SANTA CLARA UNIT
(PLATFORMS GRACE AND GAIL)
CONDUCTOR CUTTING PROGRAM

SANTA CLARA UNIT
OFFSHORE VENTURA COUNTY

Project No. 2002-5111

Prepared for:

Chevron West Coast Decommissioning Program
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LIST OF ACRONYMS

BOEM	Bureau of Ocean Energy Management
BSEE	Bureau of Safety and Environmental Enforcement
CFR	Code of Federal Regulation
EFH	Essential Fish Habitat
FESA	Federal Endangered Species Act
FWS	U.S. Fish and Wildlife Service
GHG	Greenhouse Gas Emissions
JOFLO	Joint Oil Fisheries Liaison Organization
MBTA	Migratory Bird Treaty Act
MMPA	Marine Mammal Protection Act
MMTCO2e	Million Metric Ton of CO_2 equivalent
MPA	Marine Protected Area
MSDS	Material Safety Data Sheet
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
OCS	Outer Continental Shelf
OCSLA	Outer Continental Shelf Lands Act
OSRO	On-site Spill Response Organization
P&A	Plugging and Abandonment
PM	Particulate Matter
POLA	Port of Los Angeles
POLB	Port of Long Beach
PTO	Permits to Operate
SCU	Santa Clara Unit
TA	Temporary Abandonment
USCG	U.S. Coast Guard
VCACPD	Ventura County Air Pollution Control District
VTSS	Vessel Traffic Separation Scheme

PLATFORMS GRACE AND GAIL CONDUCTOR CUTTING PROGRAM – PROJECT DESCRIPTION

1.0 INTRODUCTION

As part of the Santa Clara Unit (SCU) decommissioning program, Chevron is currently in the process of completing the plugging and temporary abandonment (TA) of existing wells on Platforms Grace and Gail (OCS P-217 and P-0205). This activity is anticipated to be completed in the first quarter 2021 at Platform Grace and the first quarter of 2023 on Platform Gail, respectively. Once the wells have been successfully plugged and the temporary abandonment is performed, Chevron will cut and remove the well conductors at each Platform in accordance with BSEE requirements (30 CFR Part 250.1710-1723). These activities are subject to approval by the Bureau of Safety and Environmental Enforcement (BSEE) and to review under the National Environmental Policy Act (NEPA) under the direction of the Bureau of Ocean Energy Management (BOEM).

1.1 PROJECT TITLE

Santa Clara Unit (Platforms Grace and Gail) Conductor Cutting Program

1.2 PROJECT APPLICANT'S NAME AND ADDRESS

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1.3 PURPOSE AND OBJECTIVES

The purpose of the Project is to remove the conductors at both Platforms Grace and Gail in accordance with BSEE requirements.

1.4 BACKGROUND

The Santa Clara Unit (SCU) facilities are located within Federal Outer Continental Shelf (OCS) waters and include Platforms Grace (OCS P-217) and Gail (OCS P-0205) (Figure 1.4-1). Platform Grace was installed first and became operational in 1980. Platform Gail become operational in 1988. Chevron is responsible for the decommissioning of the platforms, which are currently operated by Beacon West. When these Platforms were active, produced oil and gas was transported from Platform Gail to Platform Grace by subsea pipelines. Produced oil and natural gas were then transported to the onshore separation and treatment facilities in Carpinteria, Santa Barbara County. The Platforms were shut-in in November 2017 following bankruptcy of the previous operator (Venoco). The Venoco bankruptcy resulted in the relinquishment of the leases.

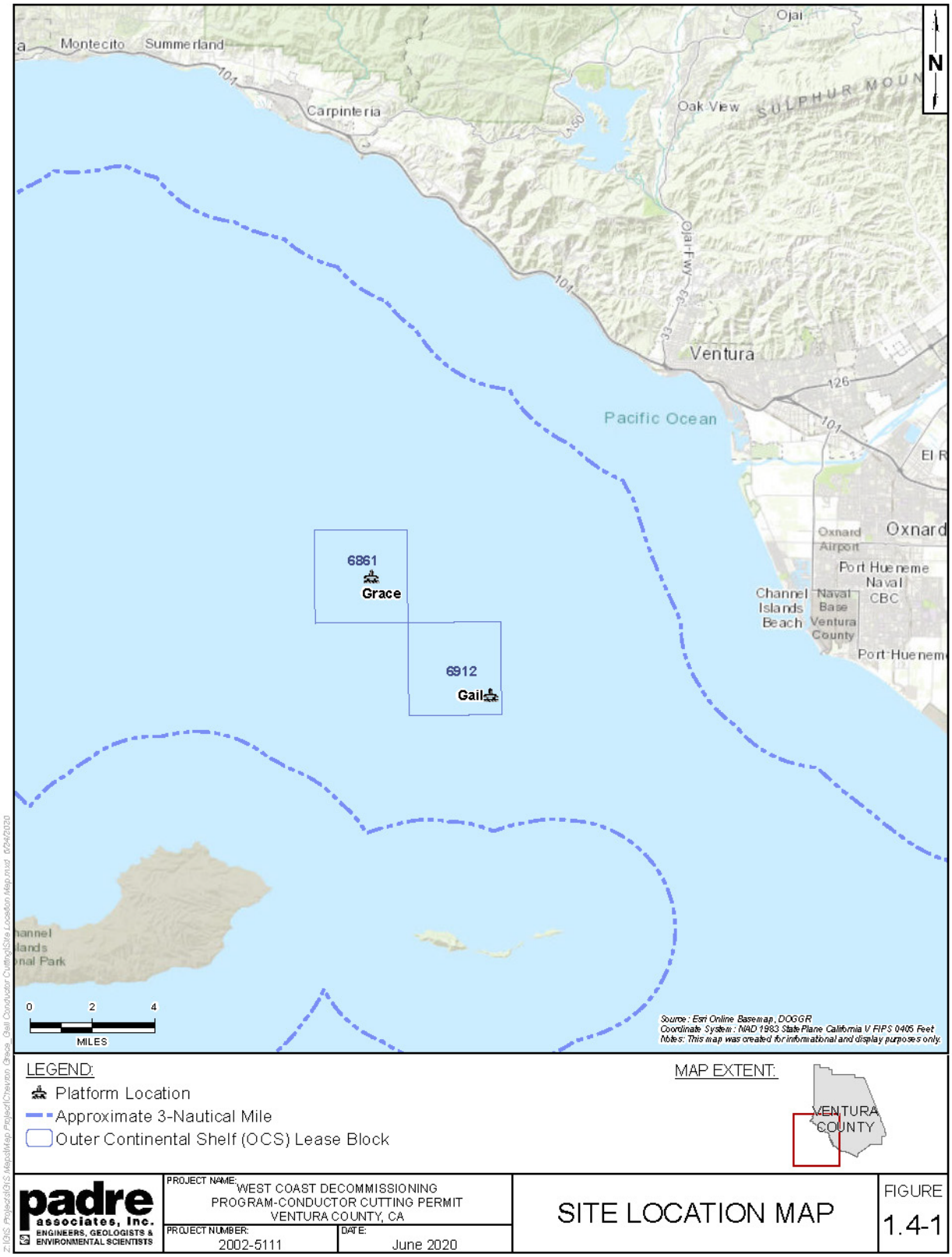


Figure 1.4-1. Site Location Map

1.5 REGULATORY REQUIREMENTS

The decommissioning and removal of the conductors shall follow requirements in the Outer Continental Shelf Lands Act (OCSLA), the National Environmental Policy Act (NEPA), and the regulatory requirements pursuant to BSEE under 30 CFR Part 250.1703 (General Requirements for Decommissioning). A summary of Federal, State, and local regulatory requirements is provided in Table 1.5-1.

Table 1.5-1. Summary of Project Regulatory Requirements

Permitting Agency	Anticipated Approvals/Regulatory Requirements
Federal	
BOEM/BSEE	Outer Continental Shelf Lands Act (OCSLA) Approval of Conductor Cutting Project NEPA analysis Subpart Q of 30 CFR Part 250.1710-1723
U.S. Fish and Wildlife Service	Section 7 Consultation (Federal Endangered Species Act (FESA)
National Marine Fisheries Service	Section 7 Consultation (FESA); Essential Fish Habitat Assessment
State	
California Office of Historic Preservation	National Historic Preservation Act; Section 106 Compliance
Local	
Ventura County Air Pollution Control District	Permit to Operate Nos. 01493 (Grace) and 01494 (Gail)

1.5.1 SCU Permit to Operate

The Santa Clara Unit is currently operating under Ventura County Air Pollution Control District Permit to Operate (PTO) Numbers 01493 for Platform Grace and 01494 for Platform Gail. All well abandonment operations, including conductor removals, are being conducted in accordance with the requirements of the existing PTOs. The PTOs have been evaluated with respect to the proposed conductor cutting activities (see Appendix C for air quality emissions estimates). No modifications to the PTOs will be required to accommodate the conductor cutting Project.

2.0 PROJECT DESCRIPTION AND METHODOLOGY

2.1 DESCRIPTION OF EXISTING PLATFORMS/CONDUCTORS

2.1.1 Platform Grace

Platform Grace is located on Federal Lease OCS-P 0217 and was installed in 1979. First production was in 1980. Platform Grace is located at coordinates (X-1,026.807' and Y-747,437') approximately 10.5-miles from shore in a water depth of approximately 318 feet. There are approximately 48 well slots on Platform Grace (38 well conductors). The Platform is currently shut-in, and the wells are in the process of being plugged and abandoned. The existing Platform configuration currently has four operating decks, a jacket walkway near sea level, crew boat landings, cranes, control room, galley, and personnel accommodations. The support structure of the Platform includes twelve, 42-inch diameter main piles and 8, 48-inch diameter skirt piles. The Platform jacket dimensions are approximately 90' x 145' at the surface and 158' x 213' at the bottom. The total weight of the Platform is 13,074 tons.

Figure 2.1-1. Photograph of Platform Grace

2.1.2 Platform Gail

Platform Gail is located on Federal Lease OCS-P 0205 and was installed in 1987. First production was in 1988. Platform Gail is located at coordinates (X-1,046,650' and Y-726,990') approximately 9.9-miles from shore in a water depth of approximately 739 feet. There are approximately 36 well slots (28 well conductors) on the Platform. The support structure of the Platform includes 8, 60-inch diameter main piles and twelve, 72-inch diameter skirt piles. The Platform jacket dimensions are approximately 70' x 170' at the surface and 197' x 297' at the bottom. The total weight of the Platform is 37,057 tons.

Figure 2.1-2. Photograph of Platform Gail

2.1.3 Seafloor Surveys

A benthic study of the seafloor was conducted by BOEM(RE) for Platforms Grace and Gail as part of the Eastern Santa Barbara Channel study in 2001 (https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Pacific-Region/Studies/2011-010_Technical_Summary.pdf). As indicated in the results

of this study (MMS, 2003), the seafloor around Platform Grace gradually slopes (0.38%) down towards the south. A mound under Platform Grace rises to –305' MLLW, and this 13-foot high mound is centered in the northwest quadrant under the Platform.

The seafloor around Platform Gail has a 3.6% downward slope towards the south-southwest. Several small mounds are present under Platform Gail (ranging from 2 to 3-foot high with bases as wide as 70-feet).

2.1.4 Conductors

2.1.4.1 Platform Grace

Platform Grace has 48 well slots. Of those well slots, twenty-eight, 24-inch conductors were installed and used to support production well drilling operations. An additional ten; 24-inch conductors were installed however no wells were subsequently drilled. Ten well slots remain empty. The total surface area of the conductors as part of the entire Platform jacket structure is approximately 90,108 ft^2. As part of the well plug and abandonment program, the wellheads will be removed, and each well is plugged in accordance with BSEE regulations. Well TA is anticipated to be completed at Platform Grace by the end of the 1st quarter of 2021.

2.1.4.2 Platform Gail

Platform Gail has 36 well slots. Of those well slots, twenty-eight 24-inch conductors were installed and used to support production well drilling operations. Eight well slots remain empty. The total surface area of the conductors as part of the entire Platform jacket structure is approximately 138,808 ft^2. Well TA is anticipated to be completed at Platform Gail by the end of the 1st quarter of 2023.

