exhibits good offshore water quality due to relatively low coastal population density and the lack of large industrial pollutant sources compared to areas farther south (Bedsworth et al. 2018; Southern California Coastal Water Research Project 2007). Past regional surveys found that over 99 percent of SCB waters met California Ocean Plan objectives for dissolved oxygen and clarity, a trend that applies within the Santa Barbara Channel (MMS 2005; Southern California Coastal Water Research Project 1998). Since the implementation of the NPDES program and the Clean Water Act (CWA), mass emissions of nearly all major pollutants to the SCB have declined substantially. Regional studies document overall mass reductions greater than 65 percent with metals decreasing ~88 percent, and chlorinated hydrocarbon loads declining by orders of magnitude, along with long-term effluent improvements from large publicly owned treatment works (POTWs) over the past five decades (Lippman et al. 2023; Lyon and Stein 2009; MMS 2001). Ranges for key water quality parameters offshore Southern California, including the Santa Barbara Channel, are summarized in **Table 4.1-4**.

Table 4.1-4. Key Regional Water Quality Parameters Offshore Southern California

Parameter	Characteristics
Temperature	~12–13 °C at the surface in April, increasing to ~15–19 °C in July–October.
Salinity	~33.2–34.3 ppt.
Dissolved Oxygen	~5–6 mL/L at the surface; decreases with depth to ~2 mL/L at 200 m and to ~1 mL/L below ~350 m; upwelling can bring low-oxygen water toward the surface in late spring–summer.
pH	~7.8–8.1 from surface through the upper water column.
Nutrients	Nitrogen, phosphorus, silica (plus micronutrients such as Fe, Mn, Zn, Cu, Co, Mo, V, vitamins B12 and thiamin). Depleted near the surface, increase with depth; episodically elevated during upwelling.
Suspended Sediment (turbidity)	~1 mg/L in nearshore surface waters (higher near bottom and after storms); ~0.5 mg/L offshore. Highest turbidities during strong upwelling, high primary production, and river-runoff periods.
Metals & Organics	Trace metals/organics occur at low background levels; elevated concentrations can occur near outfalls, in embayments/marinas, or within natural seep influence.

Source: Argonne National Laboratory (2019).
FE = iron; Mn = manganese; Zn = zinc; Cu = copper; Co = cobalt; Mo = molybdenum; V= vanadium

4.1.3.1 Non-Point Source Pollution

Non-point source inputs are led by storm-season runoff and atmospheric deposition. The Santa Clara and Ventura Rivers provide the Santa Barbara Channel's largest freshwater inputs; they drain predominantly agricultural lands with additional urban storm-drain contributions. Runoff is largely untreated; plume events can extend across the Santa Barbara Channel and reach the Northern Channel Islands during major storms (Sea Surveyor Inc. 2001; Weston Solution Inc. and Science Applications International Corporation 2005). Atmospheric fallout from metropolitan areas also contributes contaminants on a regional scale (Kaplan et al. 2010; Lyon and Stein 2010).

4.1.3.2 Point Source Pollution

Point sources include municipal POTWs, industrial outfalls, and harbor/marina discharges. Six POTWs discharge to the Santa Barbara Channel; each is classified as a small discharger (design flow less than 25 million gallons per day) and provides at least secondary treatment consistent with current NPDES permit requirements and the California Ocean Plan (California Regional Water Quality Control Board NPDES permits; California State Water Resources Control Board 2019; Lippman et al. 2023). Other inputs include dredging and disposal activities, vessel traffic, military uses, and offshore oil and gas operations. Offshore discharge from past and present oil and gas operations includes cooling water, produced water, sanitary waste, fire control system test water, well completion fluids, and other miscellaneous liquids. Of these, produced water represents the greatest discharge of petroleum-related chemical constituents (Argonne National Laboratory 2016). Well completion and treatment fluids represent the second largest (but relatively minor) source of chemical discharges to OCS waters.

For drilling operations, oil platforms were reported to have discharged 12,128 and 2,955 metric tons of mainly drill cuttings to the SCB in 1996 and 2000, respectively (Argonne National Laboratory 2016). There is no current discharge of drill cuttings on Platform Gilda.

Produced water is brought to the surface during oil and gas production. Produced water is a mixture (an emulsion) of oil, natural gas, and formation water (water naturally occurring in a formation), as well as any specialty chemicals that may have been added to the well for process purposes (e.g., biocides and corrosion inhibitors). The majority of produced water (58 percent) is reinjected into offshore injection wells while the remaining produced water is either discharged to the ocean or injected into onshore injection wells (Argonne National Laboratory 2016). Platform Gilda's produced water goes to shore and is separated at the facility at Mandalay, which also receives fluid from nearby Platform Gina. The separated water from Gilda and Gina is then sent back offshore and is discharged into the ocean per allowances under the NPDES permit. Besides produced water, platform operations produce a variety of other liquid wastes. The majority of this discharge is seawater that has been used for various purposes on the platforms (i.e., cooling water, fire control system water), which is then discharged back to the ocean in accordance with NPDES permit requirements. In 2005, discharges from 23 oil platforms in the Pacific OCS totaled 60 billion L, of which 16 percent was produced water (Lyon and Stein 2010). Operational discharges accounted for the remaining volume, 99 percent of which was cooling water. Fire control system water, sanitary and domestic wastes, deck drainage, and minor discharges contributed the remaining 1 percent of this volume.

Other platform discharges may include chemicals associated with well treatment, workover, and completion fluids (Kaplan et al. 2010). These chemicals include production-treating chemicals, gas-processing chemicals, and well stimulation and workover chemicals. After injection and use, WST fluids return to the platform at diluted concentrations as part of the produced water and crude oil streams. Oil, gas, and water are separated, and the component of WST fluids included in the produced water steam is treated and discharged along with those produced under the NPDES general permit. The Proposed Action would reinject all the well stimulation fluid flowback into injection wells on Platform Gilda.

Though offshore oil and gas is a relatively small point-source contributor overall, hydrocarbons from those activities are proportionally higher than many other anthropogenic sources; however, the Santa Barbara Channel's dominant hydrocarbon source is natural oil and gas seepage, which produces localized surface sheens and tar-ball strandings after weathering (Farwell et al. 2009; Hostettler et al. 2004; Lyon and Stein 2010; Sea Surveyor Inc. 2001).

4.1.3.3 Nutrients

Coastal waters of the SCB, including the Santa Barbara Channel, are generally nitrogen-limited. Four major sources deliver nitrogen: ocean upwelling (nitrate-dominated), POTW effluents (ammonium-dominated), riverine discharges (roughly 60 percent organic N and ~35 percent nitrate), and atmospheric deposition (primarily nitrate) (Howard et al. 2012; Howard et al.2014). At the SCB-wide scale, upwelling supplies the largest total nitrogen load by an order of magnitude; however, at local scales within the Santa Barbara Channel, anthropogenic inputs can be comparable to natural sources. In the Santa Barbara sub-region, net annual downwelling reduces natural nitrogen inputs, so effluent and atmospheric deposition represent the dominant sources; in the Ventura sub-region, effluent, atmospheric, and riverine contributions are of similar magnitude (Howard et al. 2014).

4.1.3.4 Harmful Algal Blooms

The frequency of harmful algal blooms has increased even as overall water quality has improved under NPDES controls. Blooms arise from natural upwelling cycles (Kaplan et al. 2010), with nutrient inputs from effluents and runoff potentially amplifying events locally (Howard et al. 2012). The Santa Barbara Channel is a recognized hotspot for domoic-acid-producing *Pseudo-nitzschia* spp (several species within the genus). Notable events include: (1) a four-year lethal algal bloom in the SCB that ended in June 2025 with potential exacerbation from the January 2025 fires in Los Angeles; (2) a fall-2014 bloom that prompted prolonged California Department of Public Health seafood consumption advisories into early 2015 (Anderson et al. 2016), and (3) a May 2003 *P. australis* outbreak linked to marine mammal mortality, apparently influenced by silicon limitation and a cyclonic eddy in the western Santa Barbara Channel (Anderson et al. 2006). Ongoing weekly monitoring by SCCOOS (since 2008) provides species/toxin data at multiple SCB piers (Howard et al. 2012).

4.1.3.5 Sediment Quality

Sediment quality integrates long-term contaminant exposure because many pollutants attach to fine particles, settle, and persist on the seafloor over years. As a result, sediments provide a historical record of inputs and, when resuspended by storms or currents, can act as a secondary source back to the water column.

The SCB Regional Monitoring Program's 2013 survey reported approximately 94 percent of the seafloor area un-impacted or likely un-impacted, 6 percent possibly impacted, and only 0.2 percent likely impacted; no areas were "highly impacted." Embayments show greater impacts than the open shelf (about 18 percent possibly/likely impacted in 2013), yet conditions have significantly improved since 1998 (Southern California Coastal Water Research Project 2017). Targeted contaminants show similar patterns: copper is highest in marinas (antifouling paints), PAHs are elevated in embayments (runoff/atmospheric deposition), and pyrethroid insecticides are elevated in estuaries and marinas (Dodder et al. 2016). Within the Santa Barbara Channel, spatial patterns mirror the SCB overall, with generally lower concentrations than the Los Angeles region and a declining east-to-west gradient (Dodder et al. 2016).

4.1.4 Biological Resources

4.1.4.1 Climate

The local climate and waters of the Affected Environment, within the Santa Barbara Channel is influenced by both its coastal location and ocean currents. It has a Mediterranean climate characterized by mild, wet winters and warm, dry summers with temperatures typically moderate year-round due to the cooling effect of the Pacific Ocean, averaging 50° to 65° Fahrenheit (F) (10° to 18° Celsius [C]) in the winter and 60° to 75°F (15° to 24°C) in the summer.

Most rainfall occurs during the winter months, with the region receiving an average of 14.8 inches (37.6 centimeters [cm]) of rain annually (National Weather Service 2025). The California Current (which flows southward along the coast) and the California Countercurrent (which flows north along the coast) converge within the Santa Barbara Channel creating a relatively stable temperature in the area. The prevailing winds of the Santa Barbara Channel generally blow from the west to northwest and generally range from 5 to 15 knots (9 to 28 kilometers/hour [km/hr]), although seasonal variation does occur. Ecologically the Santa Barbara Channel sits in a transition zone with cooler, more nutrient-rich waters to its northwest and warmer, more tropical waters to its southeast. This transition zone has resulted in the development of distinctive communities and foraging grounds for its resident and migrating wildlife.

4.1.4.2 Pelagic Habitat

Pelagic habitat refers to the open water habitat from the surface to the lower water column near the seafloor. Pelagic waters are classified by depth zones and include the epipelagic, mesopelagic, and bathypelagic zones. The epipelagic zone is the uppermost region of the water column. Within the epipelagic zone is the euphotic zone where light levels are high enough to support limited primary production in water as deep as 656 ft (200 m) (Eppley 1992). Below this euphotic zone, light levels and consequently photosynthetic primary production is limited or nonexistent. In addition to low light levels, lower depth zones are characterized by increasingly cold temperatures and high pressure as well as low food availability. The bathypelagic zone in particular is a resource-poor habitat. Consequently, predators and scavengers dominate this zone and species have evolved adaptations to the harsh physical and chemical conditions (Miller and Wheeler 2012).

4.1.4.3 Subtidal Benthic Habitats

Both soft and hard bottom habitats may be found in subtidal areas of the Affected Environment. Subtidal soft sediments of the Santa Barbara Channel are primarily sandy sediments with more silty sediments in deeper waters. There have been multiple comprehensive surveys of subtidal soft sediments in the Santa Barbara Channel (Blake and Lissner 1993; Gillett et al. 2020). The subtidal hardbottom habitat of the Santa Barbara Channel consists of rocky reefs offshore of the mainland and the Channel Islands, as well as isolated rock outcrops scattered throughout the continental shelf (Blake and Lissner 1993; Pondella et al. 2015); however, there are no rocky outcroppings near Platform Gilda.

4.1.4.4 Marine Flora and Fauna

The following sections provide an overview of the habitats and species that are likely to occur within the Affected Environment.

Plankton

Pelagic communities are dominated by plankton, which are defined as organisms that are primarily carried by currents with limited or no swimming ability (Eppley 1992). Plankton includes a diverse array of organisms broken into two main categories, phytoplankton or plant-like plankton, and zooplankton, or animal-like plankton. Phytoplankton are photosynthetic organisms, which form the base of the ocean food web and generate about 50 to 80 percent of the oxygen in Earth's atmosphere through photosynthesis (National Ocean Service 2024).

Zooplankton represent the trophic level above phytoplankton and perform the vital function of transferring energy, in a trophic sense, from phytoplankton to higher forms of marine life in the food chain (Lalli and Parsons 1997). Many federally and California-managed species, including those afforded state and federal protections (e.g., black abalone, sunflower sea star, California spiny lobster, and commercially fished species like rockfish), undergo a planktonic larval phase as part of their early life history. The zooplankton communities include the permanent members (holoplankton), such as chaetognaths, copepods, euphausiids, and larvaceans, and temporary members (meroplankton) such as hydromedusae, fish eggs and larvae, and also the larvae of many invertebrates that spend only a portion of their life cycle as plankton.

Invertebrates

Invertebrates within the Santa Barbara Channel may be classified broadly into pelagic and demersal assemblages. Pelagic assemblages are largely planktonic and are therefore dictated by the physical oceanographic qualities of the Santa Barbara Channel including current direction and water temperature. Depending on the season pelagic invertebrates could include zooplankton (discussed above), krill, squids, tunicates, sea jellies, or crabs. The dominant infauna across most depth zones, including sediments around oil and gas platforms, are amphipods, polychaetes, echinoderms, and bivalves (Gillett et al. 2020). The most abundant epifauna on sandy substrates were shrimp, echinoderms, octopods, and cnidarians. A variety of crab species, including the commercially important rock crabs (*Cancer* spp.) are also present around oil and gas platforms (Carroll and Winn 1989).

Pacific Fishery Management Plan - Managed Invertebrates

Both krill and market squid are federally managed under the Coastal Pelagic Species Fishery Management Plan (FMP) implemented by the Pacific Fishery Management Council (PFMC). Krill serve as a critical trophic link in the Santa Barbara Channel, transferring energy from primary production to higher trophic levels. Among the krill assemblage, *Euphausia pacifica* and *Thysanoessa spinifera* dominate in terms of biomass and ecological importance, supporting predators such as fishes, seabirds, and baleen whales (Abraham and Sydeman 2006). *E. pacifica* is most abundant offshore along the continental shelf break and slope, whereas *T. spinifera* primarily inhabits waters over the continental shelf. Essential fish habitat (EFH) for all species of krill extends the length of the West Coast from the shoreline seaward to the 6,000 ft (1,829 m) isobath and from the surface to a depth of 1,312 ft (400 m) (Pacific Fishery Management Council 2024a). There are no designated Habitat Areas of Particular Concern (HAPC) for krill within the Santa Barbara Channel.

Market squid (*Doryteuthis opalescens*), also managed under the Coastal Pelagic Species FMP, are ecologically important both as predators and prey. They primarily consume zooplankton and small fishes, while providing a major food source for larger fishes, seabirds, and marine mammals (Zeidberg et al. 2006). EFH for market squid covers the marine and estuarine waters from the shoreline along the coasts of California offshore to the limits of the California Exclusive Economic Zone and above the thermocline where sea surface temperatures range between 50°F and 78.8°F (10 and 26°C) (Pacific Fishery Management Council 2024a). While the species supports California's largest fishery by tonnage and ex-vessel value since 1993, there are no HAPC designations for market squid within the Santa Barbara Channel.

Special Status Species - Invertebrates

White Abalone (*Haliotis sorenseni*). Following the closure of the fishery in 1996, the white abalone was listed as Endangered in 2001 under the federal ESA (66 FR 29046; May 29, 2001). Critical habitat has not been designated (NMFS 2018). White abalone is a deep-water mollusk, usually found in water depths from 80 to 200 ft (30 to 60 m), but can be found as shallow as 16 ft (5 m). White abalone is often found in open low and high relief rock or boulder habitat that is interspersed with sand channels. Sand channels may be important for the movement and concentration of drift macroalgae and red algae, which white abalone are known to feed (NMFS 2008). Though the Platform and pipeline habitats within the Affected Environment have suitable substrate to host white abalone, no biological survey to date has observed the species at Platform Gilda (Love et al. 2019) and there are few surveys of abalone associated with oil and gas infrastructure (BOEM 2023b). White abalone are reported to feed less on drift algae and more on attached brown algae, which is notably lacking on the Platforms or pipelines (Hobday and Tegner 2000). This is partially due to a lack of light levels and substrate availability for brown algae on the majority of the Platform structure and pipelines as well as routine cleaning of the upper 60 ft (1 8m) of the Platform structure which regularly displaced any potential food source for white abalone.

Black Abalone (*Haliotis cracherodii*). The black abalone was listed as Endangered under the ESA on January 14, 2009 (74 FR 1937), and critical habitat was designated by NMFS on November 28, 2011 (76 FR 66806). Although critical habitat does not occur within the action area, critical habitat has been designated to the north and south of it (NMFS 2011). Black abalone distribution ranges from approximately Point Arena, Mendocino County, California, south to Bahia Tortugas and Isla Guadalupe in Mexico (VanBlaricom et al. 2009). The majority of black abalone live on rocky substrates in the high to low intertidal zone, and they are rarely found deeper than 6 m of water (VanBlaricom et al. 2009). This species primarily feeds on algae, is long-lived (up to 30 years), and possesses a planktonic larval stage of 4–10 days before settling on benthic habitat (VanBlaricom et al. 2009). The greatest threats to the black abalone include suboptimal water temperatures, low density, disease, and illegal take (Neuman et al. 2010).

Sunflower Sea Star (*Pycnopodia helianthoides*). The sunflower sea star is proposed for listing under the ESA as Threatened (88 FR 16212; March 16, 2023). Critical Habitat has not been designated. The species displays a diverse array of colors, including purple, pink, orange, brown, yellow, and red. Sunflower stars are omnivorous and opportunistic feeders, primarily preying on bivalves such as clams and oysters, as well as sea urchins and other invertebrates (Tolimieri 2023). Sunflower sea stars reproduce sexually through broadcast spawning, releasing gametes into the water collum for external fertilization, typically during May through June.

Fertilized eggs develop into swimming larvae which spend two to ten weeks as plankton before settling down into juvenile benthic sea stars (Hodin et al. 2021). Current populations are mostly limited to the northern parts of their former range including Alaska and British Columbia, but historically they were common from Baja California to Alaska. Current and historical data collected within the SCB has found that, historically, sunflower sea stars occurred in low densities but are now absent from the Southern California Oil and Gas Planning Area (BOEM 2023b). As a habitat generalist, sunflower stars inhabit a variety of marine environments, including kelp forests, rocky reefs, and sandy bottoms, usually at depths ranging from the intertidal zone to 656 ft (200 m) (Tolimieri 2023). Juvenile individuals most commonly occur in the intertidal zone, while reproductive individuals inhabit subtidal zones. Though the Platform habitat within the Affected Environment has suitable substrate to host sunflower sea star, no biological survey to date has observed the species (Love et al. 2019).

Fishes

Platform Gilda is located south of Point Conception, a highly productive transition zone between the Oregonian and Californian (or San Diegan) biogeographic provinces for many marine species, including fishes (Allen et al. 2006; Burton 1998; Miller 2023), and is characterized by rich biodiversity. The natural habitats potentially affected by the proposed Project are the water column and nearby soft sediments (e.g., sand and mud), Allen et al. (2006) describe fish communities associated with soft sediment and water column habitats within California waters. The anthropogenic habitats (platform jacket, marine debris, and associated shell mound) associated with the proposed Project host substantial biomass and marine biodiversity within the Project area. Resident fish populations that live on or near these platforms are dominated by juvenile rockfishes (*Sebastes* spp.), and other reef fishes (Love et al. 2003; Meyer-Gutbrod et al. 2019; Meyer-Gutbrod et al. 2020). The Santa Barbara Channel is part of a larger, highly productive SCB ecosystem that integrates coastal watersheds, kelp forests, rocky reefs, sandy beaches, wetlands, island and shelf habitats, and dynamic oceanographic processes that together support rich biodiversity and interconnected ecological communities (Dailey et al. 1993)

<u>Special Status Species - Fishes</u>

Two of the marine fishes that may occur within the eastern Santa Barbara Channel region are listed as Endangered under the ESA: the Southern California Distinct Population Segment (DPS) of West Coast steelhead and the tidewater goby. The Southern California DPS of West Coast steelhead (*Oncorhynchus mykiss*) comprises the anadromous component of the native *O. mykiss* complex of populations inhabiting coastal streams from the Santa Maria River watershed (Santa Barbara County) south to the U.S. border with Mexico (Busby et al. 1996; NMFS 2012; 2023). Critical habitat for this steelhead DPS was initially designated on September 2, 2005 (70 FR 52488), and includes many river reaches and estuarine areas accessible to listed steelhead in coastal river basins from the Santa Maria Basin to San Mateo Creek (Orange and San Diego Counties. Winter steelhead enter their home streams from November to April to spawn, and juveniles migrate to sea usually in spring (Busby et al. 1996; NMFS 2012; 2023). Steelhead can migrate extensively at sea (Myers 2018).

The tidewater goby (*Eucyclogobius newberryi*) ranges from Del Norte County (near the Oregon border) south to Agua Hedionda Lagoon in northern San Diego County, and 44 units within this range were included in the final critical habitat designation (73 FR 5920). Primary tidewater goby habitat is found in small, shallow coastal lagoons that are separated from the ocean most of the year by beach barriers. These fish typically found in water less than 3.3 ft (1 m) deep (FWS 2005). This includes shallow areas of bays and areas near stream mouths in uppermost brackish portions of larger bays. Tidewater gobies are absent from areas where the coastline is steep, and streams do not form lagoons or estuaries. Although tidewater gobies can tolerate full seawater, they are most common in waters with salinities of less than 12 parts per thousand. Adults are benthic, and larvae are briefly pelagic (FWS 2005).

The following fish species are listed as either threatened or endangered under the ESA, but are unlikely to be found within the Project action area because (1) they are extremely rare or not known to occur in the eastern Santa Barbara Channel region, and (2) the Project action area is small and the habitats contained therein are not especially preferred by the listed species, so they are not further discussed: Chinook salmon (*Oncorhynchus tshawytscha*, Sacramento River winter-run evolutionary significant unit [ESU], Upper Columbia River spring-run ESU, California coastal ESU, Central Valley spring-run ESU, Lower Columbia River ESU, Puget Sound ESU, Snake River fall-run ESU, Snake River spring/summer-run ESU, Upper Willamette River ESU), chum salmon (*Oncorhynchus keta*, Columbia River ESU, Hood Canal summer-run ESU), Coho salmon (*Oncorhynchus kisutch*, Central California Coast ESU, Lower Columbia River ESU, Oregon coast ESU, Southern Oregon & Northern California coasts ESU), steelhead (*Oncorhynchus mykiss*, California Central Valley DPS, Central California Coast DPS, Lower Columbia River DPS, Middle Columbia River DPS, Northern California DPS, Puget Sound DPS, Snake River DPS, South-Central California Coast DPS, Upper Columbia River DPS, Upper Willamette River DPS), eulachon (*Thaleichthys pacificus*, Southern DPS), green sturgeon (*Acipenser medirostris*, Southern DPS), oceanic whitetip shark (*Carcharhinus longimanus*), scalloped hammerhead shark *(Sphyrna lewini*, Eastern Pacific DPS), and giant manta ray (*Mobula birostris*).

Pacific Fishery Management Plan (FMP) – Essential Fish Habitat (EFH) of Managed Fish

The PFMC manages commercial, recreational, and tribal fisheries within Federal waters of Washington, Oregon, and California under four FMPs: 1) Pacific Coast Groundfish FMP; 2) Pacific Salmon FMP; 3) Coastal Pelagic Species (CPS) FMP; and 4) Highly Migratory Species FMP (Pacific Fishery Management Council 2024a; 2024b; 2024c; 2025).

The Project area falls within EFH designations for Groundfish, CPS, and Highly Migratory Species (HMS), though no HAPCs occur at or near Platform Gilda. Groundfish EFH encompasses all waters and substrates from the shoreline to depths of 3,500 m (11,482 ft), which includes the platform's 205-ft (62.4 m) water depth and the surrounding soft-bottom, pelagic, and artificial-reef habitats. CPS EFH covers the entire water column above the thermocline throughout the California Exclusive Economic Zone, and krill EFH extends from the shoreline to the 6,000-ft (1,828 m) isobath, fully including the Santa Barbara Channel. HMS EFH encompasses all offshore waters of Southern California used by tunas, sharks, and billfish. Pacific salmon EFH technically spans marine waters north of Point Conception but does not include the Platform Gilda area; therefore, salmon EFH is absent. Overall, the platform is situated within a biologically productive EFH mosaic supporting pelagic foraging, migratory pathways, and demersal habitat use by multiple federally managed species.

Marine Turtles

Three species of protected marine turtles could occur within the Affected Environment: loggerhead turtle (*Caretta caretta*), leatherback turtle (*Dermochelys coriacea*), and green turtle (*Chelonia mydas*). Olive ridley (*Lepidochelys olivacea)* and hawksbill (*Eretmochelys imbricata)* turtles are rarely observed within the Santa Barbara Channel (California Herps 2026). Sea turtles observed within the Santa Barbara Channel are typically transient individuals whose occurrence reflects oceanographic and ecological conditions rather than the presence of resident populations. The Santa Barbara Channel is strongly influenced by seasonal upwelling and the northward transport of warm surface waters associated with the California Current and episodic El Niño events. These oceanographic features can entrain turtles, particularly juvenile and subadult individuals, into nearshore waters outside of their typical range. Turtles are generally encountered when anomalously warm-water masses extend into the SCB, providing conditions suitable for their survival.

No sea turtle species nest in California. However, floating kelp mats, jellyfish aggregations, and pelagic red crabs, which periodically occur in the Santa Barbara Channel, represent important prey resources that attract turtles during favorable conditions. Additionally, the Santa Barbara Channel is a migratory corridor linking tropical and subtropical developmental habitats with more northerly foraging areas. Consequently, turtle presence in the Santa Barbara Channel is sporadic, and strongly tied to warm-water intrusions and associated prey availability.

Marine Birds

The Pacific Flyway is a major migratory route for all bird species that travel from the Northwestern U.S., Canada, and Alaska to Southern California and Central and South America. A portion of the Pacific Flyway is located off the coast of California, but the exact location of migratory routes can vary depending on the weather. Migratory seabirds tend to fly at elevations between several hundred to several thousand feet above the ocean; however, weather conditions, such as wind and fog, influence flight altitude (Ainley et al. 2015). The Santa Barbara Channel and its associated coastlines are used by as many as 195 bird species for various purposes, including breeding, feeding, as non-breeding summer residents, winter residents or migrants (Baird 1993). Because of species diversity in Central and Southern California, the timing of seasonal migrations can vary; however, most southward migration to wintering areas occurs from late September to late December. The fall migration generally occurs over a longer period compared to the spring migration, presumably because of variability in species egg incubation, nesting, and fledging times. Spring migration normally occurs from February through the beginning of June, and the fall migration route of coastal seabirds is usually further offshore than that used by the spring migrants. Annual and seasonal variation in the number of migrants is further correlated to the sea surface temperature (Spear and Ainley 1999).

Breeding species within the Affected Environment are those that nest on the Channel Islands and along the mainland of the Santa Barbara Channel. Though offshore oil platforms provide roosting habitat for seabirds, no nesting sites have been recorded on Platform Gilda. Most of the seabirds that nest in southern California occur within the Channel Islands National Park, which provides a high level of protection to breeding birds (Aspen Environmental Group 2005). Although breeding phenology varies from species to species, one or more species is generally conducting some aspect of reproduction (i.e., nest building, egg laying, or chick rearing) from April through August annually within the Channel.

Bird species occurring offshore in the Santa Barbara Channel may be afforded protection under federal law. At the federal level, the Migratory Bird Treaty Act prohibits the unauthorized take of migratory birds, their nests, and eggs, while the ESA provides additional protection for species federally listed as endangered or threatened. Listed species that may occur in the Affected Environment include the California least tern (*Sternula antillarum browni*), marbled murrelet (*Brachyramphus marmoratus*), and short-tailed albatross (*Phoebastria albatrus).* Also, the FWS identifies Birds of Conservation Concern to prioritize proactive management and conservation efforts. Together, these overlapping protections ensure varying degrees of legal and conservation status for bird species that use the offshore habitats of the Santa Barbara Channel.

Marine Mammals

Because of its unique oceanographic setting, the Santa Barbara Channel is recognized as one of the most important marine mammal habitats along the U.S. West Coast. The confluence of the California Current, strong seasonal upwelling, and complex bathymetry create highly productive foraging grounds that support an exceptional diversity and abundance of cetaceans and pinnipeds, including both migratory and resident species. Reflecting this ecological significance, the region has been designated a Whale Heritage Area, a recognition that carries no legal protections but emphasizes the Santa Barbara Channel's global biological importance for marine mammals, including its role in important feeding, breeding, and migratory behaviors. For a list of the marine mammal populations with potential to occur within the Affected Environment, see **Table 4.1-5** and **Table 4.1-6**.

<u>Pinniped Haul-Outs and Rookeries</u>

California sea lions frequently use platform loading decks as haul-outs, including those within the Santa Barbara Channel (Orr et al. 2016). California sea lions, Pacific harbor seals, northern elephant seals and northern fur seals are known to breed on the Channel Islands, primarily San Miguel Island which is located approximately 50 mi (80.4 km) from Platform Gilda. In addition, there is a Pacific harbor seal rookery adjacent to the Casitas Pier, Carpinteria, California. This rookery is known to host approximately 100 to 170 seals annually and is located approximately 14.5 mi (23.3 km) north of Platform Gilda (Carpinteria Seal Watch 2025). Anacapa Island, approximately 11 mi (17.7 km) south of Platform Gilda hosts several Pacific harbor seal haul-outs and California sea lion rookeries.

Special Status Species – Marine Mammals

Marine mammals occurring within the Santa Barbara Channel are protected under a combination of federal and state regulations as well as spatial conservation designations. The Marine Mammal Protection Act (MMPA) prohibits the harassment, hunting, capture, or killing of all marine mammals in U.S. waters without authorization, providing broad baseline protection. Additional safeguards are conferred under the ESA for species formally listed as Endangered or Threatened, while California state law provides parallel protection for species listed under the California Endangered Species Act for species designated as threatened or endangered, as well as through special classifications including California Fully Protected species, and California Species of Special Concern.