2.1.4.3 Conductor Summary

Table 2.1-1 provides a summary of well conductors to be removed at each Platform.

Table 2.1-1. Summary of Well Conductors Proposed for Removal

Platform	Conductors to be Removed	Conductor Length (ft)	Total Conductor Length (ft)	Water Depth (ft)	Diameter	Total Weight (tons)
Grace	38	398	14,328	318	24"	130.11
Gail	28	789	22,113	719	24"	261.62

2.2 REMOVAL METHODOLOGY

The current plan is to complete conductor removal in one phase (at each Platform) using either abrasive or mechanical cutting methods. Prior to removal operations, the conductors will be cleaned of marine growth using divers with water jetting tools. Diver operations will be focused on the upper 60 feet of the conductor where the majority of the marine growth is accumulated, however diver operations may continue deeper if conditions warrant it. In addition to diver operations, a water jetting ring will be attached to each conductor below the water line prior to

jacking operations to continue removal of any attached marine growth on the lower sections of the conductor.

The initial cut(s) will be made at a location at least 15 feet below the mudline (or other depth as approved by BSEE) using an Internal Multi-String Cutting Tool (see Appendix A for equipment specification sheet). Abrasive material will be utilized to make the initial cut from inside the conductor and through the outer casing(s) at Platform Grace. The abrasive material will be made up of Sharpshot© Iron Silicate Abrasives (see Appendix B for MSDS specifications sheet). Approximately 500 lbs. of material would be required per hour of use. The average conductor cut requires approximately 7 hours, or approximately 3,500 lbs. of material. Once the initial cut is completed and confirmed, the cut conductor pipe will be pulled up to the Platform deck using a casing jack or hydraulic hoist and then cut into approximately 40 foot segments utilizing a mechanical cutting tool (Figure 2.2-1). Topside cuts will take approximately 3 hours each to complete. Based on an average conductor length at Platform Grace of 398 feet, an additional 9 topside cuts (equivalent to approximately 27 hours of cutting time) would be required following the initial cut below the mudline for removal of each conductor (38 total).

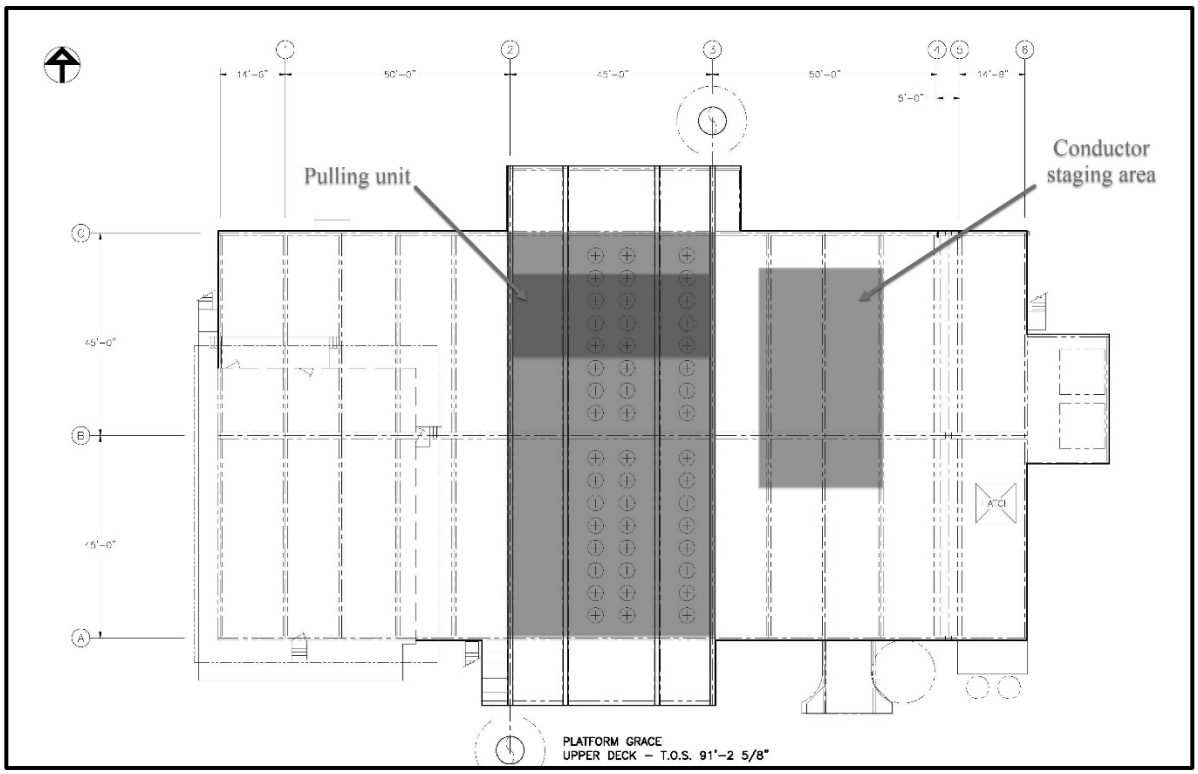
Due to water depths at Platform Gail, mechanical cutting methods may be used to complete the initial conductor cuts (see Appendix A for Abrado SCR-1000TM equipment specifications). Internal cuts typically are completed using a hydraulically actuated cutter head which is rotated inside the conductor. It is estimated that internal mechanical cut(s) would take approximately twelve to twenty-four hours depending on the number of internal strings of pipe that need to be cut. As described above, once the initial cut is completed and confirmed, the cut conductor pipe will be pulled up to the Platform deck using a casing jack or hydraulic hoist and then cut into approximately 40 foot segments utilizing a mechanical cutting tool (Figure 2.2-1). Again, topside cuts will take approximately 3 hours each to complete. Based on an average conductor length at Platform Gail of 789 feet, an additional 19 topside cuts (equivalent to approximately 60 hours of cutting time) would be required following the initial cut below the mudline for removal of each conductor (28 total).

The cut pipe will then be stacked on each Platform deck as shown on Figures 2.2-3 and 2.2-4 and transferred to the OSV *Adele Elise* or similar vessel for transport to a recycling facility as shown in Figure 2.2-2 and further described below. Each segment will take approximately 10 minutes to load onto the vessel utilizing the existing Platform crane(s). Batch sizes will be selected to optimize deck space and minimize vessel runs.

Once all well conductors on Platform Grace are completed in 2021, the Platform equipment and support vessels will be demobilized and will return to complete well conductor removal activities on Platform Gail in 2023.

Figure 2.2-1. Example Cut Conductor Pipe Being Placed on Platform Deck

Figure 2.2-2. Example Cut Conductor Pipe Being Offloaded to Transport Vessel



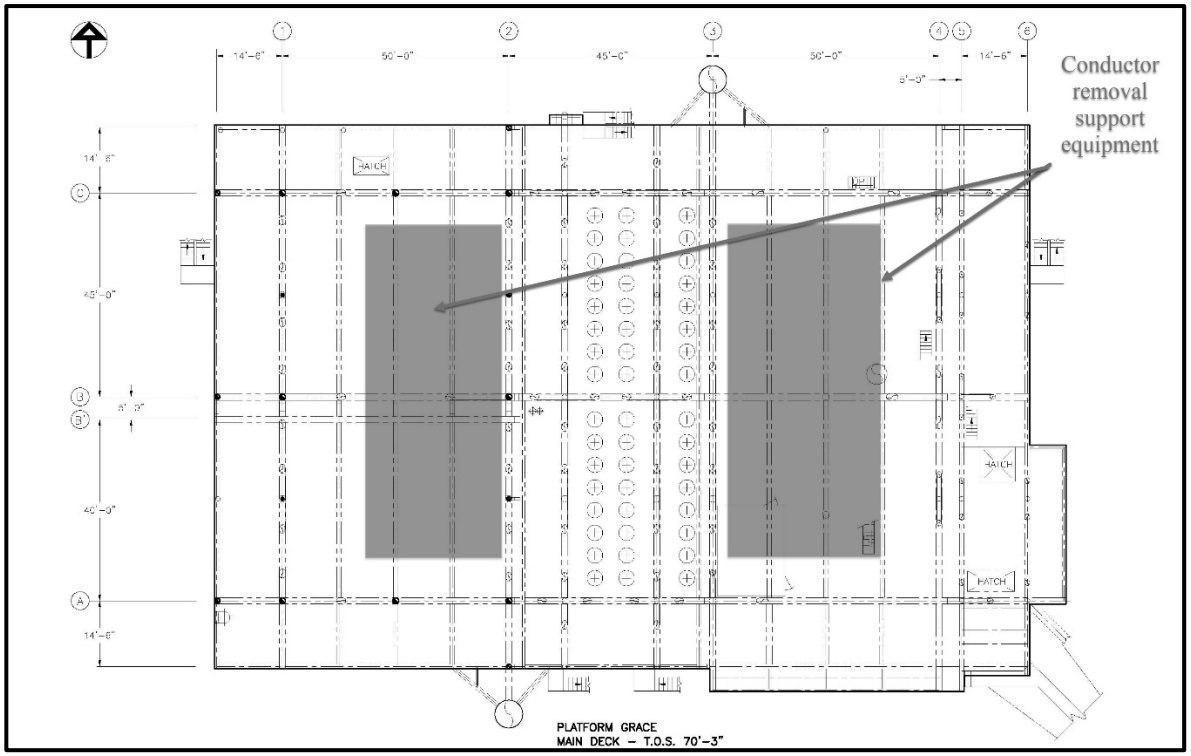


Figure 2.2-3. Platform Grace Proposed Upper and Main Deck Layouts for Conductor Removal Activities

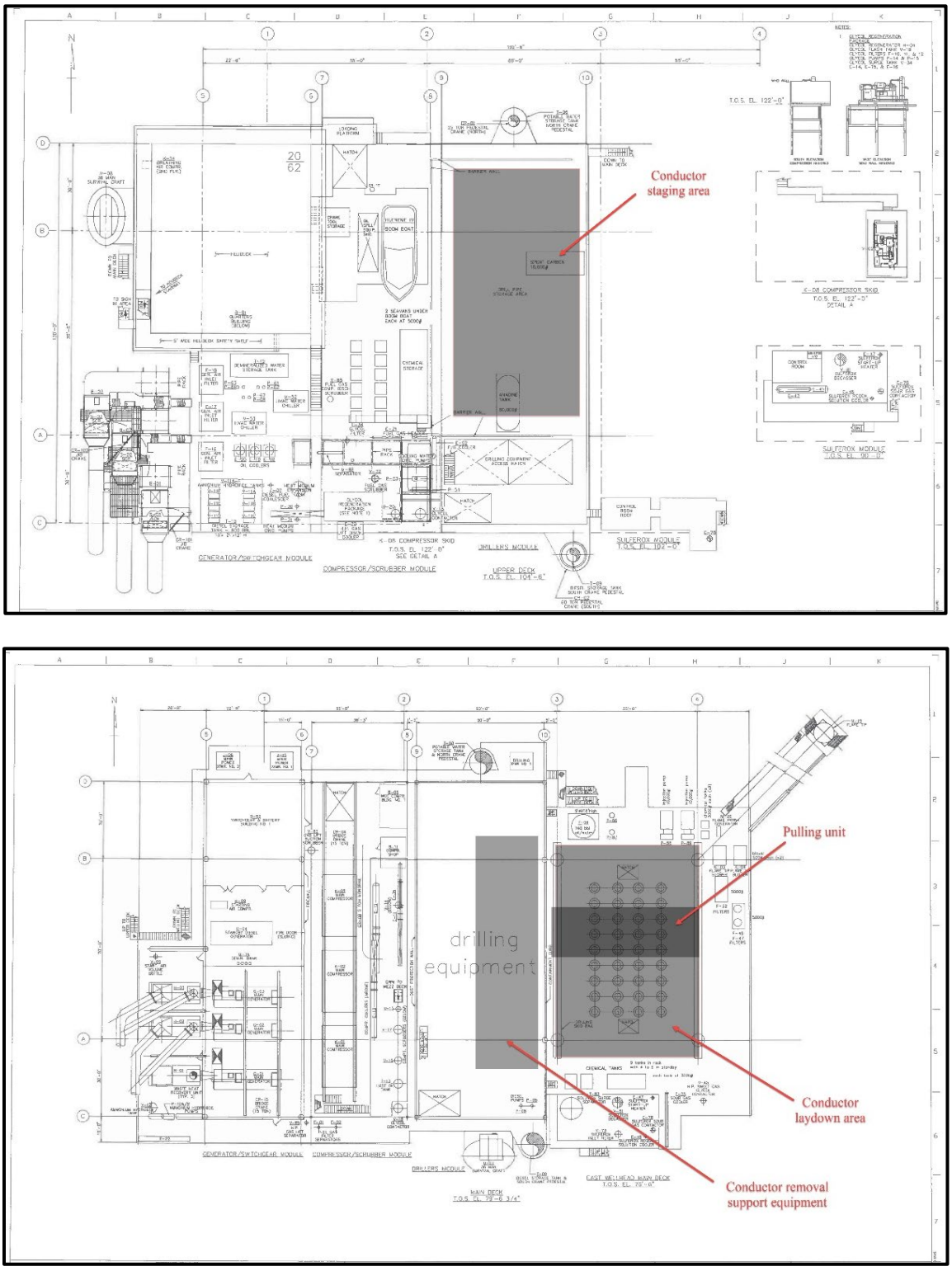


Figure 2.2-4. Platform Gail Proposed Upper and Main Deck Layouts for Conductor Removal Activities

2.2.1 Vessel Requirements

2.2.1.1 Conductor Pipe Transport to Shore

Conductor pipe transport to shore will be conducted using the Offshore Service Vessel (OSV) *Adele Elise* (or equivalent vessel). Transportation of the cut conductor material from Platforms Grace and Gail will be directly by vessel to the POLB or to Port Hueneme; both of which have dock side offloading facilities. The OSV *Adele Elise* is a 225-foot vessel that has large open deck space (Figure 2.2-5). The vessel is powered by 2 main diesel engines. The maximum recorded speed is 10.2 knots.

Figure 2.2-5. OSV Adele Elise

2.2.1.2 Crew Boat/Support Vessel

Crew boats currently transit to/from Carpinteria (Casitas) Pier in support of decommissioning activities on Platforms Grace and Gail. This crew boat (M/V *Jackie C*) will continue to provide transit approximately two times per day during the proposed conductor cutting and removal activities. The M/V *Jackie C* is a 120-foot vessel (Figure 2.2-6). The vessel is powered by 4, MTU Series 60 Engines. The maximum speed is 19 knots.

Figure 2.2-6. M/V Jackie C

2.2.1.3 Anchoring

The OSV *Adele Elise* will be self-positioned during loading and prior to transport to the POLB. If necessary, the *Adele Elise* and *Jackie C* will moor at the mooring cans located at both Platforms while waiting for loading to commence.

2.2.1.4 Offshore Traffic Guidelines

Coastwise Shipping Lanes. The coastwise shipping lanes operate in accordance with a Traffic Separation Scheme (TSS). The TSS is an internationally recognized vessel routing designation that separates opposing flows of vessel traffic into lanes approximately 1 nautical mile (nm) wide, with a zone between lanes approximately 2 nm wide where traffic is to be avoided. The local TSS was established to facilitate the safe movement of ships into and out of the Santa Barbara Channel and the POLA/POLB.

U.S. Coast Guard (USCG). The Project is located within the Eleventh Coast Guard District, which includes all of California and offshore waters. Each USCG District publishes a weekly Local Notice to Mariners (LNM), which is the primary means of providing information pertaining to navigational safety and other items of interest to mariners.

In accordance with 33 CFR Chapter 1, §147.1102 (Platform Grace) and §147.1113 (Platform Gail), the USCG has established a 500-meter safety zone around Platforms Grace and Gail. No vessel may enter or remain in this safety zone except an attending vessel, a vessel under 100 feet in length not engaged in towing, or a vessel authorized by the USCG.

JOFLO. For smaller oil and gas industry vessels using the Santa Barbara Channel, the Joint Oil Fisheries Liaison Office (JOFLO) has established transportation corridors directly from offshore platforms to the onshore ports, harbors and piers from which crew and supplies are conveyed. The purpose of the JOFLO corridors is to provide a safe access route for oil and gas industry vessels in designated corridors as they approach and leave moorings, terminals, crew, supply, and harbor facilities, which reduces the potential for interference with commercial fishing vessels. Although the program is voluntary, a majority of the existing oil and gas vessel traffic to the Project platforms use the JOFLO corridors.

2.2.2 Traffic Routes

POLB/SA Recycling Alternative. Approximately 48 trips will be required to transport recovered conductor material from the Platforms: 16 trips (averaging approximately 1 trip/week) for conductors from Platform Grace and 32 trips (averaging approximately 1 trip/week) for conductors from Platform Gail. It is estimated that the OSV *Adele Elise* will take approximately 10 hours (one way) to transit 100 nm from Platform Grace or 90 nm from Platform Gail to SA Recycling (or equivalent) in the POLB. The vessel will follow the proposed offshore traffic scheme provided in Figure 2.2-7, adhering to the established USCG VTSS. Additionally, the M/V Jackie C crew boat will transit personnel and materials to the Platforms and back to the Carpinteria Pier shore as needed. The proposed offshore traffic scheme has been selected based on existing Joint Oil Fisheries Liaison Office (JOFLO) corridors in order to avoid commercial fishing to the extent feasible.

The conductor pipe will be offloaded at SA Recycling within the POLB for separation and recycling. No further transport would be required.

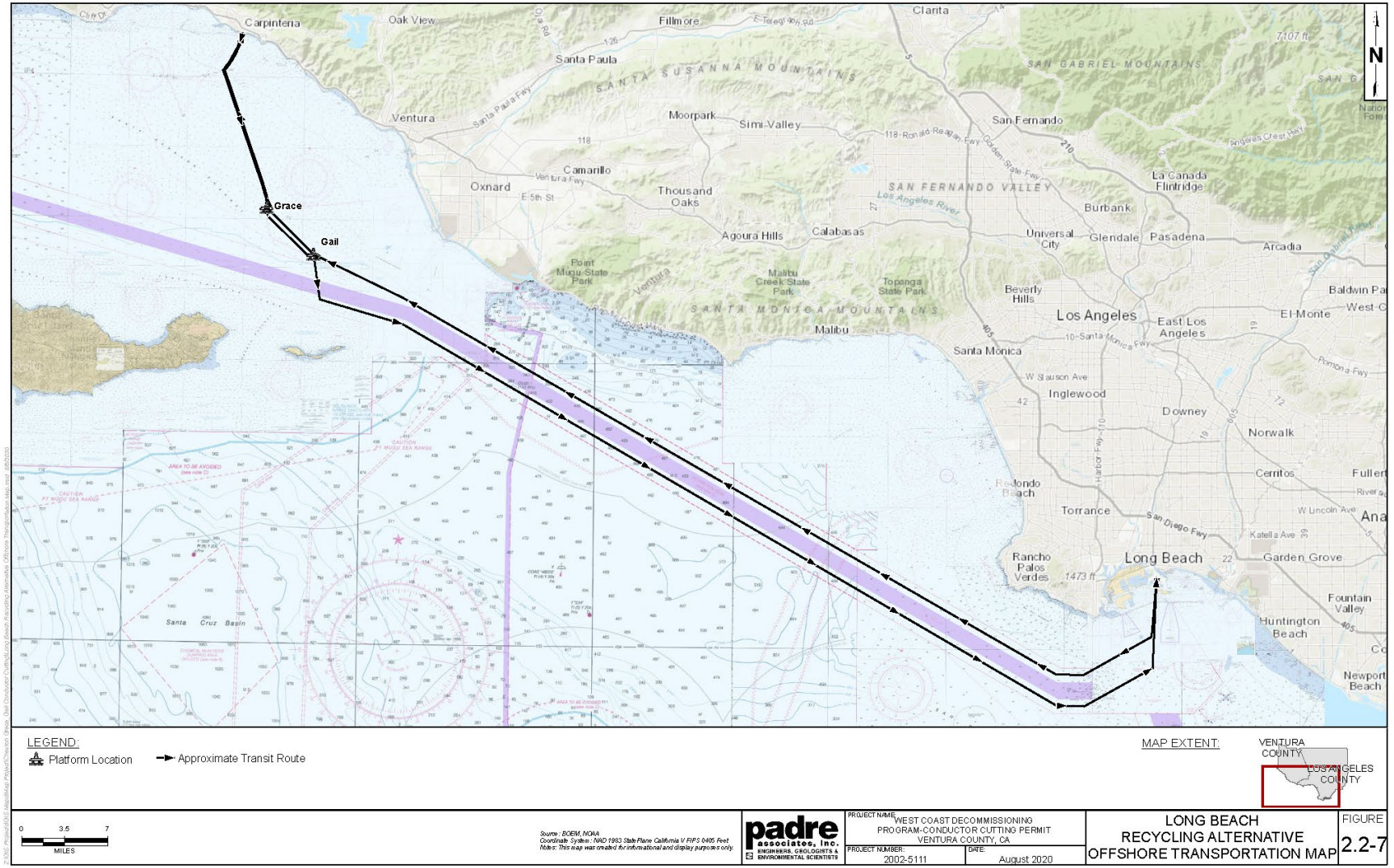


Figure 2.2-7. Long Beach Recycling Alternative Offshore Transportation Map

Port Hueneme/Standard Industries Recycling Alternative. As an alternative to transport to and recycling within the POLB, the OSV *Adele Elise* could alternatively take the cut conductors to Port Hueneme for onshore transit to Standard Industries (or equivalent) in Ventura County, California (Figure 2.2-8). As noted above, approximately 16 vessel trips (averaging approximately 1/week) will be required to transport for conductors from Platform Grace and 32 trips (averaging approximately 1/week) for conductors from Platform Gail. It anticipated that it would take approximately 3 hours (one way) to go 31 nm from Platform Grace or 21 nm from Platform Gail to Port Hueneme. Once offloaded in Port Hueneme, the conductors will be trucked to Standard Industries (or equivalent) located in Saticoy, Ventura County, California for recycling. Standard Industries is located approximately 12.5-miles (or approximately 30 minutes) from Port Hueneme. From Port Hueneme, the most immediate route for hauling would be northward on Victoria Avenue and eastward onto Vineyard Avenue to access the industrial area of Saticoy and Standard Industries. Alternative routing could be northeast on Pleasant Valley Road and northward on Rice Avenue to avoid populated areas or peak traffic conditions.

Based on a maximum single truck weight of 44,000 lbs, it is estimated that approximately 375 truck trips total to Standard Industries (125 for Grace conductors and 250 for Gail conductors) would be required. The maximum truck trips would be 8-10 trips from Port Hueneme to Saticoy resulting from a weekly offload, depending on truck availability and loading/unloading speed. More than likely these trips would be spread over 2 days within the week timeframe.