Beyond statutory protections, the National Oceanic and Atmospheric Administration (NOAA) has designated Biologically Important Areas to highlight regions of particular significance to marine mammals for feeding, breeding, or migratory behaviors, thereby identifying habitats of elevated conservation concern. Collectively, these protections govern the management and conservation of marine mammals in the region.

4.1.4.5 Marine Protected Areas and National Marine Sanctuaries

California Department of Fish and Wildlife (CDFW) Code Section 2853 establishes Marine Protected Areas (MPAs) to improve recreational, educational, and study opportunities provided by marine ecosystems that are subject to minimal human disturbance, and to manage these uses in a manner consistent with protecting biodiversity. The Anacapa Island State Marine Reserve (SMR) and Anacapa Island State Marine Conservation Area (SMCA) are both approximately 7 mi (11.3 km) from the Program area. Anacapa SMR is one of the most restricted MPAs in the region and prohibits all fishing and collecting. Anacapa SMCA prohibits most collections and fishing but does allow take for lobster (commercial and recreational during the open season), and pelagic finfish. Combined, both MPAs encompass the entire northern coastline of Anacapa Island and make up 18.85 square miles (mi^2) (48.12 square kilometers [km^2]) of protected ocean.

National Marine Sanctuaries, managed by NOAA under the National Marine Sanctuaries Act, provides a suite of protections designed to conserve ecological, cultural, and historical resources within their boundaries. Within the Affected Environment of the Santa Barbara Channel there are two National Marine Sanctuaries. The Channel Islands National Marine Sanctuary is a protected area surrounding the northern four islands of Channel Islands National Park, encompassing approximately 1,470 mi^2 (3,807.3 km^2) of ocean. The Chumash Heritage National Marine Sanctuary is located offshore of California’s central coast, encompassing waters and submerged lands from just south of the Diablo Canyon Power Plant in San Luis Obispo County down to Naples Reef along the Gaviota Coast in Santa Barbara County, encompassing approximately 4,543 mi^2 (11,766 km^2), it extends roughly 60 mi (96.6 km) seaward and spans 116 mi (186.7 km) of coastline. Affected Environment does not overlap with any state MPAs or federal sanctuaries.

Table 4.1-5. Marine Mammal Populations with Potential to Occur within the Affected Environment - Mysticetes

Common Name ***Scientific Name***	**Status[1]**	**Stock Designation**
Blue whale *Balaenoptera musculus*	FE	Eastern North Pacific Stock
California gray whale *Eschrichtius robustus*	FE	Western North Pacific Stock
California gray whale *Eschrichtius robustus*	MMPA	Eastern North Pacific Stock
Fin whale *Balaenoptera physalus*	FE	California/Oregon/Washington Stock
Humpback whale *Megaptera novaeangliae*	FT	Mainland Mexico - California/Oregon/Washington Stock
Humpback whale *Megaptera novaeangliae*	FE	Central American/ Southern Mexico – California/Oregon/Washington Stock
Minke whale *Balaenoptera acutorostrata*	MMPA	California/Oregon/Washington Stock
North Pacific right whale *Eubalaena japonica*	FE, CFP	Eastern North Pacific
Sei whale *Balaenoptera borealis*	FE	Eastern North Pacific Stock
Baird's beaked whale *Berardius bairdii*	MMPA	California/Oregon/Washington Stock
Common bottlenose dolphin *Tursiops truncatus*	MMPA	California/Oregon/Washington Offshore Stock
Common bottlenose dolphin *Tursiops truncatus*	MMPA	California Coastal Stock
Cuvier's beaked whale *Ziphius cavirostris*	MMPA	California/Oregon/Washington Stock
Dall's porpoise *Phocoenoides dalli dalli*	MMPA	California/Oregon/Washington Stock
Dwarf sperm whale *Kogia sima*	MMPA	California/Oregon/Washington Stock
Killer whale *Orcinus orca*	MMPA	Eastern North Pacific Offshore Stock
Killer whale *Orcinus orca*	MMPA	West Coast Transient Stock
Long-beaked common dolphin *Delphinus delphis bairdii*	MMPA	California Stock
Mesoplodont beaked whales	MMPA	California/Oregon/Washington Stocks
Northern right whale dolphin *Lissodelphis borealis*	MMPA	California/Oregon/Washington Stock
Pacific white-sided dolphin *Lagenorhynchus obliquidens*	MMPA	California/Oregon/Washington Northern and Southern Stocks
Pygmy sperm whale *Kogia breviceps*	MMPA	California/Oregon/Washington Stock
Risso's dolphin *Grampus griseus*	MMPA	California/Oregon/Washington Stock

Common Name *Scientific Name*	Status[1]	Stock Designation
Short-beaked common dolphin *Delphinus delphis delphis*	MMPA	California/Oregon/Washington Stock
Short-finned pilot whale *Globicephala macrorhynchus*	MMPA	California/Oregon/Washington Stock
Sperm whale *Physeter macrocephalus*	FE, MMPA	California/Oregon/Washington Stock
Striped dolphin *Stenella coeruleoalba*	MMPA	California/Oregon/Washington Stock

[1]Status Codes:
FE: Federally listed Endangered Species
FT: Federally listed Threatened Species
CFP: California Fully Protected Species
MMPA: Marine Mammal Protection Act
Source: Carretta et al. (2024)

Table 4.1-6. Marine Mammal Populations with Potential to Occur within the Affected Environment - Pinnipeds

Common Name Scientific Name	Status[1]	Stock Designation
California sea lion *Zalophus californianus*	MMPA	U.S. Stock
Guadalupe fur seal *Arctocephalus townsendi*	FT, MMPA	Entire population
Northern elephant seal *Mirounga angustirostris*	MMPA, CFP	California Breeding Stock
Northern fur seal *Callorhinus ursinus*	MMPA	California Stock
Pacific harbor seal *Phoca vitulina richardii*	MMPA	California Stock
Stellar sea lion *Eumetopias jubatus* Western DPS	FE, MMPA	Western Stock
Stellar sea lion *Eumetopias jubatus* Eastern DPS	MMPA	Eastern Stock

[1]Status Codes:
FE: Federally listed Endangered Species
FT: Federally listed Threatened Species
CFP: California Fully Protected Species
MMPA: Marine Mammal Protection Act
Source: Carretta et al. (2024); Young et al. (2023)

4.1.5 Commercial and Recreational Fishing

The Santa Barbara Channel is located within the northern portion of the SCB and is a transition zone between the cool California current and the warmer Southern California countercurrent (NOAA 2008). Due to this confluence of cool and warm waters and subsequent major upwelling of nutrient-rich waters, the Channel supports productive commercial and recreational fisheries. However, as ocean conditions, such as temperature, nutrients, and habitat availability constantly shift, species composition within the Santa Barbara Channel is highly variable (NOAA 2008).

4.1.5.1 Commercial Fishing

The Santa Barbara Channel supports a diverse range of biogeographic conditions that have fostered the development of a substantial commercial fishing industry. This region, designated as the Santa Barbara Port Area (SBPA), encompasses four primary commercial ports: Santa Barbara Harbor, Ventura Harbor, Oxnard/Channel Islands Harbor, and Port Hueneme. Each port differs in size, dominant fisheries, and the extent of infrastructure available to support commercial fishing operations. (Culver et al. 2007). Together, these ports have made the SBPA an important center for California's commercial fisheries economy. In 2024, the SBPA ranked first out of all California's port areas for annual landings value at $65 million making up 34.3 percent of all landings value in California (California Department of Fish and Wildlife 2026).

CDFW manages a fisheries data collection system by partitioning the ocean waters of the state into sections called "fish blocks." Each fish block is approximately ten minutes of latitude by ten minutes of longitude, or approximately 100 nm^2; however, they can be smaller if land is located within the block. These fish blocks are used to describe the primary location of where a catch is harvested on a landing receipt. Landings receipts are created in the Marine Fisheries Data Explorer (MFDE), allowing the public to access reviewed and summarized California commercial landings data. The MFDE was used in this study to assess commercial fishing activity within the Program region. It should be noted that certain commercial fish landing data provided by the CDFW are labeled as "Confidential" in accordance with state and federal regulations designed to protect proprietary information. This confidentiality safeguard is intended to prevent the identification of individual fishers or operations, thereby protecting commercially sensitive information such as fishing locations, effort, and harvest volumes (California Department of Fish and Wildlife 2026).

The Program area is located in Fish Block 665 off the coast of Ventura County. A portion of the block is inaccessible to fishing activities due to the coastline overlapping this area. Over half of the water within the fish block is federal waters while a small portion remains within state waters. However, there is no commercial fishing on vessels exceeding 100 ft (30 m) allowed within 1,640 ft (500 m) of the Platform structure's outer edge due to 33 CFR 147.1102 which requires a safety zone around the radius of the Platform. **Table 4.1-7** provides a summary of cumulative commercial landings in Fish Block 665 from 2015–2024.

Table 4.1-7. Cumulative Commercial Landings in Fish Block 665 2015–2024

Gear Type	Species Group	Pounds	Value $	Pounds %	Value %
Traps	Total	978,650	5,193,805	20	44
Traps	Crabs	763,809	1,387,907	16	12
Traps	Lobster	201,856	3,757,988	4	32
Traps	Mollusks	5,403	4,979	<1	<1
Traps	Roundfish	1,513	6,092	<1	<1
Traps	Sharks	1,148	1,662	<1	<
Traps	Shrimp/prawn	2,090	29,163	<1	<1%
Traps	Confidential	2,831	6,014	<1	<1
Gillnet	Total	812,097	3,112,160	16	26
Gillnet	Crabs	28,379	25,728	<1	<1
Gillnet	Flatfish	305,578	1,507,382	6	13
Gillnet	Roundfish	349,000	1,398,586	7	12
Gillnet	Sharks	123,246	178,639	2	1
Gillnet	Skates & Rays	5,675	912	<1	<1
Gillnet	Confidential	219	913	<1	<1
Trawl	Total	840,372	2,422,069	17	20
Trawl	Crabs	34,359	53,905	<1	<1
Trawl	Flatfish	196,999	859,844	4	7
Trawl	Mollusks	329	520	<1	<1
Trawl	Rockfish	533	972	<1	<1
Trawl	Roundfish	82,877	62,981	2	<1
Trawl	Sea Cucumber	12,176	38,362	<1	<1
Trawl	Sharks	12,782	19,417	<1	<1
Trawl	Shrimp/Prawn	475,047	1,366,660	10	12
Trawl	Skates & Rays	13,362	8,889	<1	<1
Trawl	Confidential	11,908	10,519	<1	<1
Seine	Total	2,266,194	1,074,267	46	9
Seine	Roundfish	616,546	189,322	12.5	1
Seine	Squid	1,649,648	884,945	33.5	7
Hook-and-Line	Total	14,407	66,024	<1	<1
Hook-and-Line	Flatfish	4,227	23,675	<1	<1
Hook-and-Line	Rockfish	1,471	5,642	<1	<1
Hook-and-Line	Roundfish	7,605	30,309	<1	<1
Hook-and-Line	Sharks	169	154	<1	<1
Hook-and-Line	Confidential	935	6,244	<1	<1
Dive	Total	10,643	18,565	<1	<1
Dive	Sea Urchin	9,571	15,963	<1	<1
Dive	Confidential	1,072	2,602	<1	<1

Gear Type	Species Group	Pounds	Value $	Pounds %	Value %
Confidential	Deep-set Buoy Gear Harpoon/Spear Set Longline	1,641	9,611	<1	<1
Total		4,924,004	$11,896,501	100%	100 %

As shown in **Table 4.1-7**, a total of approximately 4,924,004 lbs. were reported from 2015-2024, at a value of $11,896,501 within Fish Block 665. Trap fisheries were valued at $5,193,805 within the 10-year period, accounting for 44 percent of overall landings value and making it the most lucrative fishery in Fish Block 665. The California spiny lobster trap fishery contributed 32 percent to the overall fish block value with $3,757,988, making it the most valuable species during this period. The gillnet fishery was valued at $3,112,160 and ranked second for contributing 26 percent of total fish block value. White seabass (roundfish) and California halibut (flatfish) accounted for the majority of landings within the gillnet fishery. The trawl fishery brought in 20 percent of total fish block value, with ridgeback prawn and California halibut as leading species. The seine fishery accounted for nearly half of total fish block weight, the most of any other fishery, accounting for 46 percent with 2,266,194 lbs; the majority coming from market squid. The hook-and-line, dive fisheries, and all confidential fisheries data reported weights and values contributing less than 1 percent to overall fish block landings.

4.1.5.2 Recreational Fishing

Recreational fishing in the Santa Barbara Channel is supported by diverse fishing methods, across many access points. Anglers commonly fish from shorelines, jetties, and piers, but the most productive methods are boat-based, including private vessels, rental boats, and commercial passenger fishing vessels (CPFV). These modes allow access to the Santa Barbara Channel's offshore reefs, kelp forests, and island waters, where a range of species are targeted. CPFVs typically operate full- or half-day trips and employ hook-and-line or drift fishing techniques, while private boat anglers often troll, bottom fish, or use live bait depending on target species and season.

Common target species in the Southern California region include various bottomfish, such as rockfish, ocean whitefish, lingcod, basses, and California scorpionfish. Coastal migratory species include yellowtail, Pacific barracuda, Pacific bonito, and Pacific mackerel. Highly migratory species include yellowfin tuna, Pacific bluefin tuna, mahi-mahi, albacore tuna, skipjack tuna, thresher shark, and wahoo (Pacific Fishery Management Council 2022). California halibut also represents an important component to Southern California's recreational fishery. Peak recreational fishing season for this region is May through September (Pacific Fishery Management Council 2022). Offshore recreational fishing in waters greater than three miles from shore during the 2017 through 2021 period indicates that fishing trips along the California coast primarily targeted bottomfish species with 62 percent of recreational landings by weight, followed by coastal migratory species with 18 percent of recreational landings by weight, and finally highly migratory pelagic species also with 18 percent of recreational landings by weight.

Recreational fishing offshore of Santa Barbara and Ventura Counties, takes place mainly in state waters rather than federal waters. For instance, from 2023–2024, the Pacific Coast Recreational Fisheries Information Network (RecFIN) reported approximately 155 metric tons (MT) of catch within Santa Barbara and Ventura Counties in federal waters (RecFIN 2025). Bottomfish made up approximately 99 percent of that total weighted catch, with over half of bottomfish species being rockfish. Highly migratory species accounted for less than 1 percent of total catch within the Santa Barbara Channel region during 2023–2024 with 0.632 MT. Coastal migratory contributed the least to total catch within the given parameters with only 0.152 MT in catch. In contrast, total catch within state waters was reported as approximately 425 MT.

4.1.5.3 Aquaculture

Aquaculture is a key agricultural sector and one of the fastest growing forms of food production in the world. Aquaculture is defined as the propagation, rearing, and harvesting of aquatic organisms in a controlled or selected environment for any commercial, recreational, or public purpose. Reef-safe, low-trophic aquaculture is already established in the Santa Barbara Channel and poised to expand. In state waters off Santa Barbara, Santa Barbara Mariculture operates an approximately 73-acre longline shellfish lease (mussels/oysters); since 2021, research-only kelp cultivation by the University of California at Santa Barbara and a seaweed company has also been authorized inside that lease via a California Coastal Commission amendment.