2.2.3 Disposal Summary

Recovered conductor pipe will be taken to the Port of Long Beach (POLB) or Port Hueneme to be recycled. Grout recovered from the conductors will either be recycled or transported to an approved disposal facility. A summary of anticipated disposal volumes is provided in Table 2.2-1 below:

Table 2.2-1. Platform Conductor Disposal Summary

Product	Grace	Gail
Steel (tons)	1,500	3,300
Grout (tons)	1,300	2,800

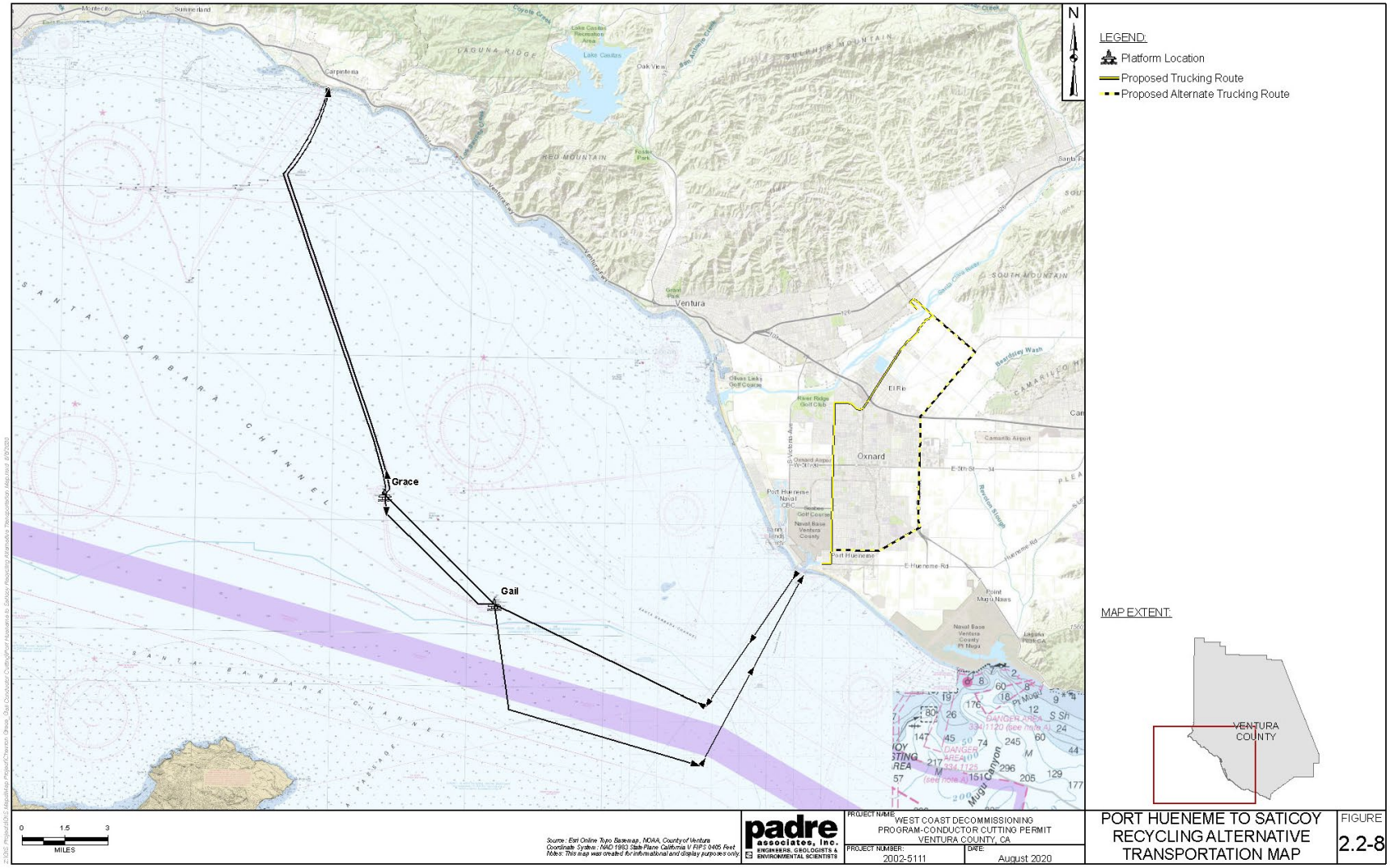


Figure 2.2-8. Port Hueneme to Saticoy Recycling Alternative Transportation Map

2.2.4 Project Personnel and Equipment

2.2.4.1 Equipment Requirements

Table 2.2-2 provides a summary of vessels and equipment to be utilized for the conductor cutting Project:

Table 2.2-2. Vessels and Equipment Summary

Equipment Type	Tier	Quantity	Horsepower	Operating Hours or Days	Days Grace	Days Gail
Cutting and Conductor Removal Activities						
Pulling Unit						
Cummins QSK19	4	1	760	8	90	180
Compressor	-	1	300	8	90	180
CMT Pump (Gail)	3	1	300	24	0	28
Abrasive Water Jet (AWJ)						
High Pressure Water Pump - John Deere Power Tech Plus: 6090HF485	3	1	325	7	28	0
Hydraulic Power Pack - Kubota D1305-E3B	4	1	29.1	7	28	0
Air Compressor	3	1	500	7	28	0
Drill Pin Sever						
HPU	3	1	200	12	90	180
Marine Growth Removal (MGR)						
High Pressure Water Pump - John Deere Power Tech Plus: 6090HF485	3	1	325	8	90	180
Transport and Disposal						
OSV Adele Elise						
Caterpillar Diesel Engines	2	2	2,000 (4,000 total)	24	120	240
Generator – Cummins	2	2	660+755 (1,415 total)	24	120	240
Bow Thruster	2	1	660	24	120	240
Emergency Generator - JDeere	2	1	113	24	120	240
M/V Jackie C						
MTU Series 60 (4)	2	4	600 (2,400 total)	12	120	240
John Deere Generators (2)	3	2	62 (124 total)	12	120	240
Flatbed Trucks (Transport from Port Hueneme – if Utilized)						
Peterbilt Trucks	4	125	425	1	125	250

Note: Assumes Removal of 4 Sections/day During Cutting and Conductor Removal Activities: 3 Hrs to Drill Pin Cut, 2 Hrs Stroke and Laydown, 7 Hrs for Abrasive Initial Cut/24 Hrs for Mechanical Initial Cut.

2.2.4.2 Personnel Requirements

Crew members from California and the Gulf of Mexico will work on the Platform conductor cutting activities. Crew members will be housed on Platform Gail during the Project. Approximately nine personnel will be required to support the conductor cutting activities per shift. Two, twelve-hour shifts will be conducted for a 24-hour workday; therefore 18 personnel will reside on the Platform to rotate this schedule during proposed work activities.

2.2.5 Project Timing/Schedule

The proposed activities, including mobilization and demobilization, are expected to take approximately 360 operational days to complete. Work at Platform Grace would take approximately 120 days (4 months), and removal at Platform Gail would take approximately 240 days (8 months). The conductor cutting and removal is targeted for at Platform Grace in the 3rd quarter of 2021, following completion of well TA (anticipated to be completed by the 1st quarter of 2021) and all required environmental reviews and permitting. Conductor cutting and removal is targeted at Platform Gail in the 2nd-3rd quarter of 2023, following completion of well TA and all required environmental reviews and permitting.

2.3 APPLICANT PROPOSED MEASURES TO REDUCE POTENTIAL IMPACTS

The following Project-incorporated plans and environmental analyses have been conducted on behalf of the Project. Measures included to reduce potential impacts include the following:

- Equipment Specifications: Appendix A
- Air Emissions Calculations: Appendix C
- Biological Assessment (BA): Appendix D
- Essential Fish Habitat Assessment (EFHA): Appendix E

Please refer to Chapter 3.0 (Environmental Assessment) for a discussion of potential impacts from the proposed Project.

3.0 ENVIRONMENTAL ANALYSIS

The following Sections provide environmental setting information for the proposed Project area, identifies potential environmental impacts from the proposed conductor cutting and removal activities, and includes measures that will be implemented as part of the Project to minimize these potential impacts. Resource areas that have the potential to be affected by the proposed conductor cutting activities include the following:

- Air Emissions
- Marine Biological Resources
- Commercial Fishing
- Cultural Resources
- Geology
- Hazardous Materials and Risk of Upset
- Offshore Transportation
- Water Quality

For the purposes of this analysis, the Project area includes Platforms Grace and Gail, as well as the offshore transportation routes from Carpinteria (Casitas) Pier to the offshore Project sites and from the Platforms to the POLB (Ventura to Los Angeles County) or Port Hueneme to Saticoy (Ventura County) for recycling/disposal of recovered materials. Potential impacts associated with the Project are addressed within Sections 3.2.1 through 3.2.8. As demonstrated within the assessment, any short-term impacts to environmental resources that would result from the conductor cutting activities are addressed through implementation of Project-specific as well as routine operational procedures. The only long-term impact is an incremental reduction of biological habitat from removal of the conductor pipes.

3.1 EXISTING ENVIRONMENTAL SETTING

Platforms Grace and Gail are located in Federal waters within the Santa Clara Unit (SCU) approximately 10-10.5 miles offshore Ventura County in the eastern portion of the Santa Barbara Channel (SBC). Water depths in the Project area range significantly from approximately 318 feet at Platform Grace to 719 feet at Platform Gail. In accordance with 40 CFR, part 55; the Platforms are located within the Ventura County Air Pollution Control District boundaries. The Platforms are located away from any State designated Marine Protected Areas (MPAs), as well as the Federally designated Channel Islands National Park and National Marine Sanctuary.

3.2 POTENTIAL IMPACTS OF CONDUCTOR CUTTING PROJECT

3.2.1 Air Quality and Greenhouse Gas Emissions

The offshore Platforms are located within the South-Central Coast Air Basin, which is under the jurisdiction of the Ventura County Air Pollution Control District (VCAPCD). The VCAPCD shares responsibility with the California Air Resources Board (CARB) for ensuring that all ambient air quality standards are attained within the County. The SCU operates under existing Permit to Operate (PTO) Numbers 01493 for Platform Grace and 01494 for Platform Gail. The PTOs establish thresholds for allowable emissions associated with Platform operations (including decommissioning activities).

If the POLB Recycling Alternative is chosen, recovered conductor pipe will be transported by vessel from the Platforms to the POLB, which is in Los Angeles County. Emissions during transit offshore Los Angeles County and within the POLB are within the jurisdiction of the South Coast Air Quality Management District (SCAQMD).

3.2.1.1 Air Quality Standards

Air quality standards are specific pollutant concentration thresholds that are used to protect public health and the public welfare. The USEPA has developed two sets of standards; one to provide an adequate margin of safety to protect human health, and the second to protect the public welfare from any known or anticipated adverse effects. At this time, SO_2 is the only pollutant for which the two standards differ. The California Air Resources Board (CARB) has developed air quality standards for California, which are generally lower in concentration (i.e., more stringent) than federal standards. California standards exist for O_3, CO, suspended PM_{10}, visibility, sulfates, lead, hydrogen sulfide, and vinyl chloride. Table 3.2-1 lists applicable ambient air quality standards.

Table 3.2-1. Ambient Air Quality Standards (State and Federal)

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
Respirable Particulate Matter PM_{10}	Annual Geometric Mean	20 µg/m^3	--
Respirable Particulate Matter PM_{10}	24-Hour	50 µg/m^3	150 µg/m^3
Fine Particulate Matter $PM_{2.5}$	Annual Geometric Mean	12 µg/m^3	12.0 µg/m^3
Fine Particulate Matter $PM_{2.5}$	24-Hour	--	35 µg/m^3
Hydrogen Sulfide (H_2S)	1-Hour	0.03 ppm	--
Vinyl Chloride	24 Hour	0.01 ppm	--
Sulfates	24 Hour	25 µg/m^3	--
Lead	30 Day Average	1.5 µg/m^3	--
Lead	Calendar Quarter	--	1.5 µg/m^3

Pollutant	Averaging Time	California Standard	Federal Standard
Lead	Rolling 3-Month Average	--	0.15 µg/m^3
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.	--

Source: CARB 2020

Air Toxic Health Risks. Diesel fuel combustion in internal combustion engines produces exhaust containing a number of compounds that have been identified as toxic air contaminants (TACs) by CARB. In 1998, CARB identified diesel particulate matter (DPM) from diesel exhaust as a TAC. In 2000, CARB developed the Diesel Risk Reduction Plan to reduce PM and DPM emissions from diesel-fueled engines and vehicles to establish new emission standards, certification programs, and engine retrofit programs to control exhaust emissions from diesel engines and vehicles. CARB has the following diesel enforcement programs and regulations to reduce the smog-forming pollutant and TAC emissions and that may be applicable to the Project:

- Commercial Vehicle Idling. Diesel-fueled motor vehicles with a gross vehicle weight rating greater than 10,000 pounds are prohibited from idling the vehicle's primary engine for more than 5 minutes at any location.
- Heavy Duty Vehicle Inspection Program (HDVIP). The HDVIP program requires heavy-duty trucks and buses to be inspected for excessive smoke, tampering, and engine certification label compliance.
- Software Upgrade for Diesel Trucks. Requires owners of eligible 1993–1998 model year electronically controlled heavy-duty diesel engines to install low NO_x software at the time of an engine rebuild.
- Truck and Bus Regulation. This regulation requires that all trucks and buses be equipped with 2010 or newer model year engines to reduce PM, DPM and NO_x emissions. Starting in 2020, the California Department of Motor Vehicles will only register vehicles that comply with this regulation.
- Strategic Plan for Diesel Enforcement. Assembly Bill (AB) 233 also known as the Healthy Heart and Lung Act (HHLA) enacted in 2007, requires CARB to develop a strategic plan to enforce diesel emission control regulations. HHLA specifically requires CARB, every 3 years, to review existing diesel emission control regulations enforcement and anticipated enforcement needed to implement the Diesel Risk Reduction Plan. Based on that review, CARB is required to develop a Strategic Plan for consistent, comprehensive, and fair enforcement of these regulations. In 2008 CARB issued a notice of postponement for the first Strategic Plan's public review (CARB 2008). No future date for public review has been set and further review by CARB has been postponed (CARB 2020).