There are no aquaculture sites located near Platform Gilda; however, in federal waters, the Ventura Shellfish Enterprise has pursued pre-permitting of multiple 100-acre mussel plots. In parallel, NOAA has identified Aquaculture Opportunity Areas (AOAs) (eight candidate sites) to focus environmental analysis and streamline site selection in federal waters. These efforts reflect the Santa Barbara Channel’s favorable oceanography (productive upwelling, strong flow, and deep, unobstructed sites) and working-waterfront infrastructure in Santa Barbara and Ventura Harbors. In addition, a commercial-scale kelp aquaculture project in federal waters now under USACE review (Public Notice SPL-2022-00738-LPF). The application describes a 2,000-acre *Macrocystis* farm centered at 34.249, −119.4085, about 6.3 nautical miles (7.3 miles) from Ventura Harbor, within NOAA AOA option N2-D. The chosen site lies approximately four miles from Platform Gilda. The design uses anchored “backbone” lines with subsurface grow lines held between 15 to 30 ft (4.5 to 9 m) below the surface.

4.1.6 Recreation and Tourism

The Santa Barbara Channel and its coastline are recreation and tourism destinations in Southern California. Several parks, reserves, marine sanctuaries, and MPAs are frequented by visitors and residents alike, offering a unique outdoor experience in its exceptional natural landscape. Common recreational activities in the coastal zone include beach recreation, surfing, sightseeing, and kayaking. Offshore activities within the Santa Barbara Channel also include whale watching, diving, sailing, and fishing. Though transit and recreational activities are prohibited within 500 m (1,640.4 ft) of the Platforms to all vessels greater than 100 ft in length, smaller vessels are allowed to recreate within the USCG regulated “safety zone”.

4.1.6.1 Onshore

Channel Islands National Park

Located just 6.0 mi (9.6 km) south of the Program area, Channel Islands National Park reported 281,232 visitors in 2024 (NPS 2026). Visitors can enjoy hiking scenic trails, wildlife watching (with opportunities to see seals, sea lions, and the endangered island fox), kayaking and canoeing around coastal cliffs and sea caves, and snorkeling or scuba diving in rich marine ecosystems. Other recreational activities include boating, fishing, camping at several island campgrounds, and ranger-led tours to learn about its natural and cultural history. Travel to and from the National Park typically uses specific routes, which, when transiting to Anacapa or Santa Cruz Island, would pass within eyesight of Platform Gilda.

Parks and Recreation Areas

Public beach access along the eastern Santa Barbara Channel is plentiful with state and local beaches making up much of the coastline from Oxnard to Carpinteria. Some of the larger or more popular beaches include Oxnard State Beach Park, Harbor Cove Beach and Marina Park, San Buenaventura State Beach, Rincon Point Beach, and Carpinteria State Beach. Coastline parks provide a broad range of recreational activities from beach access and surfing to hiking and camping. Program activities will not directly impact access to coastline parks or coastal recreational activities.

Ports and Harbors

The ports and harbors in the Santa Barbara Channel are vital hubs for a wide range of recreational activities, supporting both visitors and residents. Santa Barbara Harbor, Ventura Harbor, and Oxnard Harbor are popular for activities such as recreational boating, fishing, kayaking, paddleboarding, and sightseeing. Santa Barbara Harbor contains approximately 1,143 slips. Ventura Harbor supports several marinas, and collectively the harbor provides roughly 1,500 to 1,600 boat slips. Channel Islands Harbor in Oxnard is the largest in the region, with approximately 2,150 slips distributed among multiple public and private marinas. These ports are common starting points for all the recreational and commercial activities which use the Santa Barbara Channel. Program vessels would use the existing transit routes to and from regional ports including Santa Barbara Harbor, Port Hueneme, and Port of Long Beach, depending on where equipment would be mobilized.

4.1.6.2 Offshore

Whale Watching

Whale watching in the Santa Barbara Channel offers incredible opportunities to see migrating whales, including gray, humpback, and blue, along with dolphins, sea lions, and other marine life. Whale watching is possible year-round with gray whale migration from December to April, and larger species like blue and fin whales present during the warmer water months of late summer and early fall. Whale-watching tours typically depart from harbors in Santa Barbara, Ventura, and Oxnard. Popular charter operators in the region, including Condor Express, Island Packers, and Santa Barbara Whale Watch, provide whale-watching trips on a near-daily basis for most of the year, with service frequencies increasing to two trips per day (per company) during the peak spring season. Whale-watching boats in the Santa Barbara Channel are typically less than 100 ft in length. Whale watching around oil and gas platforms is often popular because they act as aggregators for schooling prey fish that are often targeted by cetaceans and pinnipeds.

Diving

Diving is a popular activity in the Santa Barbara Channel and several commercial dive boats are available for charter out of both Ventura and Santa Barbara harbors. The Channel Islands, particularly Santa Cruz and Anacapa Islands, are notable dive sites for their clear waters and rich biodiversity. SCUBA diving on oil and gas platforms, whether from a boat or from the platform, must be done with explicit permission and is typically only done for scientific purposes.

Fishing

Recreational fishing in the Santa Barbara Channel is popular due to its rich marine life; anglers target species such as kelp bass, halibut, rockfish, and white sea bass. Fishing around oil and gas platforms is a notable activity within the Program area. Platforms attract a wide variety of fish due to their structure, which provides a habitat for marine life.

Sailing and Recreational Boating

Recreational sailing and boating in the Santa Barbara Channel are popular activities, with its favorable winds and access to the Channel Islands. Sailboats, yachts, and powerboats frequently depart from the recreational harbors of Santa Barbara, Ventura, and Oxnard.

4.1.7 Socioeconomics

Program vessel contractors and crews would be based from the local workforce in Santa Barbara, Ventura, and Los Angeles Counties. Program activities would create local but temporary job opportunities for marine contractors and specialized labor force. Program crews would reside on the Platform during each campaign and would not require housing or related services onshore.

In southern California, ocean industry employment is primarily focused within the tourism and recreation, and marine transportation sectors. Tourism and recreation are higher in Los Angeles, Orange, and San Diego Counties, and marine transportation is highest in Los Angeles County (National Ocean Economics Program 2025).

4.2 ENVIRONMENTAL CONSEQUENCES OF THE PROPOSED ACTION

4.2.1 Geology and Seismicity

This section evaluates the potential effects of the proposed well stimulation program on geologic conditions and seafloor resources. As described in **Section 4.1.1**, Platform Gilda is located on a gently sloping continental shelf underlain by stable sediments, with no mapped submarine landslides or unstable seafloor features in the vicinity. The proposed Program would not create new wellbores in the seafloor and targets already producing deep subsurface formations that are not in proximity to regional fault systems. The proposed Program would be implemented entirely from an existing offshore platform without physical interaction with the seabed.

4.2.1.1 Shallow Hazards

Shallow geologic hazards evaluated for the Program include the potential for hydrocarbon seepage to the seafloor, migration of stimulation fluids outside the target interval, and induced seismicity (i.e., earthquakes created by the act of injecting well stimulation fluid). Each of these potential pathways is constrained by the depth of the target formations, the current geologic conditions, and the manner in which the Program would be implemented.

The proposed stimulation targets are Pliocene-age reservoir intervals within the Repetto Formation of the Santa Clara Field, located thousands of feet below the seafloor and separated from shallow sediments by multiple low-permeability confining units, as described in **Section 4.1.1**. Hydrocarbon accumulation within the Santa Clara Field is controlled by a combination of structural and stratigraphic traps.

Regional studies indicate that natural hydrocarbon seepage in the Santa Barbara Channel is concentrated along the northern margin of the Channel, away from the vicinity of Platform Gilda, and no natural oil or gas seeps or seep-related seafloor features have been documented near the Platform (**Section 4.1.1**). These conditions indicate that shallow migration pathways connecting deep reservoirs to the seafloor are not present in the Program area. In addition, shallow gas accumulations, shallow water flow conditions, and the presence of offshore freshened groundwater aquifers typically associated with unconsolidated sediments, have not been identified in the vicinity of Platform Gilda. The proposed Program does not involve drilling new wells or penetrating shallow formations, and therefore would not encounter or activate shallow gas, shallow water flow hazards, or offshore freshened groundwater.

Many factors control upward migration of stimulation fluids, but the effects of buoyancy are almost always much less than the overcoming effects of imbibition, well suction, and overpressure (Birdsell et al. 2015). Any introduction of stimulation fluid during a treatment would have to fight against these three things to reach the surface: 1) the stimulation fluid would first have to overcome well flowback created when the well is returned to production (i.e., well suction); 2) any remaining stimulation fluid would then have to overcome the effects of imbibition within the existing formation pore water as it migrates upward; and 3) the stimulation fluid would have to break through the shale sealing layers of the Upper Repetto and Pico formations.

As a matter of geometry, induced fractures created at depths less than 1,200 ft (365.7 m) true vertical depth will propagate horizontally; induced fractures at depths greater than 1,200 ft will propagate vertically. All proposed stimulation activities within the Santa Clara field will occur at depths greater than 4,500 ft (1,371 m) and would create vertical fractures. A study conducted in 2012 (Davies et al. 2012) assessed data from thousands of fracking operations in the U.S., Europe, and Africa to analyze upward vertical propagation distances of stimulated fractures. The Davies et al. (2012) study showed the probability of exceeding a >350 m (1,150 ft) stimulation-induced vertical fracture is less than 1 percent. The 2012 report, which is the only known assessment of its' kind, states that in no case has a stimulation-induced fracture propagated more than > 588 m (approx. 1,900 ft). A 1,900 ft vertical distance should therefore be considered a safe separation distance for environmentally safe operations.

The Upper Repetto is known to have multiple sealing shale layers and stimulation fluid leakage out of the formation and into the overlying Pico formation would require some sort of breakthrough of these confining shale layers through a vertical stimulation-induced fracture. The closest shale layer to the Upper Repetto is approximately 250 ft (76.2 m) above the shallowest zone proposed for well stimulation. This confining shale layer is correlated by well log data at around 25 ft in thickness. The proposed well stimulation program within the Upper Repetto will occur between 4,950–5,900 ft (1,508.7–1,798.3 m) in along an average interval of 60 ft. The well stimulation program is designed to create fracture heights between 100–200 ft. (30.48–60.98 m) Based on geometry from the mid-point of the zone, a fracture height of around 725 ft (220 m) would be necessary to break through the upper sealing shale layers. The Davies et al. (2012) study shows the probability of non-exceedance for a top fracture exceeding 200 m (656 ft) is around 5 percent.

The southern boundary of the field is defined by the World's End Reverse Fault system, which acts as a trapping structure at depth for the Upper Repetto Formation. Available geophysical interpretations indicate that the World's End Fault does not exhibit a seafloor surface expression and does not extend upward into shallow sedimentary units or the seabed. In addition to this deep structural trap, lateral thinning and pinch-out of geologic units create stratigraphic traps within the Santa Clara Field. The Lower Repetto reservoir is characterized by a stratigraphic pinch-out and does not rely on faulting for hydrocarbon entrapment. Because hydrocarbon accumulation in the Lower Repetto is not structurally controlled and because the World's End Fault does not provide a vertical migration pathway to the seafloor, there is no mechanism by which stimulation fluids or hydrocarbons could migrate along fault planes to shallow sediments or the seabed. The known sealing behavior of the faults in the Santa Clara Field, along with the distance between fault termination and the seafloor, would be expected to trap stimulation fluids from migrating out of the Upper Repetto.

The proposed stimulation activities would occur entirely within existing wellbores and would not involve drilling new wells or creating new pathways through overlying geologic units. The intensity and duration of the proposed Program further limit the potential for subsurface pressure changes that could otherwise promote fluid migration. The short duration of individual stimulation stages (approximately two hours per stage) and relatively small stimulation treatment volumes (approximately 1,400 barrels of slurry per stage) limit subsurface pressure changes. The total stimulation fluid volume would be approximately 49,400 bbl of flowback fluid, or up to approximately 100,000 bbl over a five-year period.

Considering typical injection volumes as well as water production volumes (refer to **Section 2.5**), there is injection capacity to reinject the stimulation flowback fluid. The size of the proposed injection volumes can be compared to unconventional onshore shale hydraulic fracturing operations, which involve fluid volumes one to two orders of magnitude greater and can inject up to approximately 40 million gallons per well.

Hydraulic fracturing can, in rare cases, induce seismic events (i.e., earthquakes) if performed adjacent to critically stressed faults. In the Santa Barbara Channel, the proposed stimulation intervals are located at considerable distances from mapped Quaternary faults (USGS 2020). Regional faults, such as the Oak Ridge and Mid-Channel Faults, are located more than two miles from Platform Gilda while field-scale level faults, such as the World's End Fault, lies approximately 2,500 ft from the closest planned treatment zone. In addition, the stimulation targets are not structurally connected and fracture distances would not intersect with these faults (fracturing half-length is 150 to 300 ft; fracturing height is 100 to 200 ft). Historical offshore stimulations conducted between 1986 and 2014, including multiple treatments on Platform Gilda, did not trigger detectable seismicity, demonstrating that similar operations under comparable geologic conditions have not produced seismic events (Argonne National Laboratory 2016).

Standard well integrity practices incorporated into the proposed Program, including casing verification, cementing, and pressure testing (see **Section 2.8**), ensure that stimulation pressures are contained within the intended interval and do not compromise overlying formations. Based on the stratigraphic and structural trapping mechanisms, lack of fault connectivity to the seafloor, absence of documented natural seepage near the Platform, limited duration and scale of stimulation activities, and demonstrated operational history at Platform Gilda, the proposed Program would not result in stimulation fluid migration, hydrocarbon seepage to the seafloor, or induced seismicity.

4.2.1.2 Seafloor Disturbance

Potential impacts to seafloor conditions are limited since all stimulation activities would be conducted entirely from the existing Platform Gilda deck and within existing wellbores. The proposed Program would not involve anchoring, trenching, seabed excavation, pile driving, or installation or modification of seafloor infrastructure. No new wells would be drilled, and no activities would require direct contact with the seafloor.

Pipelines associated with Platform Gilda would remain unchanged and would not be accessed, modified, or disturbed as part of the proposed Program. Support vessels would operate in accordance with standard offshore practices and would not deploy anchors or equipment on the seabed. As a result, the proposed activities would have no spatial footprint on the seafloor.

As described in **Sections 4.1.1.3** and **4.1.1.4**, the seafloor underlying and surrounding Platform Gilda consists of gently sloping, sedimentary shelf deposits and lacks steep slopes, scarps, or geomorphic features typically associated with submarine slope instability. No mapped submarine landslide features have been identified in the immediate vicinity of the Platform (Ross et al. 2004). Existing seafloor features, including shell mounds formed from historic Platform operations, would not be altered by the proposed Program.

Because the proposed Program does not involve physical interaction with the seabed and relies entirely on existing platform infrastructure on stable seafloor conditions, it would not result in direct or indirect disturbance to seafloor sediments, bathymetry, shell mounds, or other seafloor features.

4.2.2 Air Quality and Greenhouse Gases

4.2.2.1 Criteria and Precursor Pollutants Emissions

Proposed Program well stimulation activities would generate offshore emissions due to the use of marine vessels and well stimulation equipment. Well stimulation activities are expected to operate temporarily, for approximately 14 days per year, over a five-year period.