3.2.1.2 Commercial Harbor Craft Regulation

In November 2007, CARB approved a Commercial Harbor Craft Regulation to reduce emissions from diesel engines on commercial harbor craft vessels. The regulation requires the following:

- All commercial harbor craft owners and operators are required to fuel diesel engines with California ultralow sulfur diesel and install a non-resettable hour meter on each engine.
- All new commercial harbor craft engines are required to meet the USEPA marine or off-road emissions standard in effect at the time the vessel is acquired.
- All new replacement engines for all in-use harbor craft are required to meet the Tier 2 or Tier 3 marine or off-road standards in effect at the time the engine is acquired.
- Existing Tier 1 or earlier propulsion and auxiliary engines on in-use harbor craft are required to meet USEPA Tier 2 or Tier 3 standards in effect at the time of regulation compliance.

3.2.1.3 VCAPCD Rules and Regulations

The following VCAPCD rules and regulations are applicable to the Project:

- Rule 50 - Opacity: This rule sets the opacity standards for the discharge of visible air contaminants.
- Rule 51 – Nuisance: Rule 51 indicates that no air contaminants shall be discharged that would cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endangers the comfort, repose, health or safety of any such persons or the public or which would cause injury or damage to business or property.
- Rule 55 – Fugitive Dust: This rule sets the requirements of fugitive dust generators. The provisions of this rule shall apply to any operation that would result in disturbed surface area, or a human-made condition capable of generating fugitive dust, including bulk material handling, earth-moving, construction, demolition, storage piles, unpaved roads, track-out, or off-field agricultural operations.
- Rule 62.7 – Asbestos Demolition and Renovation: This rule sets the requirements for any demolition and renovations activities.
- Rule 64 – Sulfur Content of Fuels: This rule sets the sulfur content requirements for gaseous and liquid fuels used in any combustion source. Ocean vessels are exempted.

Thresholds of Significance. The VCAPCD's 2003 Air Quality Assessment Guidelines include adopted significance thresholds for NOX and ROGs for long-term project (operational) emissions of 25 pounds (lbs) per day of NOx and ROGs (VCAPCD, 2003). The Project would be a short-term decommissioning project and would not have an operational phase; therefore, the thresholds of significance do not apply. However, a project that is inconsistent with the Air

Quality Management Plan is considered to have a significant cumulative adverse air quality impact (VCAPCD 2003).

3.2.1.4 Los Angeles County (POLB/South Coast AQMD) Rules and Regulations

Port of Los Angeles (POLA) No Net Increase Report (June 2005). The Port of Los Angeles/Port of Long Beach (POLA/POLB) complex is the fifth busiest container port in the world, and approximately 40 percent of all the nation's import cargo passes through these two ports (No Net Increase Task Force, 2005). Due to concern over the effects of air emissions on the public, and on the local communities of San Pedro and Wilmington, which are immediately adjacent to the POLA, the Los Angeles Board of Harbor Commissioners established a policy that there would be "no net increase in air emissions" from POLA activities over October 2001 levels.

SCAQMD AQMP (2016). The SCAQMD's AQMP proposed control measures are based on implementing all feasible control measures through the accelerated deployment of available cleaner technologies, best management practices, co-benefits from existing programs, and incentive measures (SCAQMD, 2017). The AQMP details emissions occurring in the SCAQMD during the base year 2012 and attainment demonstration years of 2019, 2022, 2023, 2025, and 2031. The future emission forecasts are based on demographic and economic growth projections provided by the SCAG. Even without any additional controls, VOC and NO_x emissions are expected to decrease due to existing regulations, such as controls on off-road equipment, new vehicle standards, and the Regional Clean Air Incentives Market (RECLAIM) programs (SCAQMD, 2017).

SCAQMD Rule 402 - Nuisance. This rule prohibits discharge of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any such persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property.

San Pedro Bay Ports Clean Air Action Plan (CAAP). The 2006 CAAP was created with the cooperation and participation of the SCAQMD, CARB and U.S. EPA. The goal of the 2006 CAAP was to improve air quality in the SCAB by adopting the CAAP. The 2006 CAPP was a sweeping plan aimed at significantly reducing the health risks posed by air pollution from port-related ships, trains, trucks, terminal equipment, and harbor craft (CAAP, 2017). The CAAP was updated in 2010 to provide near-term planning through 2014 and establishing long-term goals. Currently, a 2017 CAPP Update is in the draft process to provide even more strategies and emission-reduction targets to cut emissions from sources operating in and around the Ports, setting the Ports firmly on the path toward zero-emissions goods movement (CAPP, 2017).

POLB/POLA Vessel Speed Reduction (VSR) Program. The VSR program has been in place since 2001 under which vessels slow to 12 knots when they are within 20 nautical miles (nm) of Point Fermin. The POLA, EPA, CARB, SCAQMD, the Pacific Merchant Shipping Association (PMSA), and the Marine Exchange of Southern California signed a memorandum of understanding to voluntarily reduce the speed of ocean going vessels (OGV) to 12 knots or less within 20 nautical miles of Point Fermin. Reduction in speed demands less power on the main engine, which in turn reduces fuel usage and emissions. In 2008, the POLA adopted a VSR Incentive Program for OGVs and expanded the program out to 40 nautical miles from Point

Fermin. Compliance with the voluntary VSR program has steadily increased over the years since it was originally adopted.

Port of Long Beach (POLB) Green Port Policy. In November 2004, the Board of Harbor Commissioners (BHC) directed the POLB to develop a policy that would build on the existing Healthy Harbor program to encompass wide ranging environmental goals. In January 2005, the BHC adopted the Green Port Policy, which serves as a guide for decision making and established a framework for environmentally friendly Port operations. The goal of the air quality program element of the POLB Green Port Policy is to reduce harmful air emissions from Port activities (POLB, 2005).

SCAQMD Emissions Thresholds. Table 3.2-2 provides a summary of daily maximum emissions thresholds in the SCAQMD for construction activities:

Table 3.2-2. SCAQMD Daily Maximum Emissions Thresholds for Construction

SCAQMD Daily Maximum Emission Threshold	Pounds per Peak Day				
	NO_x	ROG	PM_{10}	CO	SO_2
	100	75	150	550	150

3.2.1.5 Estimated Project Emissions (Criteria Pollutants)

The Project is a temporary decommissioning project that does not have an operations phase. Estimated Project emissions for criteria pollutants are provided in Table 3.2-3 below. Within Ventura County for the Port of Long Beach Recycling Alternative, emissions within Ventura County in 2021 are estimated at 265.11 peak pounds of NOx/day/5.11 total tons of NOx for Platform Grace and 246.51 peak pounds of NOx/day/8.94 total tons of NOx for Platform Gail in 2023. Estimated emissions for the Port Hueneme to Saticoy Recycling Alternative in Ventura County are estimated at 206.56 peak pounds of NOx/day/4.16 total tons of NOx for Platform Grace and 189.86 peak pounds of NOx/day/7.11 total tons of NOx for Platform Gail in 2023. However, the VCAPCD only requires emissions for long-term projects to be below the 25 pounds/day threshold for any one pollutant (NO_x and ROG), therefore criteria pollutant emissions during construction are not applicable.

For the POLB Recycling Alternative, Project activities would generate 718.48 peak pounds of NOx/day within the SCAQMD boundaries total, however approximately 359.24 peak pounds/day of NOx would be generated in 2021 and 359.24 peak pounds/day of NOx in 2023.

All well abandonment operations, including conductor removals, are being conducted in accordance with the requirements of existing PTOs. The PTOs have been evaluated with respect to the proposed conductor cutting activities (see Table 3.2-3 and Appendix C for air quality emissions estimates). No modifications to the PTOs will be required to accommodate the conductor cutting Project.

Table 3.2-3. Estimated Criteria Pollutant Project Emissions

DISPOSAL OPTION	*Ventura County*					*Los Angeles County*				
	NO_X	**ROG**	**PM_{10}**	**SOx**	**CO**	**NO_X**	**ROG**	**PM_{10}**	**SOx**	**CO**
Port of Long Beach Recycling Alternative										
Platform Grace (Peak Day lbs)	265.11	43.18	27.31	0.33	151.92	359.24	45.33	43.62	0.21	158.24
Platform Gail (Peak Day lbs)	246.51	43.78	23.91	0.40	147.74	359.24	45.33	43.62	0.21	158.24
TOTAL	**511.62**	**86.96**	**51.22**	**0.74**	**299.66**	**718.48**	**90.67**	**87.24**	**0.43**	**316.47**
Platform Grace (Total Tons-2021)	5.11	0.93	0.46	0.01	3.58	5.75	0.73	0.70	0.00	2.53
Platform Gail (Total Tons-2023)	8.94	1.66	0.78	0.01	6.53	11.50	1.45	1.40	0.01	5.06
TOTAL	**14.05**	**2.58**	**1.25**	**0.02**	**10.11**	**17.24**	**2.18**	**2.09**	**0.01**	**7.60**
Port Hueneme to Saticoy Recycling Alternative										
Platform Grace (Peak Day lbs)	206.56	35.64	20.03	0.30	125.61	--	--	--	--	--
Platform Gail (Peak Day lbs)	189.86	36.55	16.95	0.38	122.53	--	--	--	--	--
TOTAL	**396.43**	**72.19**	**36.98**	**0.68**	**248.14**	--	--	--	--	--
Platform Grace (Total Tons-2021)	4.16	0.80	0.35	0.01	3.16	--	--	--	--	--
Platform Gail (Total Tons-2023)	7.11	1.43	0.56	0.01	5.72	--	--	--	--	--
TOTAL	**11.27**	**2.23**	**0.91**	**0.02**	**8.88**	--	--	--	--	--

Notes: Only one Recycling Alternative would be chosen. Work at Platform Grace would occur in 2021 and work at Platform Gail would occur in 2023.
See Appendix C and Project Description for Assumptions Re: Distance and Vessel Hours/Trips
Only the POLB Recycling Alternative requires vessel trips within SCAQMD

3.2.1.6 Greenhouse Gas Emissions

Various entities address Greenhouse Gas (GHG) emissions at the state and regional levels. For example, CARB's Climate Change Scoping Plan (2008) establishes GHG reduction strategies and goals for California's future, focusing on large contributors to state GHG emissions (e.g., power generation and transportation). Assembly Bill (AB) 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a statewide GHG emissions cap. It requires that statewide GHG emissions be reduced to 1990 levels by 2020. In 2008 and 2014, CARB approved the Scoping Plan and the first update to the Scoping Plan, respectively. In 2016, the California Legislature passed Senate Bill (SB) 32, which established a 2030 GHG emissions reduction target of 40 percent below 1990 levels. In response to SB 32 and the companion legislation of AB 197, CARB approved the 2017 Scoping Plan Update: The Strategy for Achieving California's 2030 GHG Target in November 2017. The 2017 Scoping Plan draws from the previous plans to present strategies to reaching California's 2030 GHG reduction target.