Criteria and precursor pollutant emissions for the marine vessel and portable equipment utilized during the well stimulation activities were estimated using established emission factors from the CARB's California Emissions Estimator Model (CalEEMod) User's Guide, Appendix D, Default Data Tables (Trinity Consultants 2021), CalEEMod 2022 User Guide Appendix G (California Air Resources Board 2022b), MARPOL Regulations and EPA Port Emissions Inventory Guidance (EPA 2020). Marine vessel and portable equipment horsepower and hours of use per day were provided by DCOR.

Table 4.2-1 below provides a summary of the estimated annual and total emissions for the well stimulation activities.

Table 4.2-1. Estimated Annual and Total Well Stimulation Emissions

Work Task	Units	NO_x	ROG	PM_{10}*	$PM_{2.5}$*	CO	SO_2
Campaign 1	Tons/year	5.55	0.121	0.141	0.138	4.37	0.009
Campaign 2	Tons/year	5.55	0.121	0.141	0.138	4.37	0.009
Campaign 3	Tons/year	4.71	0.097	0.135	0.131	3.34	0.007
Total Program Emissions*	Tons	15.8	0.338	0.417	0.406	12.1	0.026

*Represents three separate one-year campaigns over a five-year period

Implementation of the well stimulation activities is estimated to result in exceedances of the NSR threshold of five tons/year for NO_x during Campaigns 1 and 2 that will need to comply with CARB and VCAPCD regulations. No other criteria pollutants are expected to exceed their respective NSR threshold. Emissions in **Table 4.2-1** include emissions from the use of the existing Platform support vessel, the *WMT*. The use of the *WMT* and its resulting emissions are covered under the PTO, therefore these emissions do not represent an increase from the current permitted emissions. **Table 4.2-2** provides a summary of the estimated annual emissions for the well stimulation activities without the already permitted emissions from the *WMT*.

In addition, the Platform Gilda PTO permits a total annual fuel throughput of 253,390 gallons for both crew boats and work boats, such as the *WMT*. A review of fuel consumption data from March 2025 to June 2025 indicates that the *WMT* averaged 360 gallons per day. Using this average, the *WMT* would use approximately 10,453 gallons per year during the well stimulation activities and is not expected to cause overall fuel consumption to exceed the throughput currently permitted in the PTO.

Table 4.2-2. Estimated Annual and Total Well Stimulation Emissions without *WMT* Emissions

Work Task	Units	NO_x	ROG	PM_{10}*	$PM_{2.5}$*	CO	SO_2
Campaign 1	Tons/year	2.92	0.084	0.022	0.022	3.60	0.007
Campaign 2	Tons/year	2.92	0.084	0.022	0.022	3.60	0.007
Campaign 3	Tons/year	3.09	0.060	0.015	0.015	2.57	0.005
Total Emissions*	**Tons**	**7.94**	**0.228**	**0.058**	**0.058**	**9.76**	**0.019**

*Represents three separate one-year campaigns over a five-yearperiod.

With the removal of emissions from the *WMT*, well stimulation activities would not exceed the NSRs threshold of 5 tons/year for NO_x during any of the three campaigns.

The Proposed Action will increase production of oil and cause total criteria and precursor emissions to increase by 19 tons a year without the *WMT* vessel (**Table 4.2-2**) and 28 tons a year with the use of the vessel (**Table 4.2-1**).

The well stimulation activities will comply with CARB CHC regulations and VCAPCD rules. In addition, power generation on Platform Gilda will be conducted in compliance with the requirements of the PTOs issued by the VCAPCD. PTO inspections will be conducted as required.

Greenhouse Gas Emissions

This section provides estimates of GHG emissions associated with the proposed well stimulation activities, which have been associated with changing environmental baselines.

GHG emissions for the marine vessel and portable equipment utilized during the well stimulation portion of the Proposed Action were estimated by DCOR using established emission factors from the CARB’s CalEEMod User’s Guide, Appendix D, Default Data Tables (Trinity Consultants 2021), CalEEMod 2022 User Guide Appendix G (California Air Resources Board 2022b), MARPOL Regulations and. EPA Port Emissions Inventory Guidance (EPA 2020). Marine vessel and portable equipment horsepower and hours of use per day were provided by DCOR.

Table 4.2-3. Estimated Well Stimulation Activity GHG Emissions

Work Task	Units	N_2O	CH_4	CO_2	$MTCO_2E$
Campaign 1	Tons/year	0.019	0.022	1,060	1066
Campaign 2	Tons/year	0.019	0.022	1,060	1066
Campaign 3	Tons/year	0.017	0.016	833	838
Total Emissions	**Tons**	**0.055**	**0.060**	**2,952**	**2,969**

GHG emissions from well stimulation activities are projected to remain below the VCAPCD significance threshold of 10,000 $MTCO_2E$ during each of the three campaigns.

Life Cycle Greenhouse Gas Analysis

This section provides an analysis of life cycle GHG emissions associated with the Proposed Action. These GHG emissions primarily include CO_2, CH_4, and N_2O. Upstream activities include well stimulation activities and associated vessel activities. Midstream and downstream activities pertain to onshore processing, transportation, and fuel consumption by the consumer.

Life Cycle Greenhouse Gas Emissions Estimating Methodology

The Greenhouse Gas Life Cycle Energy Emissions Model (GLEEM) was used to estimate midstream and downstream emissions (Wolvovsky 2025). Upstream GHG emissions were calculated based on emissions from marine vessels and portable equipment used during well stimulation activities (see **Table 4.2-3**). BOEM developed GLEEM to estimate midstream and downstream GHG emissions associated with oil, natural gas, and coal. GLEEM enables users to calculate GHG emissions for various offshore oil and gas activity scenarios using the following user provided inputs:

- Lifetime projected oil production.
- Lifetime projected natural gas production.
- Upstream emissions estimates.
- Rates at which the OCS production displaces energy substitutes (not used for this analysis for reasons explained below).

Life Cycle Greenhouse Gas Emissions

Over the next 20 years, the Proposed Action on Platform Gilda is projected to produce approximately 14 million barrels of oil and 13 million cubic feet of natural gas; therefore, the GHGs emitted are estimated to total approximately 5,393,504 of $MTCO_2e$ of life cycle emissions during upstream, midstream, and downstream activities. See **Table 4.2-4** below for a summary of life cycle GHG emissions. The upstream emissions are based on the equipment DCOR expects to be used on Platform Gilda, the midstream and downstream emissions are based on GLEEM output.

Table 4.2-4. Estimated Life Cycle Total GHG Emissions from the Proposed Action

Emissions	CO_2 (metric tons)	CH_4 (metric tons)	N_2O (metric tons)	$MTCO_2e$
Upstream	2,678	0.060	0.055	2,969
Midstream	66,501	1,640	0.562	115,862
Downstream	5,257,631	207	40	5,274,949
Life Cycle	5,327,084	1,847	41	5,393,780

Production data provided by DCOR.

Table 4.2-4 provides the life cycle GHG emissions resulting directly from the OCS oil and gas anticipated from the Proposed Action.

When analyzing life cycle GHG emissions, BOEM typically considers energy market responses and the emissions associated with substitute energy sources displaced by new OCS production. BOEM uses the Market Simulation Model (MarketSim) to estimate energy market price, demand, and supply responses to new OCS oil and gas supply. As designed, MarketSim is well suited for assessment of the energy market impacts associated with large-scale changes in OCS oil and gas production, such as those represented in the National OCS Oil and Gas Leasing Program (National OCS Program).

The Proposed Action entails a small level of new production, estimating the impacts on global energy prices or the displacement of substitute energy sources is not appropriate. This is because MarketSim captures high-level interactions between oil, gas, coal, and electricity markets, and is meant to provide valuable insights into how oil and gas produced under the National OCS Program or other large-scale scenarios are likely to displace other sources of energy production. These large-scale scenarios result in measurable energy price effects at the national or international level, leading to widespread shifts in supply and demand that MarketSim is designed to capture.

For smaller scale changes in OCS oil or gas production, such as the Proposed Action, MarketSim is not appropriate for the assessment of energy displacement impacts. The energy price effects associated with small-scale projects are likely to be imperceptible in national and international energy markets and therefore would not elicit the national or global supply and demand responses represented in MarketSim. Instead, the effects of small-scale changes in offshore oil and gas production may be localized and dependent on factors not represented in MarketSim, such as local transportation constraints for oil and gas and the physical properties of the oil and gas extracted (e.g., API gravity or sulfur content). For these reasons, this analysis is limited to the life cycle GHG emissions from the Proposed Action.

In BOEM's typical GHG analyses (e.g., at the National OCS Oil and Gas Program and lease sale stages), where it considers the substitute energy sources displaced by proposed new OCS production, in addition to the potential emissions from substitute energy sources that could be displaced by the new proposed production, BOEM also considers changes in oil consumption outside the U.S. driven by global price fluctuations from new production. As discussed, because of the limited size of the Proposed Action production, BOEM is not considering substitute energy sources or the impacts to global consumption from this analysis. Examples of the relationship between the life cycle GHG emissions estimates for OCS oil and gas, displaced domestic substitute energy sources, and global energy markets can be found in Chapter 2 of the Economic Analysis Methodology for the 2024–2029 National OCS Oil and Gas Leasing Program (BOEM 2023a).

4.2.3 Water Quality

This section evaluates the potential effects of the proposed well stimulation Program on water quality. The Program would involve up to 38 frac pack stages in 16 wells over a five-year period. Activities have the potential to affect water quality through accidental discharges from the Platform and support vessels, chemical handling on the Platform, a potential loss of well integrity during stimulation, and solid waste and debris associated with Platform operations. Because stimulation is conducted entirely from the Platform with no seabed contact, turbidity and seafloor disturbance do not occur during routine operations. In addition, all stimulation fluids would be seawater based, and no fresh or potable water would be used for the stimulation treatments. Potential impacts are assessed below in relation to each pathway.

4.2.3.1 Routine Platform Discharges

Routine platform discharges, including produced water, deck drainage, sanitary waste, and non-contact cooling water, continue under the NPDES General Permit for Offshore Oil and Gas Exploration, Development, and Production Operations in Southern California (EPA Permit No. CAG280000). Under the CWA, the NPDES program is the federal permitting system that regulates point-source discharges to U.S. waters by setting enforceable effluent limits, monitoring and reporting requirements, and best management practices to protect water quality.

Deck drainage on Platform Gilda is routed through containment and oil-water separation prior to any authorized discharge. The stimulation program does not create any new overboard discharge; all stimulation flowback is retained on the Platform and reinjected through existing injection wells (closed-loop injection). The Program does not include open ocean discharge of well stimulation flowback fluids. All flowback fluid generated during stimulation activities will be routed through a closed-loop handling system and retained on the Platform. Returned stimulation fluids will be reinjected into existing approved injection wells on the Platform, and no open ocean discharge of flowback fluids will occur. Produced water remains subject to oil-and-grease limits (monthly average 29 mg/L; daily maximum 42 mg/L), a sheen prohibition, and whole-effluent toxicity (WET) requirements evaluated at the 100-meter mixing-zone point of compliance. All Platform personnel receive operational training in Safety and Environmental Management System procedures, Hazardous Waste Operations and Emergency Response training, and emergency response drills. Given closed-loop handling of flowback fluids and unchanged discharge authorization, routine Platform discharges are not expected to change in character or load.

Produced water and other routine platform discharges may contain residual hydrocarbons, trace metals, and treatment chemicals; however, these constituents are subject to effluent limitations and are discharged into a high-energy offshore environment where rapid dilution and dispersion occur. In the Santa Barbara Channel, strong currents and vertical mixing promote the rapid reduction of constituent concentrations within the water column, such that levels typically decrease below thresholds of concern within the permitted mixing zone. Because the proposed Program would not be expected to result in measurable change in the volume, composition, or frequency of authorized discharges, the fate and transport of discharged constituents would remain substantially the same, and no new or increased exposure pathways would be created. Accordingly, routine platform discharges are not expected to result in measurable changes to marine water quality.

4.2.3.2 Accidental Releases from Vessels

Program activities require periodic support from crew and supply vessels. Vessel fueling occurs only in port; no boat-to-boat fueling will be conducted. In the event of an accidental release, DCOR would implement their approved OSRP which covers both Platform and vessel operations, with pre-staged response support and resources through approved OSROs in Ventura and Santa Barbara. These measures are designed to facilitate timely containment and recovery. However, in the event of a spill, any resulting effects on water quality would be expected to be localized and temporary due to the likely size of a release, response actions and natural dilution in the marine environment.

4.2.3.3 Accidental Releases Associated with Well Stimulation Activities

Stimulation treatments require the use of several additives that serve various functions within the hydraulic fracturing process (**Table 2.4-1**). These additives are delivered to the platform in sealed containers (e.g., totes and drums) and are handled on deck within covered secondary containment systems designed to prevent releases to the marine environment. Totes and drums are staged on impermeable, steel bottom- containment pallets that are sized to capture the full volume of a container in the event of a leak. Transfers are conducted using closed-connection systems over contained deck areas to minimize the potential for spills. These deck areas are graded and drain to the Platform’s oily-water system for treatment or management.

Fluids captured within the containment systems are expected to be small in volume (drips or minor leaks during transfer) and are managed as part of the routine Platform operations. As a result, the handling of stimulation additives is not expected to measurably change the volume, composition or frequency of authorized discharges, and no new exposure pathways are expected. Together, these measures minimize the potential for spills during storage and transfer and reduce the likelihood that stimulation additives would be released during routine operations.

A typical stimulation stage is expected to use an average of 100,000 lbs of proppant; however, some stages would require closer to 75,000 lbs. **Table 4.2-5** provides a conservative summary of additive amounts and chemical constituents for the 100,000-lb scenario. In the event of an accidental release, actual chemical volumes during most stages would be proportionally lower. The toxicity of well stimulation chemical constituents has the potential to affect marine organisms. However, due to the lack of toxicity data for many constituents of well stimulation chemicals, the effects within the pelagic mixing zone are not fully characterized; available information indicates that concentrations would be substantially reduced through rapid dilution, limiting potential exposure to levels not expected to result in measurable adverse effects. Studies on marine life around producing platforms have shown that concentrations of pollutants (polycyclic aromatic hydrocarbons, polychlorinated biphenyls, dichloro diphenyl trichloroethane (DDT)) in fish were not elevated compared to those in natural areas (Argonne National Laboratory 2016), suggesting that chemicals in discharged produced water and treated stimulation fluids are not expected to occur at concentrations that would result in adverse effects to marine organisms, based on the limited volumes of potential releases and the rapid dilution and dispersion that would occur in the offshore marine environment (Argonne National Laboratory 2016).

The proposed Program incorporates controls that make releases unlikely. Under routine operations, all stimulation flowback is managed within a closed-loop fluids management system in which returns are retained on the platform and reinjected, with no discharge of stimulation fluids to the marine environment. The discussion below addresses the potential effects of an accidental release, which would not be part of the closed-loop system.

If stimulation fluids were inadvertently released into the marine environment, constituents would undergo rapid dilution and dispersion due to the dynamic hydrodynamic conditions of the Santa Barbara Channel, including strong tidal currents and vertical mixing. Many stimulation additives, such as alcohols and glycols, are highly water soluble and would dissolve readily in seawater, while others may volatilize or undergo biodegradation or photodegradation. Hydrophobic constituents, including trace petroleum-derived compounds, may adsorb to suspended particles or sediments and would be further diluted in the water column. These physical, chemical, and biological processes substantially reduce concentrations of stimulation-related chemicals in the marine environment over relatively short spatial and temporal scales (Argonne National Laboratory 2016).