Given the global nature of climate change resulting from GHG emissions, GHG emission impacts are inherently cumulative in nature. The determination whether a project's GHG emissions impacts are significant depends on whether emissions would be a cumulatively considerable contribution to the significant cumulative impact. At the local level, the VCAPCD and SCAQMD (applicable only to the POLB Recycling Alternative) are the agencies primarily responsible for air quality standards attainment as established by CARB and USEPA. However, the VCAPCD has not approved a GHG significance threshold for construction or operational emissions. The SCAQMD's interim operational emissions significance threshold is 10,000 metric tons of CO_2 equivalent per year ($MTCO_2e/yr$). For the purposes of this analysis, the SCAQMD's GHG Threshold was applied.

As shown in Table 3.2-4, based on the projected GHG emissions, offshore and onshore Project activities would emit approximately 960.20 tons of $MTCO_2e/yr$ in Ventura and Los Angeles Counties combined for the POLB Recycling Alternative in 2021, and approximately 1,828.02 tons of $MTCO_2e/yr$ in Ventura and Los Angeles Counties combined for the POLB Recycling Alternative in 2023. Total Project GHG emissions in Ventura County would be 1,751.81 $MTCO_2e/yr$ and 1,036.41 $MTCO_2e/yr$ in Los Angeles County.

For the Port Hueneme to Saticoy Recycling Alternative, estimated GHG emissions would be 559.81 $MTCO_2e/yr$ in 2021 and 1,032.32 $MTCO_2e/yr$ in 2023. Total Project GHG emissions would be 1,592.13 $MTCO_2e/yr$.

Both recycling alternatives are well below the SCAQMD threshold of 10,000 $MTCO_2e/yr$, especially given that conductor cutting and removal activities at Platform Grace would be conducted in 2021 and at Platform Gail in 2023.

Table 3.2-4. Estimated GHG Total Project Emissions

Disposal Option	*Ventura County*				*Los Angeles County*			
	CO2 (Tons/ Year)	N2O (Tons/ Year)	CH4 (Tons/ Year)	CO2e (Annual)	CO2 (Tons/ Year)	N2O (Tons/ Year)	CH4 (Tons/ Year)	CO2e (Annual)
Port of Long Beach Recycling Alternative								
Platform Grace (2021)	612.72	0.02	0.00	614.73	344.34	0.01	0.00	345.47
Platform Gail (2023)	1,133.35	0.05	0.01	1,137.08	688.68	0.03	0.01	690.94
TOTAL EMISSIONS	**1,746.07**	**0.07**	**0.01**	**1,751.81**	**1,033.01**	**0.04**	**0.01**	**1,036.41**
Port Hueneme to Saticoy Recycling Alternative								
Platform Grace (2021)	557.86	0.02	0.00	559.81	--	--	--	--
Platform Gail (2023)	1,028.74	0.04	0.01	1,032.32	--	--	--	--
TOTAL EMISSIONS	**1,586.60**	**0.06**	**0.01**	**1,592.13**	--	--	--	--

Although the Project would not result GHG emissions over the established SCAQMD threshold, the following measures have been incorporated into the Project design and will be implemented during Project during construction to minimize potential impacts from air emissions:

Measures to Reduce Potential Impacts:

- Conductor cutting and removal activities will be conducted in accordance with Bureau of Safety and Environmental Enforcement (BSEE) Requirements (30 CFR Part 250.1710-1723) for decommissioning activities associated with the existing operational plans at Platforms Grace and Gail.
- Conductor cutting and removal activities have been scheduled in one phase at each Platform to minimize Project timing and associated impacts.

3.2.2 Marine Biological Resources

Platforms Grace and Gail are located within the Santa Barbara Channel. Biological resources and habitats in the vicinity of the Platforms and the Santa Barbara Channel have been documented by a number of recent studies. The findings of these studies relevant to biological resources within the Project area are summarized below. Additionally, please refer to Appendix D for the Project's Federal Biological Assessment (BA) and Appendix E for the Essential Fish Habitat Assessment (EFHA).

3.2.2.1 Surface to Midwater Platform Habitats

At the water's surface, the Platforms' jackets provide an artificial habitat that acts as infrastructure for the attachments of typical shallow, rocky reef invertebrate and fish species. Love et al. (2019) found that the white anemone, *Metridium farcimen,* was by far the most commonly observed cnidarian and comprises 97.6 percent of all invertebrates found on the Platform jackets. The gorgonian and soft corals (alcyonacean, *Leptogorgia chilensis* and the scleractinian, *Lophelia pertusa*), are the most commonly occurring corals near the surface and in midwater depths. Corals are usually found along the crossbeams where they are more protected from currents and swell, opposed to the shear vertical faces of the outer piling supports. Vase sponges are the most commonly found sponges along the Platform structures and are found in mid- to deep water ranges between 266 and 1,194 ft (81 and 365 m) (Love et al., 2019).

Fish densities can be variable between Platforms but tend to be lowest in the shallower depth strata, between 0 to 100 ft (0 to 30 m) and increase with depth. Midwater habitats serve as nursery grounds for a range of rockfish species including blue (*Sebastes mystinus*), squarespot (*S. hopkinsi*) and widow rockfish (*S. entomelas*) and bocaccio (*S. paucispinis*) (Love et al., 2012). In years with sufficient recruitment, young-of-the-year (YOY) rockfish can occur in substantial numbers around the surface and midwater depths. The Platforms' presence provides an opportunity for larval fish to settle out into a complex yet suitable habitat that provides refuge from predators and strong currents, as well as attracts a sufficient prey base. Other species that occur include nearshore reef species such as garibaldi (*Hypsypops rubicundus*), blacksmith (*Chromis punctipinnis*), cabezon (*Scorpaenichthys marmoratus*), sheephead (*Semicossyphus pulcher*), and white and sharpnose perches (*Morone americana* and *Phanerodon atripes,* respectively) (Love et al., 2012).

3.2.2.2 Deep-Water and Benthic Platform Habitats

The seafloor around both Platform Grace and Gail is sedimentary, comprised of medium to fine grain sand and silts (MEC Analytical Systems, 2003, Fugro West, 2003 and 2005). The deep-water platform structure and surrounding seafloor support diverse populations of benthic invertebrate and fish species; however, existing conditions at each Platform differ slightly due to differences in water depth at each location.

The softbottom benthic community surrounding the Platforms are comprised of polychaete worms, amphipod crustaceans, bivalve mollusks, and echinoderms. However, there are species specific differences and variations in species diversity that characterized the benthic communities within different water depths. As the Platforms' structures rise out of the softbottom habitats, they provide an artificial hardbottom habitat which provides attachment sites for sessile invertebrates such as mussels, corals, bryozoans, and sponges (Argonne National Laboratory, 2019).

Platform bottoms vary greatly in fish assemblage composition, primarily due to differences in bottom depth; however, the bottom structures and benthic habitat are more commonly characterized by subadult and adult rockfish in contrast to the YOY fish that congregate near the midwater and surface water depths. It is hypothesized that some of the midwater YOY descend to the Platform bottoms or settle out directly from planktonic phase to the platform bottom where they mature (Love and Nishimoto, 2012).

The bottom of each Platform is comprised of vertical and horizontal supports; however, unlike the midwater structure, the bottom habitat contains both the structural elements and a seafloor that is covered with fallen marine fouling organisms. In some areas, the bottom crossbeam is undercut or covered over, provided a greater or lesser "cave-like" habitat that is not found in the midwaters. In addition, this deep-water habitat consists of random, small crevices and other refuge unique to the bottom habitats (Love and Nishimoto, 2012). The unique benthic habitat and fish resources conditions for each platform are presented below.

Platform Grace. The seafloor under Platform Grace is almost flat with a gradual slope toward the south. Historic removal and deposition of fouling organisms on the seafloor has created mid- to low-relief habitat comprised primarily of fragments of mussel shells (*Mytilus* sp.). This habitat area under the Platform measures approximately 78,000 square feet (ft^2) (7,246 square meters [m^2]) on the northwest side of the Platform footprint and is approximately 13 ft (4 m) tall. This area has a volume of approximately 5,500 cubic yards (4,205 cubic meters) (MEC Analytical Systems, 2001 and 2003).

Platform Grace is found on the continental shelf transition zone where infaunal communities are dominated by the spionid, capitellid, and chaetopterid polychaetes, tellinid bivalves, ostracods, and ophiuroid echinoderms (Gillett et al., 2013; Argonne National Laboratory, 2019). Fish species found in the deep-water habitat of the Platform's legs include widow, calico, vermillion, and halfbanded rockfish (*S. entomelas*, *S. dalli*, *S. miniatus*, and *S. semicinctus*, respectively). The sharpnose surfperch is also commonly observed within the deeper portion of Platform Grace. Love (2003) reported that two species, halfbanded rockfish and shiner surfperch (*Cymatogaster aggregatta*), accounted for 86.5 percent of the total fish observed on the seafloor shell talus area at Platform Grace throughout the six-year study. YOY and juvenile boccaccio rockfish (*S. paucispinis*), a once depleted species that has subsequently recovered as a stock, were relatively abundant in the mid- and bottom-depth areas of Platform Grace during the 1999 and 2000 surveys (Love, et al., 2003). Fish species observed along the exposed habitat comprised of shell fragments and transition areas to the soft sediment bottom include sanddabs (*Citharichtys spp.*), halfbanded rockfish, and other unidentified perch and juvenile rockfish (Crystal Energy, 2006).

Platform Gail. The seafloor around Platform Gail is also primarily sedimentary; however, the shell fragments that have accumulated beneath the Platform are lower relief and smaller area than around Platform Grace. MEC Analytical (2003) estimated that there are four identifiable areas of low relief under Platform Gail which are approximately two to three feet tall, the largest of which measures 40 by 60 ft (12 to 18 m) at its base. The total volume of the four areas under Platform Gail was estimated to be less than 500 cubic yards.

Platform Gail is located in an upper slope, deep water benthic zone where the species diversity is limited and is primarily comprised of tellinid bivalves and the spionid polychaete (Gillett et al., 2013). Platform Gail hosts a different suite of fish species around its deep-water habitat,

including bocaccio, cowcod (*Sebastes levis),* another federally managed species experiencing a stock recovery, pinkrose (*S. simulator*), and greenblotched (*S. rosenblatti*) rockfishes. Love and Nishimoto (2012) reported that the assemblage of fish known to occupy the lower-relief shell fragment habitat is composed of 1) juvenile fishes of larger species and juveniles and adults of dwarf species that utilize small sheltering sites (i.e., juvenile cowcod and lingcod [*Ophiodon elongatus*], blackeye goby (*Rhinogobiops nicholsii*), and calico rockfish [*S. dallii*]), 2) ecotonal species that favor soft sea floor-low, hard-relief bottom (greenstriped [*S. elongatus*] and stripetail [*S. saxicola*] rockfishes), and 3) a few schooling taxa (notably halfbanded rockfish) that are habitat generalists.

3.2.2.3 Essential Fish Habitat

The Project Platforms are located in an area where managed groundfish species, as well as foraging or migrating coastal pelagic species and highly migratory species are present. Federal regulations recognize three Habitat Areas of Particular Concern (HAPCs): Rock reefs, canopy kelps, and seagrass beds. The water depth and distance from shore preclude the presence of both canopy kelp and seagrass beds HAPCs in the area around the platforms. In addition, geophysical surveys have not identified any deep-water rocky reef habitats that would qualify as HAPC within the Project area.

Regardless, NMFS and BOEM (2019) recognize that oil and gas platforms may serve as an artificial structure that can enhance the survivorship of juvenile rockfish. While offshore platforms are not designated HAPC, surveys demonstrate that high concentrations of groundfish have been observed in association with these platforms. Studies have found that rockfish are the dominant group of fish around offshore platforms and can comprise between 83 and 89 percent of the total fish diversity (Love et al., 2010 and 2012). Within the midwater nurseries of offshore Platforms, densities of young rockfish have been found to be higher than around most natural reefs (Love et al., 2012). In addition, several species that were formerly listed by California Department of Fish and Wildlife (CDFW) (i.e., bocaccio and cowcod) are found in all life stages from the midwater to bottom of the Platforms' structures. Please refer to Appendix E (EFHA) for further details.

3.2.2.4 Marine Birds

Over 2.5 million seabirds may pass through or reside in the Southern California Bight at any one time. The population fluctuates seasonally because the region is located along the Pacific flyway, which is a major migratory route for all bird species that travel from the northwestern United States, Canada, and Alaska to southern California and Central America. A portion of the Pacific Flyway is located off the coast of California, but the exact location can vary depending on weather. Coastal and marine birds tend to fly at elevations between 100 and 200 feet (60.9 meters) above the ocean (Aspen, 2008).

Few species remain in the area throughout the year since most are non-breeding transients. There is a variety of marine bird species that inhabit or migrate through the open waters of the Project area. The highest at-sea densities are reported to occur near the Channel Islands in January and lowest in the southwest portion of the Southern California Bight (Argonne National Laboratory, 2019). Migrating birds are known to use offshore platforms for nighttime roosting; however, it appears that the birds' association with the structures has more to do with

the availability of roosting habitat in open water than it does with the lighting on the platforms (Argonne National Laboratory, 2019).

Pelagic seabirds generally occur over deeper offshore waters of the Project area. Common pelagic species in the Project vicinity include the Northern fulmar (*Fulmarus glacialis*), sooty shearwater (*Ardenna grisea*), black-vented shearwater (*Puffinus opisthomelas)*, pink-footed shearwater (*P. creatopus*), leach's storm-petrel (*Oceanodroma leucorhoa*), brown pelican (*Pelecanus occidentalis*), cormorants (*Phalacrocorax* spp.), red phalarope (*Phalaropus fulicaria*), red-necked phalarope (*P. lobatus*), and the common murre (*Uria aalge*). Although pelagic species are generally present throughout the year, their abundance varies seasonally. For example, the sooty shearwater and pink-footed shearwaters are most abundant during summer months (Argonne National Laboratory, 2019). Other pelagic migratory species are most numerous from mid-April to early June and from mid-August to mid-October.

The Channel Islands provide nesting and feeding habitat for 99 percent of the breeding birds in Southern California and important wintering areas and rest-stops for shore birds. Several State and Federally listed special status birds utilize the Channel Island within the Project region for breeding, including the bald eagle (*Haliaeetus leucocephalus*), which was delisted in 2007, but is afforded protection under the Bald and Golden Eagle Protection Act. Prior to delisting, bald eagles were successfully introduced on several Channel Islands including Anacapa and Santa Cruz Islands, which are located between 7 and 10 miles (mi) (12 to 17 kilometers [km]), respectively, from Platform Gail (Argonne National Laboratory, 2019). In addition, the Channel Islands provide nesting habitat for approximately 20 seabird species in Southern California. Seabird species that can be found breeding on the Channel Islands in clue red-necked phalarope and Scripp's and/or Guadalupe Murrelets (*Synthliboramphus scrippsi* and/or *S. hypoleucus)* (Santa Cruz Island), Brandt's cormorant (*Phalacrocorax penicillatus*), pink-footed and sooty shearwater, and western gull (*Larus occidentalis*) (San Miguel Island), and brown pelican and Cassin's Auklet (*Ptychoramphus aleuticus)* (Anacapa Island) (Argonne National Laboratory, 2019).

The mainland coastal beaches, tidal marshes, and wetlands also provide nesting and foraging habitat for shorebirds, waders, and coastal raptors. Most shorebirds and waders inhabit tidal wetlands and rocky shorelines outside of the Project area. Shorebirds and waders that are known to breed along the Southern California coast include black oystercatcher (*Haematopus bachmani*), black-necked stilt (*Himantopus mexicanus*), American avocet (*Recurvirostra americana*), killdeer (*Charadrius melodus*), the federally threatened Western snowy plover (*Charadrius nivosus nivosus*), and the federally endangered California least tern (*Sterna antillarum browni*).

Western snowy plovers breed along the sandy beaches of the mainland and offshore Channel Islands between Marsh through September. The snowy plover is also a year-round resident of Santa Rosa Island and a summer resident Santa Cruz Island. California least terns establish nesting colonies on sandy soils with little vegetation as well, along the ocean, lagoons, and bays, where they forage by plunge-diving for small fish. Western snowy plover and California least terns both have established breeding colonies at Hollywood and Ormond Beaches, Oxnard, California, which are the closest nesting areas to the Project Platforms and approximately 10 mi (18 km) west of the Project area (Frost, 2017; USFWS, 2007).

Coastal raptors prey on fish, birds, and in some cases carrion (e.g., washed up carcasses of dead dolphins). Raptor species occurring along the coast include the bald eagle, peregrine falcon (*Falco peregrinus*), osprey (*Pandion haliaetus*), turkey vulture (*Cathartes aura*), Northern harrier (*Circus hudsonius*), and red-tailed hawk (*Buteo jamaicensis*) which are known to nest in the upland wooded, grassland or ruderal habitats adjacent to the coast.

Several bird species that have the potential to occur within the Project area have been afforded protected status by the State and/or Federal government due to declining populations and/or habitats. Table 3.2-5 lists the special-status marine bird species that have the potential to be present within the vicinity of the proposed activities.

Table 3.2-5. Special-Status Bird Species within Project Area

Common Name	Scientific Name	Status Code(s)[a]
Brant	*Branta bernicla*	BMC, SSC
Marbled murrelet	*Brachyramphus marmoratus*	FT, BMC, SE
Scripp's murrelet	*Synthliboramphus scrippsi*	BCC, BMC, ST
Guadalupe murrelet	*Synthliboramphus hypoleucus*	BCC, BMC, ST
Cassin's auklet	*Ptychoramphus aleuticus*	BCC, BMC, SSC
Rhinoceros auklet	*Cerorhinca monocerata*	WL
Tufted puffin	*Fratercula cirrhata*	SSC
California gull	*Larus californicus*	WL
California least tern	*Sternula antillarum browni*	FE, BMC, SE
Gull-billed tern	*Gelochelidon nilotica*	BCC, BMC, SSE
Elegant tern	*Thalasseus elegans*	WL
Black skimmer	*Rynchops niger*	BCC, BMC, SSC
Black-footed albatross	*Phoebastria nigripes*	BCC, BMC
Short-tailed albatross	*Phoebastria albatrus*	FE, BMC, SSC
Ashy storm-petrel	*Oceanodroma homochroa*	BCC, BMC, SSC
Black storm-petrel	*Oceanodroma melania*	SSC
Pink-footed shearwater	*Ardenna creatopus*	BCC, BMC
Black-vented shearwater	*Puffinus opisthomelas*	BCC, BMC
Double-crested cormorant	*Phalacrocorax auritus*	BMC, WL
Brown pelican	*Pelecanus occidentalis*	DL, FP

[a] Status codes: BCC = USFWS bird of conservation concern; BMC =USFWS bird of management concern, DL = delisted (formerly endangered); FE = federally endangered; FT = federally threatened; SE = state endangered; ST = state threatened; FP = state fully protected; SSC = CDFW species of special concern; WL = watch list

Source: Argonne National Laboratory, 2019

3.2.2.5 Marine Mammals

All marine mammals are protected under the 1972 Marine Mammal Protection Act (MMPA), and all sea turtles in U.S. waters are listed under the Federal Endangered Species Act (FESA). These laws are overseen by the National Marine Fisheries Service (NMFS). Baleen whales, toothed whales (including dolphins), sea lions (including the California sea lion [*Zalophus californianus]*), harbor seals (such as the Pacific harbor seal [*Phoca vitulina richardsi*]), fur seal (such as the federally endangered Guadalupe fur seal [*Arctocephalus townsendi*]) could occur in the Project area. California sea lions utilize the Platform loading decks as haul-out areas year-round. In addition, common dolphins (*Delphinus* sp.) are known to migrate through the Project area, sometimes daily, as they move between foraging grounds near the coast.

Disturbing, harassing, injuring, or killing a protected species is prohibited by the MMPA. Table 3.2-6 lists species and their estimated abundance that could be encountered by Project vessels transiting between Carpinteria, Port of Long Beach, and the Project sites. Table 3.2-7 details marine wildlife occurrences and distribution in southern California. Where seasonal differences occur, individuals may also be found within the area during the off-season and, depending on the species, the numbers of abundant animals present in their off-season may be greater than the numbers of less common animals in their on-season.

As mentioned above, California sealions frequently utilize platform loading decks as haul-outs, but there are no documented sea lion rookeries on the Project Platforms. As shown on Figure 3.2-1, 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 56 mi (91 km) from Platform Grace. 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 150 seals annually and is located approximately 14 mi (23 km) north of Platform Grace (Carpinteria Seal Watch, 2020). There are no rookeries in the Project; however, Anacapa Island, approximately 8 mi (13 km) south west of Platform Gail hosts several Pacific harbor seal haul-outs and California sea lion rookeries.

Although rarely encountered, marine turtles occur within waters off the southern California coast, and could potentially occur within the Project area. The four listed sea turtles that may occur within the Project area include the endangered Leatherback turtle (*Dermochelys coriacea*) and Loggerhead turtle (*Caretta caretta*), and the threatened Green turtle (*Chelonia mydas*) and Olive Ridley turtle (*Lepidochelys olivacea*). Populations of marine turtles have been greatly reduced due to over harvesting and loss of nesting sites in coastal areas. Sea turtles breed at sea and the females return to their natal beaches to lay their eggs; however, sea turtles do not nest anywhere along the California coast. In Southern California, coastal power plants discharge warm water that attract and maintain two known colonies of green sea turtles: In San Diego Bay and in Orange County near the San Gabriel River (Argonne National Laboratory, 2019). Although several occurrences of sea turtles have been documented off the southern California coast, the likelihood of their occurrence in the Project site is considered low.