Potential exposure of marine organisms to stimulation-related chemicals would be limited to the immediate vicinity of any release and would occur primarily through short-term contact with diluted constituents in the water column. Pelagic organisms such as plankton, fish larvae, and small fish could experience temporary exposure if present within the near-field mixing zone; however, concentrations would rapidly decrease with distance from the release point due to dilution and dispersion in seawater. Mobile organisms, including fish and marine mammals, would likely avoid localized areas of disturbance. The potential biological exposure resulting from accidental releases would therefore be localized, temporary, and unlikely to result in measurable population-level effects (Argonne National Laboratory 2016).

Although certain stimulation additives may exhibit toxicity at high concentrations, the volumes potentially released during accidental events would be small relative to the receiving marine environment. Rapid dilution in seawater would substantially reduce chemical concentrations, and discharge limits and monitoring requirements under the NPDES permit, including WET testing, are designed to ensure that authorized discharges do not result in unacceptable toxicity to marine organisms. Dilution in the water column would reduce concentrations of stimulation-related constituents below levels expected to cause acute or chronic toxicity within a relatively short distance from the release point (Argonne National Laboratory 2016). Compliance with NPDES permit requirements reduces potential impacts but does not substitute for the independent evaluation of environmental effects presented in this analysis.

Table 4.2-5. Additive Amounts and Chemical Constituents for a 100,000-Pound Frac Pack Treatment

Additive (Product ID)	Per-stage Amount	Program Total Amount*	Chemical Constituents (CAS #)
Environmental Guar Slurry (J564)	500 gal	19,000 gal	2-Butoxyethanol (111-76-2)
EZEFLO Surfactant (F103)	120 gal	4,560 gal	Propan-2-ol (67-63-0) 2-Butoxyethanol (111-76-2) Ethoxylated C11 Alcohol (34398-01-1) Ethoxylated Alcohol (68131-39-5) 1-undecanol (impurity; 112-42-5)
Emulsion Preventer (W054)	55 gal	2,090 gal	Methanol (67-56-1) Oxirane, Methyl-, polymer with Oxirane (9003-11-6) Alcohols, C7-9-iso-, C8-rich, ethoxylated (78330-19-5) Alcohols, C9-11-iso-, C10-rich, ethoxylated (78330-20-8) Alcohol, C11-14, ethoxylated (78330-21-9) N,N-Dimethyl-N-dodecyl benzylaminium chloride (139-07-1) Solvent naphtha (petroleum), heavy arom. (64742-94-5) 2-Propen-1-aminium, N,N-dimethyl-N-2-propen-1-yl-, chloride (1:1), homopolymer (26062-79-3) Naphthalene (impurity; 91-20-3)
Scale Inhibitor (L065)	55 gal	2,090 gal	Ethylene glycol (107-21-1) Sodium chloride (7647-14-5) Calcium chloride (10043-52-4)
Borate Crosslinker (J532)	350 gal	13,300 gal	Sodium tetraborate decahydrate (1303-96-4)
EB-Clean Breaker (encapsulated; J475)	150 lb	5700 lb	Diammonium peroxodisulphate (7727-54-0) Aliphatic co-polymer (proprietary)
Breaker (raw; J218)	20 lb	760 lb	Diammonium peroxidisulphate (7727-54-0)
Biocide (M275)	20 lb	760 lb	reaction mass of: 5-chloro-2-methyl-4-isothiazolin-3-one [EC no. 247-500-7] and 2-methyl-2H-isothiazol-3-one [EC no. 220-239-6] (3:1) (55965-84-9)

Note: *Program totals assume 38 stages.

Sea Surface Accidents

The most likely spill scenarios associated with well stimulation activities are small leaks during chemical transfer or equipment disconnections. Liquids spilled on deck would be expected to be contained, recovered, and managed for reuse or onshore disposal. With these measures and closed-loop reinjection of all flowback, accidental stimulation-related releases would be localized to the deck and would not measurably affect receiving water quality. Consistent with the Well Stimulation Programmatic Environmental Assessment, sea surface releases would result in short-term, localized water quality effects that would rapidly diminish with distance from the release point due to dilution in seawater (Argonne National Laboratory 2016).

Sub-Seafloor Accidents

There is a low likelihood of a release during stimulation due to the substantial depth of the target formations. Stimulation would occur at depths greater than approximately 4,500 ft (1,371 m) below the seafloor surface and the fracturing height and half-lengths would be a fraction of the stimulation depth (150–300 ft and 100–200 ft, respectively). The large separation between the stimulated zone and the seafloor, along with the presence of intervening geologic layers, limits the potential for fractures to propagate to the seafloor.

As described in the Well Stimulation Programmatic Environmental Assessment (**Section 4.3**; Argonne National Laboratory 2016), fracture heights in offshore formations are typically confined by geologic barriers and do not extend thousands of feet to the seafloor. Accordingly, sub-seafloor releases resulting in a surface expression are considered highly unlikely. In the unlikely event that fluids were to migrate upward, concentrations reaching the seafloor would be substantially attenuated by dispersion within the subsurface and further reduced by dilution in the overlying water column. Any resulting effects on water quality would therefore be expected to be localized and temporary and would be further limited by response measures. In addition, implementation of several safe guards including well integrity monitoring and testing practices further minimize these risks.

Before stimulation, an independent registered professional engineer will verify and sign planned casing programs for compliance with 30 CFR 250.420 and certify that they are suitable under expected wellbore conditions. Casing design, including liners, is required to withstand tensile, compressive, and buckling loads, burst and collapse pressures, thermal effects, and combinations thereof. The well is constructed with steel casing that is sealed in place with cement to isolate all hydrocarbon-bearing zones from the surrounding formations. This cement barrier extends a minimum of 500 ft MD above the base of the casing shoe and above the uppermost hydrocarbon-bearing zone. Before stimulation begins, the production casing or liner ais pressure tested to confirm it can safely withstand the pressures used during treatment. Test results are recorded and pressures are monitored during stimulation to detect for signs of leakage or loss of integrity.

WCD scenarios and spill response planning for Platform Gilda, including those applicable to well stimulation activities, are addressed in **Section 2.10** above, as well as by DCOR's approved OSRP, which complies with 30 CFR 550.243(h) and 550.250(a). The WCD specific to the proposed Program is less than or equal to the currently approved WCD for Platform Gilda under the existing DPP and is therefore already covered by existing spill response planning and response capabilities (See **Section 2.10.2**).

As described in the Well Stimulation Programmatic Environmental Assessment, even in the unlikely event of an accidental release, effects on water quality would be localized, temporary, and reduced through rapid dilution and implementation of spill response measures (Argonne National Laboratory 2016).

4.2.3.4 Trash and Marine Debris

The proposed Program would generate small quantities of solid waste, including packaging materials, spent containers, and routine operational debris. All trash and debris would be managed in accordance with Platform waste management procedures, with materials collected, stored, and transported to shore for proper disposal or recycling. No disposal of solid waste to the ocean is authorized. As a result, the proposed Program is not expected to contribute measurably to marine debris, and any inadvertent loss of materials would be minimal and managed through existing waste control procedures.

4.2.3.5 Turbidity and Seafloor Disturbance

Stimulation activities would be conducted entirely from the existing Platform with no anchoring or seabed contact by construction assets, no conductor or jacket cutting, and no seabed excavation or jetting. Because anchoring is a primary cause of turbidity during offshore activities and anchoring would not occur, the proposed Program is not expected to result in sediment resuspension or increased turbidity in the water column. Water clarity and suspended sediment concentrations would remain unchanged.

Design features of the proposed Program, including closed-loop handling of stimulation fluids, secondary containment for chemicals, continued compliance with NPDES permit requirements, and implementation of spill prevention and response plans, are integral components of the Program and serve to avoid or minimize potential water quality impacts. When considered together with the absence of seafloor disturbance, these measures ensure that impacts to water quality would be localized and temporary.

4.2.4 Biological Resources

Well stimulation activities, including hydraulic fracturing and related treatments and workover activities have been analyzed with respect to biological resources in multiple published documents in compliance with the ESA. These reports are incorporated by reference and summarized below.

The analyses in the abovementioned documents evaluated well stimulation-related risk pathways, including platform and vessel noise, authorized liquid discharges**,** and spill risk. The resource agencies documented that well stimulation treatments are part of the routine drilling and production operations constrained by established discharge limits, handling and containment requirements, and species-protection measures, and therefore do not identify distinct, unmitigated exposure pathways unique to well stimulation treatments beyond those already analyzed for comparable operational phases. Furthermore, they determined that the reinjection of drilling fluids, limited quantity of releases, application of mixing-zone monitoring requirements, and dilution by natural ocean currents reduce the concentrations of potential contaminants; therefore, discharges related to oil and gas operations are not likely to adversely affect ESA-listed species (BOEM 2023b; 2025).

Potential impacts due to Program activities analyzed in this EIS include an increase in vessel traffic, potential degradation of water quality and seafloor habitats from the discharge of contaminants in the event of an accidental spill from Program vessels or well casings and increased underwater noise. Potential impacts to birds from artificial lighting were considered, but the project proponent has given BOEM written confirmation that no additional artificial lighting will be added for night operations above the existing baseline at Platform Gilda. Over the proposed five-year Program, it is anticipated that up to six wells could be stimulated in a single year, with 16 wells total planned for stimulation, depending on operational logistics, permitting timelines, and equipment availability. These proposed stimulation wells will increase Platform Gilda's production above current volumes while still being below both the historical maximum and the level approved in the original DPP. Potential impacts are described below.

4.2.4.1 Vessel Traffic

Each stimulation campaign will require a crew of approximately ten specialized personnel, including crew supervisors, equipment operators, engineers, and safety staff. Personnel will be mobilized to the Platform via crew transfer vessels in coordination with existing Platform logistics.

The stimulation Program is planned over a five-year period, with up to six wells stimulated during a single year campaign. The Program schedule is expected to follow a batch completion model, wherein each year's group of wells is completed during a single annual campaign. Each well stimulation will be performed over one day at the Platform, followed by a three-day standby period before the next stage. Equipment needed for well stimulation will be mobilized and demobilized every year over the five-year period, resulting in approximately 88 additional trips per year to Platform Gilda.

During these trips, Program vessels will use (or continue to use) the existing U.S. Coast Guard TSS and JOFLO corridors within the Santa Barbara Channel. During Program-related transit, captains are directed to remain at least 100 m away from all sighted whale species, and 50 m away from dolphins and sea turtles (NOAA Fisheries 2026). The limited amount of project-related vessel traffic over five years relative to existing vessel traffic in the Santa Barbara Channel area would contribute a negligible amount to the overall vessel traffic in the area. Therefore, we expect impacts from vessel traffic associated with the Proposed Action to marine resources would be discountable.

4.2.4.2 Underwater Noise

Increased noise levels affecting the pelagic environment would occur during vessel transit while mobilizing and demobilizing well stimulation equipment each year on Platform Gilda. Transiting vessels generate continuous (non-impulsive) sounds from their engines, propeller cavitation, onboard machinery, and hydrodynamics of water flow (Cooperman et al. 2024). The actual radiated sound depends on several factors, though generally vessel noise increases with ship size, power, speed, propeller blade size, number of blades, and rotations per minute. Small vessels, like those used for crew transport, typically produce higher-frequency sound than large container ships, with most energy concentrated in the 1–5 kHz (kiloHertz) range. Kipple and Gabriele (2003) measured underwater sound from vessels ranging from 14- to 65-ft long (25 to 420 horsepower) and back-calculated source levels to be 157–181 dB re 1 µPa·m (decibels relative to the pressure of 1 micropascal). Hearing in sea turtles has been measured through electrophysiological and behavioral studies both in air and water on a limited number of life stages for each of the five species. In general, sea turtle hearing ranges between 50 Hz (Hertz) and 1.6 kHz, they hear best in water between 100–750 Hz, but do not hear well above 1 kHz, and are generally less sensitive to sound than marine mammals (Muirhead et al. 2026), with an SPL of 175 dB re 1 µPa, for behavioral disturbance. Vessel noise may impact sea turtle behavior, leading to temporary startle responses, altered submergence patterns, masking of biologically relevant sounds, and physiological stress (National Science Foundation 2011; Samuel et al. 2005). Sea turtles may exhibit a startle reaction (such as diving or swimming away) and temporary stress responses by increasing submergence time, extending dive durations, or surfacing (Finneran et al. 2017; McCauley et al. 2000b). Hazel et al. (2007) found that sea turtles typically respond behaviorally to vessels at approximately 10 m or closer, suggesting their detection of approaching vessels relies more on visual than on acoustic cues. Similarly, Lester et al. (2013) showed that the diamondback terrapin did not alter its behavior in response to recorded boat noise. Díaz et al. (2024) found that traveling green sea turtles increased vigilance with increasing vessel noise. However, those resting on the seabed did not exhibit increased vigilance, suggesting that sea turtles may also respond differently when in different behavioral states.

Current evidence indicates that sea turtles respond to vessel noise at very close ranges, making population-level impacts unlikely. While behavioral responses do occur, attributing them specifically to noise rather than visual or other cues remains challenging. Reactions such as avoidance behavior may disrupt essential activities like feeding. Therefore, it is prudent to consider that noise from vessels could elicit behavioral changes, such as evasive maneuvers, potentially leading to short-term behavioral changes and auditory masking.

Well stimulation activities have the potential to create underwater noise similar, but likely not as loud as, noise levels created during Platform drilling activities. There is very little information on the impacts of drilling and production noise on sea turtles. However, sea turtle hearing sensitivity is within the frequency range (100–1,000 Hz) of sound produced by low-frequency sources such as marine drilling (Popper et al. 2014). It is unlikely that sounds from drilling will reach injury thresholds, unless the sea turtle is within very close proximity to the drilling activity (Finneran et al. 2017; McCauley et al. 2000a; Piniak et al. 2012). Drilling-related noise is continuous, and source levels for drillships have been reported to be as high as 191 dB re 1 µPa during drilling, which exceeds the behavioral disturbance threshold of SPL of 175 dB re 1 µPa for sea turtles. These sounds are more likely to cause temporary avoidance or displacement of sea turtles. Studies of sea turtles in the proximity of platforms are not conclusive on whether turtles habituate to a continuous sound source.

Science (Southall et al. 2019) and regulations (NMFS 2024a) now recognize at least eight functional hearing groups: low-frequency cetaceans, high-frequency cetaceans, very-high-frequency cetaceans, sirenians, phocids in air, phocids in water, other marine carnivores in air, and other marine carnivores in water (Southall et al. 2019) (**Table 4.2-6**).

Table 4.2-6. Marine mammal functional hearing groups and acoustic thresholds identifying the onset of auditory injury for marine mammals from impulsive and non-impulsive sound sources

Hearing Group	Generalized Hearing Range	Onset of Auditory Injury from Non-Impulsive Sound
Low-frequency (e.g., Baleen Whales)	7 Hz to 36 kHz	197 dB cSEL
High-frequency (e.g., Toothed Whales)	150 Hz to 160 kHz	201 dB cSEL
Very-high frequency (e.g., Porpoise)	200 Hz to 165 kHz	181 dB cSEL
Phocid pinnipeds (True Seals) (underwater)	40 Hz to 90 kHz	195dB cSEL
Otariid pinnipeds (Sea Lions and Fur Seals) (underwater)	60 Hz to 68 kHz	199 dB cSEL

Notes: Created using NMFS (2025b)
cSEL = Cumulative sound exposure level (decibel referenced to 1 micropascal squared seconds [dB s]), Peak = Peak sound pressure level (decibel referenced to 1 micropascal [dB re 1 µPa]); dB = decibels; Hz = hertz; kHz = kilohertz

Auditory injury and Temporary Hearing Loss: An animal's auditory sensitivity to a sound depends on the spectral, temporal, and amplitude characteristics of the sound (Richardson et al. 1995). When exposed to sounds of significant duration and amplitude (typically within close range of a source), marine mammals may experience noise-induced threshold shifts and auditory injury, which includes, but is not limited to, Permanent Threshold Shift (PTS). PTS is an irreversible loss of hearing due to hair cell loss or other structural damage to auditory tissues (Henderson et al. 2008; Saunders et al. 1985). Temporary Threshold Shift (TTS) is a relatively short-term (e.g., within several hours or days), reversible loss of hearing following noise exposure (Finneran 2015; Southall et al. 2007), often resulting from hair cell fatigue (Saunders et al. 1985; Yost 2000). During TTS, the animal's hearing threshold rises, meaning that a sound must be louder to be detected. Prolonged or repeated exposure to sounds at levels that are sufficient to induce TTS—without adequate recovery time—can lead to auditory injury, including PTS (Finneran 2015; Southall et al. 2007). Research suggests that some odontocete species may have mechanisms to selectively reduce their hearing sensitivity when provided with a precursory cue that an intense sound is just about to arrive, which may help to protect themselves from auditory injury or TTS (Nachtigall and Supin 2013).

Behavioral Impacts: When exposed to underwater sound, marine mammals may show varying levels of behavioral disturbance ranging from no observable response to overt behavioral changes. They may flee from an area to avoid the noise source, change their vocal activity, stop or change foraging behaviors, or change their typical dive or social behavior, among other responses (National Research Council 2003). The implications of behavioral disturbance can range from temporary displacement of an individual to long-term consequences on a population, such as a reduction in fitness related to decreased foraging success.

Studies have shown that noise level alone often fails to reliably predict behavioral responses because several contextual factors play a role in whether and how an animal will respond (DeRuiter et al. 2013; Ellison et al. 2011; Gomez et al. 2016; Richardson et al. 1995; Southall et al. 2007). Some of these factors include the following:

1) Exposure context (e.g., behavioral state of the animal, habitat characteristics)
2) Biological relevance of the signal (e.g., whether the signal is audible, whether the signal sounds like a predator)
3) Life stage of the animal (e.g., juvenile, mother and calf)
4) Prior experience of the animal (e.g., is it a novel sound source)
5) Sound properties (e.g., duration of sound exposure, SPL, sound type, mobility/directionality of the source)

Physical properties of the medium that may affect how the sound propagates (e.g., bathymetry, temperature, salinity (Southall et al. 2021)).

Avoidance of vessels and vessel noise has been observed in several pelagic, schooling fishes, including Atlantic herring (Vabø et al. 2002), Atlantic cod (Handegard et al. 2003), and others (reviewed in De Robertis and Handegard 2013; Pieniazek et al. 2023). Fish may dive toward the seafloor, move horizontally out of the vessel's path, or disperse from their school (De Robertis and Handegard 2013). These types of changes in schooling behavior could render individual fish more vulnerable to predation but are unlikely to have population-level effects.

A body of recent work has documented other, more subtle behaviors in response to vessel noise but has focused mainly on tropical reef-dwelling fish. For example, damselfish antipredator responses (Ferrari et al. 2018; Simpson et al. 2016) and boldness (Holmes et al. 2017) seem to decrease in the presence of vessel noise, while nest-guarding behaviors seem to increase (Nedelec et al. 2017). However, there also is some evidence of habituation. Nedelec et al. (2016) found that domino damselfish increased hiding and ventilation rates after 2 days of vessel sound playbacks but responses diminished after 1–2 weeks, indicating habituation over longer durations.

Subtle changes to social behaviors and communication, rather than dramatic effects such as injury or mortality, are important for evaluating the potential consequences of noise on reproductive success and species survival. Data from a playback study on African cichlids showed that when exposed to pure tones of 100 Hz–2 kHz, the fish were less likely to interact with one another in territorial, courtship, or reproductive interactions, and females had a lower incidence of spawning and reduced hearing capabilities than non-exposed animals (Butler and Maruska 2020).

It is possible that vessel noise could induce physiological stress or lead to acoustic masking in fishes. Several studies have shown an increase in cortisol, a stress hormone, after playbacks of vessel noise (Celi et al. 2016; Nichols et al. 2015; Wysocki et al. 2006), but other work has shown that the handling stress of the experiment itself may induce a greater stress response than an acoustic stimulus (Harding et al. 2020; Staaterman et al. 2020).

The cavitation of vessel propellors produces low-frequency, nearly continuous sound that is audible by most fishes and invertebrates and could mask important auditory cues, including conspecific communication (Haver et al. 2021; Parsons et al. 2021). Stanley et al. (2017) demonstrated that the communication range of both haddock and cod (species with swim bladders but lacking connections to the ear) would be significantly reduced in the presence of vessel noise, which is frequent in their habitat in Cape Cod Bay. Vieira et al. (2021) found a reduction in acoustic energy of meagre chorusing, as well as a reduction in the ability to discriminate conspecific calls during the passage of a ferryboat, suggesting a significant masking effect of vessel noise, which could impact spawning behavior (Vieira et al. 2021).

Generally speaking, species that are sensitive to acoustic pressure would experience masking at greater distances than those that are only sensitive to particle motion. Rogers et al. (2021) and Stanley et al. (2017) theorize that fish may be able to use the directional nature of particle motion to extract meaning from short range cues (e.g., other fish vocalizations) even in the presence of distant noise from vessels.

For determining injury for protected fish, NMFS' ESA acoustic threshold summary was used (NMFS 2025a). NMFS does not distinguish between fishes of different groups (e.g., elasmobranchs or teleosts) but rather divide impacts by size of the fish (**Table 4.2-7**).

Table 4.2-7. Acoustic thresholds identifying the onset of behavioral injury for fish

Fish size	Onset of behavioral Injury
Fishes ≥ 2g	150 dB
Fishes < 2g	150 dB

Notes: dB =decibels (NMFS 2025a)

Program vessels will continue to use corridors within the Santa Barbara Channel and are not anticipated to increase underwater noise significantly within the Program region. The limited amount of project-related vessel traffic relative to existing vessel traffic in the Santa Barbara Channel area would contribute a negligible amount to the overall noise levels in the area. Any contribution is likely small in the overall environment of regional ambient sound levels. A vessel's transit past an individual animal could result in a brief impact to the individual's ability to feed, reproduce, or avoid predators. Brief interruptions in sheltering or communication via masking are possible, but unlikely given the ability of marine mammals, sea turtles, and fish to move away from vessel disturbances and to quickly resume normal behaviors once the vessel moved past. Therefore, noise from additional marine vessel traffic could result, at most, in a localized **minor** impact to marine mammals, sea turtles, and fish.

Well stimulation activities have the potential to create underwater noise similar to noise levels created during Platform drilling activities. Although sounds similar to the noise levels associated with drilling may contribute to a localized increase in ambient sound levels, it will not produce sound levels over great enough distances to cause disturbance. Due to the stationary and localized effects of platform-associated sounds, animals encountering platform sounds would be very brief as they swim by, and the potential effects of these sounds to disturb animals will be insignificant. Any marine mammals, sea turtles and fish species approaching the platform would be fully aware of its presence before approaching close enough to experience harassment. Pressurized fluids would likely cause conductors to vibrate, creating indirect underwater noise sources. In addition, equipment activity and Program operations originating on the Platform have the potential to create noise that may penetrate the water column; however, well stimulation activities would be temporary and only **minor** impacts, if any, are expected from well stimulation activities.

4.2.4.3 Water Quality

Accidental Release of Well Stimulation Fluid

Accidental release of well stimulation fluid could adversely affect water quality and associated marine biota. In general, field studies have shown that the concentrations of trace metals and hydrocarbons in the tissues of fish around production platforms are within background levels and that effects of produced water discharges on benthic organisms and fish species have not been observed and are not expected to affect the available prey base for ESA-listed marine mammals, sea turtles, or marine birds (Argonne National Laboratory 2016; BOEM 2023b).

The proposed Program incorporates layered engineering and procedural controls that make such releases unlikely. All stimulation flowback is contained in a closed-loop fluids management system in which returns are retained on the platform and reinjected. Chemical handling and containment are managed through covered secondary containment, closed-connection transfers over contained deck areas, and segregation of incompatible materials. Well integrity is verified by an independent registered professional engineer who reviews and certifies casing programs for compliance with 30 CFR 250.420; casing and liners are designed to withstand anticipated stresses, cemented to isolate hydrocarbon-bearing zones, and pressure tested before stimulation to confirm mechanical integrity. Produced-water management will remain in compliance with, and subject to monitoring under, the active NPDES permit, including limits for oil and grease, WET, and a sheen prohibition. The base fluid for all treatments is filtered seawater sourced directly from the surrounding marine environment using Platform Gilda's existing seawater pumps; this fluid is mixed with chemical additives to form a viscous gel capable of transporting proppant (high-grade silica sand) under high-pressure conditions, with a full description of additives provided in **Section 2.6** (Fluids, Additives, and Source Materials). Though an accidental release would have the potential to cause significant impacts, the combination of mandated well-integrity testing conducted prior to and throughout stimulation (including pressure testing of casing and tubing to confirm the absence of leaks), robust containment and transfer practices, and permit-driven monitoring and discharge limits reduces the probability of occurrence to a low level; additional details on leak-prevention requirements are provided in **Section 2.10.2** (Well Integrity Monitoring and Safety).

In the event of an accidental release, well stimulation fluids entering the marine environment could result in short-term degradation of water quality in the immediate vicinity of the Platform. These fluids could lead to an increase in turbidity, introduce localized chemical concentrations, and reduce water quality through oxygen demand or toxicity (at sufficiently high concentrations). Marine organisms within the near-field area, including plankton, fish larvae, invertebrates, marine mammals and sea turtles could experience temporary exposure through direct contact with contaminated water; sessile or slow-moving organisms would be more susceptible than mobile species. However, in the offshore environment of the Santa Barbara Channel, strong currents and vertical mixing would promote rapid dilution and dispersion of released fluids, such that concentrations would decrease quickly with distance from the release point. As a result, any impacts to water quality and marine biota would be expected to be localized, temporary, and limited to the immediate vicinity of the release.

Oil Spill Potential. The unintentional release of petroleum into the marine environment from proposed Program activities is limited to Program vessels and equipment. A petroleum release could result in potential impacts to the marine biota, particularly avifauna and early life stage forms of fish and invertebrates, which are sensitive to those chemicals. Refined products (e.g., diesel, gasoline.) are more toxic than heavier crude or heavy, residual petroleum fuels, and the loss of a substantial amount of fuel or lubricating oil during standard vessel operations could affect the water column, seafloor, and associated biota, resulting in their mortality or substantial injury, and in alteration of the existing habitat quality.

Oil exposure may adversely affect marine organisms and their physiology. For example, physiological effects from oil spills on marine life could include the contamination of protective layers of fur or feathers, loss of buoyancy, loss of locomotive capabilities, and lethal and sublethal toxicity (e.g., Grosell and Pasparakis 2021; Helm et al. 2015). A small oil spill from a marine vessel associated with Project activities would be expected to produce short-term, localized water-column impacts but is unlikely to result in long-term or population-level effects on marine fish or EFH, based on the environmental setting and known spill toxicity pathways. Refined petroleum products, such as diesel or lubricating oils, which are the most common substances associated with small vessel releases, are more acutely toxic than crude oil and can rapidly affect early life stages of fish by impairing feeding behavior, damaging embryonic development, and causing genetic and physiological stress (Grosell and Pasparakis 2021). Nonetheless, these products also evaporate and disperse relatively quickly, limiting the duration of exposure. Fish larvae and embryos are the most sensitive life stages, with even low-level hydrocarbon exposure capable of causing deformities or mortality systems (Carls et al. 1999; Malins and Hodgins 1981; Pasparakis et al. 2019). However, any spill originating from Project-related vessels is considered unlikely and small in scale, and would occur in a highly dynamic water column where natural dilution and advection reduce concentrations rapidly.

Program activities are not expected to have long-term, significant effects on open water habitat or species. A regional OSRP has been developed and will be used to direct the containment and recovery of any Program-related vessel or equipment spills that would have the potential to be accidentally released into the marine waters. In addition, onboard and supporting equipment and the procedures specified in the spill plan are expected to reduce the effects of accidentally discharged petroleum by facilitating rapid response and cleanup operations. The Program vessels will adhere to a zero-discharge policy. Due to the small size of the proposed Program vessels, in combination with the use of established vessel traffic lanes, the potential release of fuel and its resulting impacts are not likely to affect marine wildlife.

The base fluid for all treatments will be filtered seawater that is part of an existing system considered within the NPDES permit (using existing seawater pumps) and maintained for both regulatory compliance and as a safety measure, and so the amount of seawater sourced locally from the environment will not be above existing baseline levels drawn within existing system parameters.

4.2.5 Commercial and Recreational Fishing

Potential impacts due to Program activities include space-use conflicts from a minor increases in vessel presence and a possible increase for marine debris, and a potential degradation of water quality and seafloor habitats from the incidental discharge of contaminants in the event of an accidental spill during Program activities. Potential impacts are described below.

4.2.5.1 Vessel Safety Zone

Impacts to commercial and recreational fishing operations are expected to be minor, given that few fishers operate close to the Platform, and fishers avoid fishing nearby due to the risk of gear entanglement and loss. The proposed activities occur within the existing platform safety zone, which extends out 1,640 ft (500 m) from the outer edge of Platform Gilda. This safety zone applies to all vessels over 100 ft (30.4 m), and is recommended for vessels less than 100 ft. There are no registered commercial fishing vessels in California that exceed 100 ft. Program activities would be centralized on the Platform during well stimulation and are not anticipated to impact commercial and recreational fishing access outside of the existing safety zones. To support Program activities, 88 vessel trips will be added to the existing supply and crew boats support schedule for Platform Gilda; however, Program vessels would use (or continue to use) established UUSCG TSS lanes and JOFLO corridors within the Santa Barbara Channel. At all times, Program vessels would operate using the highest level of navigational safety and in accordance with applicable international and USCG regulations and guidelines, thereby minimizing potential interference with ongoing fishing activities.

4.2.5.2 Accidental Release of Contaminants

The unintentional release of well stimulation fluid into the marine environment from proposed Program activities could result in impacts to water quality, marine life, and associated fisheries in the region and are reviewed in **Section 4.2.4**. The proposed Program incorporates layered engineering and procedural controls that make such releases unlikely, as discussed in **Section 2.10**. Furthermore, the unintentional release of petroleum into the marine environment from proposed Program activities is limited to Program vessels and equipment. Though a petroleum release could result in potential impacts to the marine biota, a regional OSRP has been developed and will be used to direct the containment and recovery of any Program-related vessel spills that would have the potential to be accidentally released into the marine waters. In the unlikely event of an accidental release of contaminants, the regional stocks of harvested species are not expected to be compromised to the extent that long-term viability of fisheries would be affected.

4.2.5.3 Seafloor Habitats

All construction and support vessels associated with the well stimulation program would use pre-existing moorings and would not anchor or otherwise contact the seabed, thereby avoiding the creation of hazards (e.g., anchor scars) to bottom-contact fishing gear.

4.2.5.4 Trash and Marine Debris

In the past, marine oilfield debris occasionally caused gear loss and preclusion zones for fishers (Caselle et al. 2002). All project activities will be managed in accordance with Platform waste management procedures, with materials collected, stored, and transported to shore for proper disposal or recycling. No disposal of solid waste onto the ocean is likely to occur. As a result, the proposed Program would not contribute to marine debris or adversely affect fishing activities.

4.2.6 Recreation and Tourism

Potential impacts due to Program activities include minor increases in vessel traffic in the Santa Barbara Channel for the duration of the Program. Potential impacts are described below.

4.2.6.1 Vessel Safety Zone

Recreation and tourism opportunities are limited within the Program area as proposed activities will occur within the existing Platform safety zone, which extends out 1,640 ft (500 m) from the outer edge of Platform Gilda. This safety zone applies to all vessels over 100 ft (30.4 m) and is recommended for vessels less than 100 ft. Program activities would be centralized on each Platform during well stimulation and are not anticipated to impact recreational activities outside of the existing safety zones. Furthermore, Program vessels will use (or continue to use) the existing USCG TSS and JOFLO corridors within the Santa Barbara Channel. Program vessels must operate in accordance with International and USCG regulations and guidelines.

4.2.7 Socioeconomics

During Program activities, work would occur on Platform Gilda, within the existing safety zone and along established vessel transit routes. Tourism, recreation and commercial ocean industries that operate in the region would not be displaced during Program activities and would continue to have access to areas outside of the existing safety zone; therefore, there should be no direct effects to socioeconomics aside from goals of domestic production and the benefit of local oil and gas industry jobs.

The unintentional release of well stimulation fluid into the marine environment from proposed Program activities could result in potentially major impacts to water quality and ocean-dependent industry. However, impacts are not anticipated due to well integrity testing which will be conducted before and throughout any stimulation activity, including pressure testing of the casing and tubing to confirm the absence of abnormalities. Pre-stimulation wellbore verification would include well integrity reviews, including oversight by an independent registered professional engineer who reviews and certifies casing programs in compliance with 30 CFR 250.420. Casing and liners are designed to withstand anticipated pressures, cemented to isolate hydrocarbon-bearing zones, and pressure tested prior to stimulation to confirm mechanical integrity. A full discussion of the regulatory requirements of well stimulation testing and monitoring is detailed in **Section 2.8**. The Program does not propose to perform any open ocean releases and all stimulation flowback is retained on the Platform and reinjected.

Chemical handling and containment on the Platform would be monitored and reported, as required by the EPA, and would include covered secondary containment, closed-connection transfers over contained deck areas and segregation of incompatible materials. Unintentional releases of petroleum could occur from Program vessels and equipment. Program vessels will use (or continue to use) the existing TSS and JOFLO corridors within the Santa Barbara Channel. Program vessels must operate in accordance with international and USCG regulations and guidelines.

Though a petroleum release could result in potential impacts to the marine biota, a regional OSRP has been developed and will be used to direct the containment and recovery of any Program-related vessel spills that would have the potential to be accidentally released into the marine waters. The OSRP includes detail on OSRO coverage and drills to ensure readiness for any vessel or Platform-related spill.

4.3 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVE 2: NO ACTION

Under Alternative 2, the baseline conditions and ongoing activities described in detail in **Section 4.1** (Affected Environment) would continue. DCOR has an approved DPP to operate Platform Gilda and would continue with currently permitted production activities. If WST are not incorporated into DCOR's DPP, production at Platform Gilda would continue to decline and eventually cease. The opportunity to improve hydrocarbon recovery from low-permeability zones by increasing effective reservoir permeability and bypassing near-wellbore formation damage leveraging use of existing infrastructure would be lost.

The No Action alternative would lead to a slow decline in production for a single platform and therefore is unlikely to have a measurable impact in OCS production values as a whole or influence the amount of imported oil. A decline in production would result in avoiding the risks identified and impacts described for the Proposed Action. This alternative would not maximize economically recoverable oil and meet the purpose of this action, which is to increase OCS oil and gas materials for domestic use.

4.4 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVE 3: DEVELOPMENT OF NEW PRODUCTION WELLS

Overall, the impacts associated with Alternative 3 would be similar to those described in the 2018 *Programmatic EA Federally Regulated Offshore Oil and Gas Activities in the Southern California Planning Area* (Argonne National Laboratory 2018). This document analyzes potential impacts of authorizing new applications for well drilling, conductor installation, temporary well abandonment, and other permit-requiring downhole activities at platforms on existing leases on the Pacific OCS. The analysis in this document is incorporated by reference (chapters 3 and 4, pp. 3-1 through 4-30, including Table 4-9, *Summary Comparison of Potential Effects among Alternatives*; Argonne National Laboratory 2018) and summarized here.

Alternative 3 would have more environmental impacts than the Proposed Action. Additional resources required for Alternative 3 would create higher air emissions due to drilling units, support vessels, and associated equipment; increased vessel traffic to support extended drilling operations; and longer overall operational disturbances due to a longer program duration. Additional wells would also generate increased volumes of drilling waste, cuttings, and produced fluids requiring handling, transport, and disposal.

Drilling unit operations would also result in an increase in noise and create potential bird strike hazards; increased vessel traffic would contribute to noise levels and would increase the chance of vessel strikes to marine mammals and sea turtles; seafloor disturbance and possible increases in sedimentation from drilling operations would have local and transient impacts to benthic organisms, fishes, and EFH.

Increases in noise, air emissions, and vessel traffic could also have local and transient impacts on commercial and recreational fishing and local tourism, though these may be modulated by the fact that the platform has been in operation since 1981 and drilling operations would be short term. The drilling of additional wells to maintain production at platform Gilda would continue beneficial local economic impacts associated with platform operations.

5.0 OTHER REQUIRED IMPACT ANALYSIS

516 DM 1 – *U.S. Department of the Interior Handbook of National Environmental Policy Act Implementing Procedures* directs DOI agencies to consider the following categories of impacts described in **Sections 5.1** and **5.2**.

5.1 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The use of WST to enhance recovery of hydrocarbons from Platform Gilda would result in short-term, localized impacts to air quality, water quality, local geology deeper than 4000 feet, and marine mammals from local noise as described in this EIS. Before making a decision about the use of WST, BOEM will consider these impacts and the benefit of enhancing the long-term productivity of the existing platform and reduction of impacts to the environment by using existing oil and gas infrastructure to meet consistent and increasing energy demand in comparison to conducting new oil and gas drilling. For more detail on the trade-off of opting for additional new oil and gas drilling over WST on an existing platform to meet energy demands, see **Section 3** (Alternatives).

5.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF FEDERAL RESOURCES

Irreversible and irretrievable commitment of resources refers to impacts or losses to resources that cannot be reversed or recovered. The federal government's initial decision to develop oil gas resources over a multi-year period offshore southern California took place when the original DPP was approved in 1980. The use of WST considered in this EIS to enhance oil recovery from an existing platform would result in continued or enhanced hydrocarbon production from the platform using existing oil and gas infrastructure and would not require additional commitment of federal resources. However, hydrocarbons recovered from these operations would enter oil and gas markets for consumption and would no longer be available for use.

6.0 CONSULTATION/COORDINATION

6.1 PUBLIC INVOLVEMENT

During the 10-day public scoping period from March 18 to March 30, 2026, BOEM received 50 comments from the public, agencies, and other interested groups and stakeholders (Regulations.gov/docket/BOEM-2025-0714). An additional four comments posted to the public docket are duplicative or not germane. BOEM received an additional eight oral comments from one virtual public comment meeting held on March 24, 2026.

6.1.1 Comment Topics

Scope of Analysis and Topics Covered in EIS

Commenters expressed concern about the risk from oil spills; toxic fluids introduced into the marine environment (leakages); risk to wildlife and overall ecosystem, harm to larvae; high-pressure injection induced earthquakes; and aging offshore infrastructure.

Commenters suggested that if BOEM is working under an energy emergency order, the agency should also include renewable energy development like offshore wind as an alternative in its EIS. Other commenters suggested no oil and gas activities should be considered, only alternative sources. Many commenters urged BOEM to ban fracking in offshore oil and gas operations.

Commenters requested the EIS address: impacts from all exploration, development, and production activities including venting or flaring of gases on air quality; impacts of exploration development and production activities, including drilling fluid discharges, on water quality; potential changes in onshore infrastructure including roads; impacts from oil and gas activities on local tourism, and the impacts of oil spills and cleanup activities. There was also a request for the EIS to outline the water quality studies that would be needed for future production actions.

NEPA Implementation

Commenters expressed concern about the abbreviated timeline/lack of meaningful time for public comment/engagement and asked for a longer comment period and EIS process to consider the impacts of fracking. Another commenter stated that the NOI does not provide the public with a full outline of alternatives.

Other comments referred to the lawsuits against BOEM and BSEE over the sufficiency of the NEPA analysis and biological consultation process.

6.1.2 Response to Comments

Scope of Analysis and Topics Covered in EIS

See **Section 2** (Proposed Action) for a complete description of the Proposed Action: WST. Exploration, production, and development activities, including gas flaring/venting, changes to onshore infrastructure, or other production activities are not proposed and so are not considered in this EIS. See **Section 4.2.1** (Geology and Seismicity) for information about fracking fluid leaks, seismicity, and potential interaction with the water table. See **Section 4.2.2** (Air Quality and Greenhouse Gases) for information on predicted emissions. See **Section 2.3** (Oil Spill Contingencies and Worst-Case Discharge) and **Section 2.10.2** (Well Integrity Monitoring and Safety) for information on infrastructure age and maintenance. See **Section 4.2.3** (Water Quality) for detailed information about water quality impacts related to oil spills and pipeline leaks. See **Section 4.2.4** (Biological Resources) for analysis of impacts to benthic organisms and wildlife. See **Section 2.10.2** (Well Integrity Monitoring and Safety) for information on infrastructure age and maintenance. See **Section 6.2** (Consultation) for information about biological consultations and a clarification addressing BOEM's trust responsibilities to Federally Recognized Tribes outside of this EIS process.

NEPA Implementation

See **Section 1** (Introduction) for information about the lawsuits regarding WST on platform Gilda. See NEPA section 107(c); 42 U.S.C. 4336a(c) and 516 DM -1 *Department of the Interior Handbook of National Environmental Policy Act Implementing Procedures*, for guidance on the contents of an NOI (NOI should include a "preliminary description" of the Proposed Action and alternatives). See the Department of the Interior's "*Alternative Arrangements for Compliance with the National Environmental Policy Act amid the National Energy Emergency*" published April 23, 2025 for information on the types of energy projects included under E.O. 14156, "Declaring a National Energy Emergency".

6.2 CONSULTATION

Tribal Consultation. BOEM invited the Santa Ynez Band of Chumash Indians to participate in government-to-government consultation on the DCOR WST via a letter emailed on February 26, 2026, and invited government-to-government consultation and as a Cooperating Agency on the DCOR WST EIS via email sent on March 17, 2026, and complied with BOEM's tribal policy.

National Marine Fisheries Service (NMFS). Section 7(a)(2) of the ESA (16 U.S.C. 1537) requires that federal agencies shall both "…utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species…" and, "…ensure that any action authorized, funded, or carried out… is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species...which is determined…to be critical…". Because BOEM consulted with NMFS under ESA for Ongoing Oil and Gas Operations within California Area of the Pacific Outer Continental Shelf Region, which included well stimulation treatments (NMFS 2024b), no further consultation is required. As part of that consultation, BOEM agreed to implement measures to monitor the extent of vessel collisions with ESA-listed species. In addition, in accordance with the MMPA, the applicant must determine the need for an Incidental Harassment Authorization (IHA), which allows the incidental take of marine mammals during the specified activities. If the applicant determines the need for an IHA, they must submit an application to NMFS, which, after evaluation, would either authorize incidental take or deny the IHA application.

The Magnuson-Stevens Fishery Conservation and Management Act (as amended) requires federal agencies to consult with NMFS regarding actions that could adversely affect designated EFH. The Proposed Action is not anticipated to adversely affect EFH beyond baseline levels because the base fluid for all treatments will be filtered seawater that is part of an existing permitted system. Existing seawater pumps and the amount of seawater sourced locally from the environment will not be above existing baseline levels drawn within existing system parameters.

U.S. Fish and Wildlife Service (FWS). Section 7(a)(2) of the ESA (16 U.S.C. 1537) requires that federal agencies shall both "…utilize their authorities in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species…" and, "…ensure that any action authorized, funded, or carried out… is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species...which is determined…to be critical…". Since BOEM consulted with FWS under ESA for Existing Outer Continental Shelf Oil and Gas Development and Production Activities in the Southern California Planning Area, which included well stimulation treatments (FWS 2025), no further consultation is required. As part of that consultation, BOEM agreed to reinitiate formal consultation if two California least terns, two light-footed Ridgway's rails, twenty tidewater gobies, two Western snowy plovers, or two marbled murrelets are found dead or wounded. Moreover, the following two reasonable and prudent measures are implemented: 1) BOEM and BSEE must ensure that Oil Spill Response Plans and Marine Wildlife Contingency Plans associated with either (1) BOEM and BSEE's approval of oil and gas development and production plans and plan revisions or (2) approval of applications for permits to drill or modify minimize take of listed wildlife species to the extent practicable; and 2) BOEM and BSEE must ensure that BOEM or BSEE-initiated oil spill response exercises consider the presence of listed species within the exercise area and minimize take of listed wildlife species to the extent practicable.

U.S. Army Corps of Engineers (USACE). USACE possesses jurisdiction by federal law pursuant to Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 403); 33 CFR 320.2(b), Section 10 of the Rivers and Harbors Act. and prohibits the unauthorized obstruction or alteration of any navigable waters of the U.S. The authority of the Secretary of the Army to prevent obstructions to navigation in navigable waters of the U.S. was extended to artificial islands, installations, and other devices on the seabed, to the seaward limit of the OCS, by Section 4(f) of the OCSLA of 1953 as amended (43 U.S.C. 1333(e)). Department of the Army permits are required for the construction of artificial islands, installations, and other devices on the seabed, to the seaward limit of the OCS, pursuant to Section 4(f) of the OCSLA as amended pursuant to 33 CFR 322.3(b). It was determined that the Proposed Action does not require Rivers and Harbors Act Section 10 authorization.

Coastal Zone Management Act (CZMA). On February 26, 2026, BOEM began consultations with the Governor of California, the California Coastal Commission, and the other local California agencies per 30 CFR 550.267, implementing 16 U.S.C. 1456, in relation to the Supplemental DPP submitted by DCOR. Consultation remains underway and is expected to be completed in the second quarter of 2026. BOEM also intends to submit a consistency determination per 15 CFR

930 Subpart C during the second quarter of 2026 in relation to the federal activity of approving WST as required by the 9th Circuit Court of Appeals decision in the case EDC v. BOEM, No. 19-55526 (9th Cir. 2022).

7.0 LIST OF PREPARERS AND REVIEWERS

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