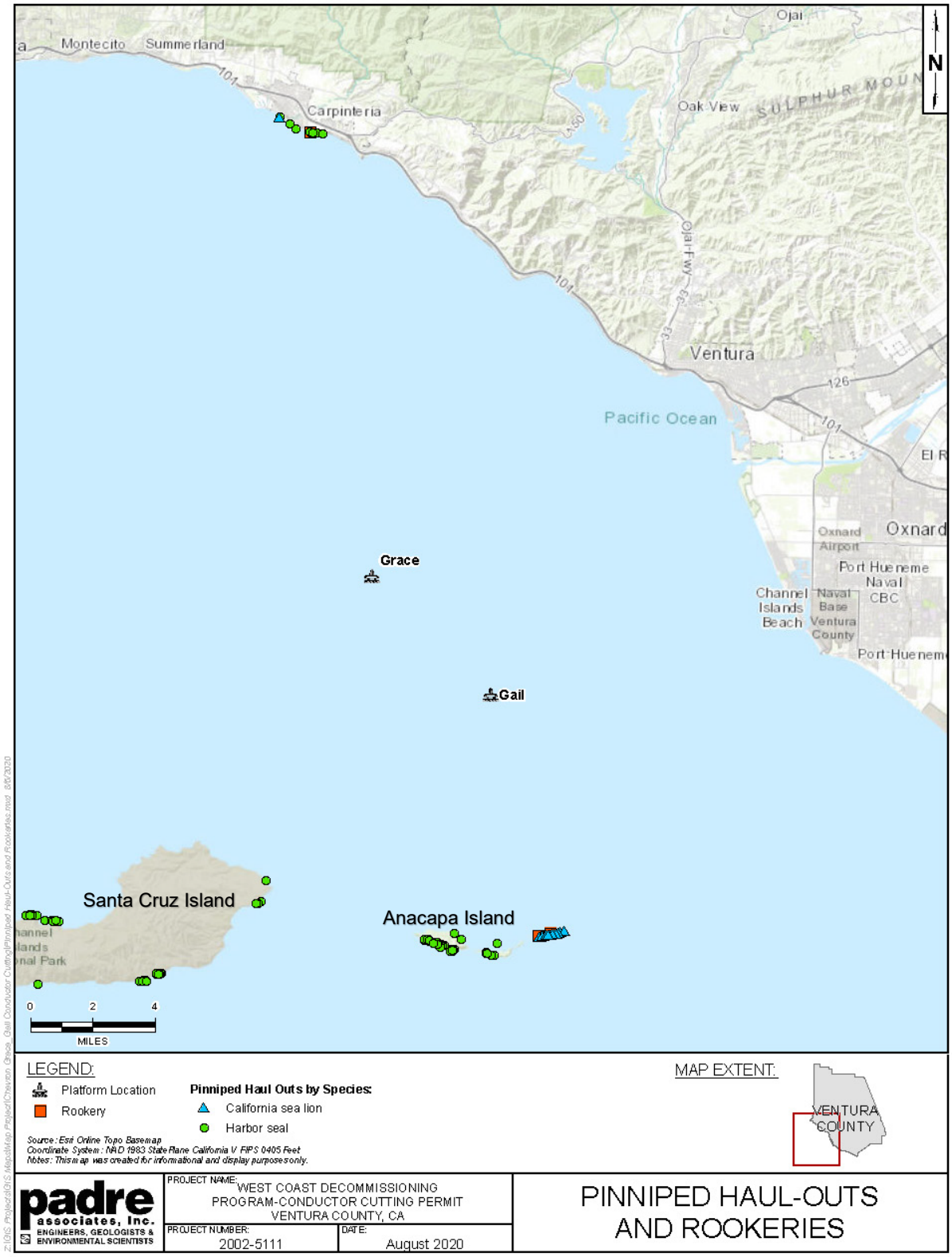


Figure 3.2-1. Pinniped Haul-Outs and Rookeries

Table 3.2-6. Marine Wildlife Species of the Central California Coast

Common Name *Scientific Name*	Minimum Population Estimate (Stock)	Current Population Trend
REPTILES		
Cryptodira*		
Green turtle *Chelonia mydas*	3,319 to 3,479 (Eastern Pacific Stock)	Increasing
Leatherback turtle *Dermochelys coriacea*	961 (Eastern Pacific)	Decreasing
Loggerhead turtle *Caretta caretta*	7,138 (California)	Decreasing
Olive Ridley turtle *Lepidochelys olivacea*	1.15 to 1.62 million (Eastern Tropical Pacific)	Increasing
MAMMALS		
Mysticeti		
Blue whale *Balaenoptera musculus*	1,551 (Eastern North Pacific)	Stable
California gray whale *Eschrichtius robustus*	25,849 (Eastern North Pacific)	Increasing
Fin whale *Balaenoptera physalus*	8,127 (California/Oregon/Washington)	Increasing
Humpback whale *Megaptera novaeangliae*	2,784 (California/Oregon/Washington)	Increasing
Minke whale *Balaenoptera acutorostrata*	369 (California/Oregon/Washington)	No long-term trend suggested
Northern Pacific right whale *Eubalaena japonica*	31 (Eastern North Pacific)	No long-term trend suggested
Sei whale *Balaenoptera borealis*	374 (Eastern North Pacific)	No long-term trend suggested
Odontoceti		
Baird's beaked whale *Berardius bairdii*	1,633 (California/Oregon/Washington)	No long-term trend suggested
Common bottlenose dolphin *Tursiops truncatus*	1,255 (California/Oregon/Washington Offshore)	No long-term trend suggested
	346 (California Coastal)	No long-term trend suggested
Cuvier's beaked whale *Ziphius cavirostris*	2,059 (California/Oregon/Washington)	Decreasing
Dall's porpoise *Phocoenoides dalli*	17,954 (California/Oregon/Washington)	Unable to determine
Dwarf sperm whale *Kogia sima*	Unknown (California/Oregon/Washington)	No long-term trend suggested
Killer whale *Orcinus orca*	77 (Eastern North Pacific Southern Resident)	Decreasing
	276 (Offshore California/Oregon/Washington)	Unable to determine
Long-beaked common dolphin *Delphinus capensis*	68,432 (CA)	Unable to determine
Mesoplodont beaked whales	1,967 (California/Oregon/Washington)	Decreasing

Common Name *Scientific Name*	Minimum Population Estimate (Stock)	Current Population Trend
Northern right whale dolphin *Lissodelphis borealis*	18,608 (California/Oregon/Washington)	No long-term trend suggested
Pacific white-sided dolphin *Lagenorhynchus obliquidens*	21,195 (California/Oregon/Washington Northern and Southern)	No long-term trend suggested
Pygmy sperm whale *Kogia breviceps*	1,924 (California/Oregon/Washington)	No long-term trend suggested
Risso's dolphin *Grampus griseus*	4,817 (California/Oregon/Washington)	No long-term trend suggested
Short-beaked common dolphin *Delphinus delphis*	839,325 (California/Oregon/Washington)	Unable to determine
Short-finned pilot whale *Globicephala macrorhynchus*	466 (California/Oregon/Washington)	No long-term trend suggested
Sperm whale *Physeter macrocephalus*	1,270 (California/Oregon/Washington)	No long-term trend suggested
Striped dolphin *Stenella coeruleoalba*	24,782 (California/Oregon/Washington)	No long-term trend suggested
Pinnipedia		
California sea lion *Zalophus californianus*	233,515 (U.S.)	Increasing
Guadalupe fur seal *Arctocephalus townsendi*	15,830 (Mexico; Undetermined in California)	Increasing
Northern fur seal *Callorhinus ursinus*	7,524 (California)	Increasing
Pacific harbor seal *Phoca vitulina richardsi*	27,348 (California)	Increasing

Sources: National Marine Fisheries Service (NMFS) Stock Assessment Reports by Species 2016 through 2018

Notes:

* Estimates are based on number of current numbers of nesting females.

Table 3.2-7. Marine Wildlife Species within California and Periods of Occurrence

Family / Common Name	Month of Occurrence (1) J	F	M	A	M	J	J	A	S	O	N	D
Mysticeti												
California gray whale												
Blue whale (E)												
Fin whale (E)												
Humpback whale (E)												
Minke whale												
Sei whale (E)												
Northern right whale (E)												
Odontoceti												
Dall's porpoise												
Short-beaked common dolphin												
Long-beaked common dolphin												
Pacific white-sided dolphin												
Risso's dolphin												
Short-finned pilot whale												
Bottlenose dolphin												
Northern right whale dolphin												
Sperm whale (E)												
Dwarf sperm whale												
Pygmy sperm whale												
Baird's beaked whale												
Cuvier's beaked whale												
Mesoplodont beaked whales												
Killer whale (E)												
Pinnipedia												
Guadalupe fur seal (T)												
Northern fur seal												
California sea lion												
Northern elephant seal(4)												
Pacific harbor seal												

Rare with uniform distribution	Not expected to occur	More likely to occur due to seasonal distribution	Present Year Round

Notes:

(E) Federally listed endangered species.

(T) Federally listed threatened species.

(1) Where seasonal differences occur, individuals may also be found in the "off" season. Also, depending on the species, the numbers of abundant animals present in their "off" season may be greater than the numbers of less common animals in their "on" season.

(2) Rarely encountered, but may be present year-round. Greatest abundance during July through September.

(3) Only a small percent occur over continental shelf (except near San Miguel rookery, May-November).

(4) Common near land during winter breeding season and spring molting season.

3.2.2.6 Marine Protected Areas (MPAs)

The California Marine Life Protection Act was established to protect the natural diversity and abundance of marine life and marine ecosystems in California. Three types of MPAs are designated (or recognized) in California: State Marine Reserves (SMRs), State Marine Parks, and State Marine Conservation Areas. Activities associated with the Project would be restricted to Platforms Grace and Gail as well as their respective offshore transportation corridors. As shown in Figure 3.2-2, the closest State MPA to the proposed activities is the Scorpion SMR located approximately 6.8 southwest of Platform Grace and the Anacapa Island SMR, which is located approximately 4.2 miles south of Platform Gail.

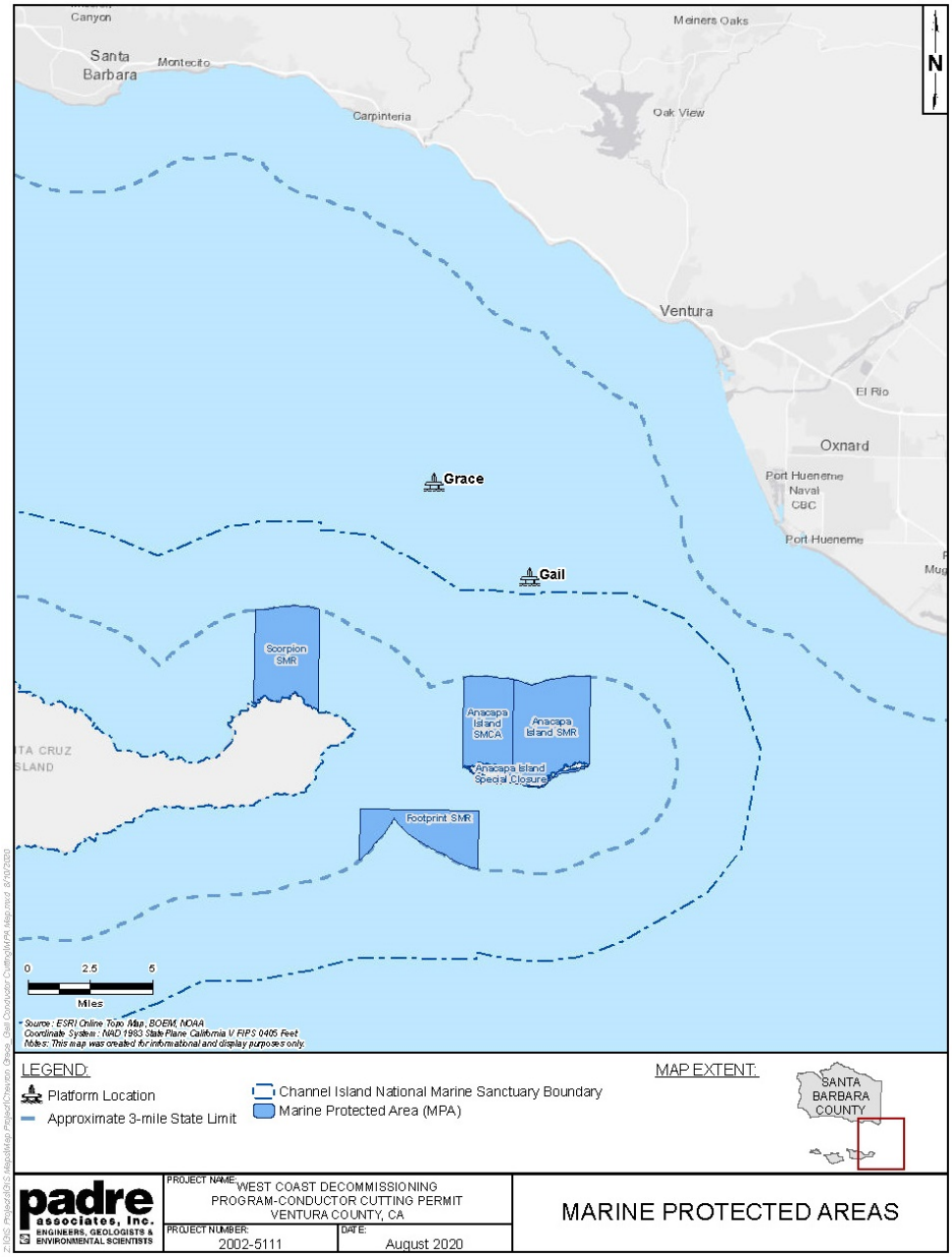


Figure 3.2-2. Marine Protected Areas Near the Project Sites

3.2.2.7 Impact Assessment

Potential impacts due to Project activities includes seafloor disturbance and loss of habitat structure during conductor removal, potential increase in underwater noise, potential vessel strikes, and degradation of water quality or seafloor habitats from the discharge of petroleum in the event of an accidental spill from Project vessels. Potential impacts are described below.

Seafloor Disturbance. The cutting and subsequent removal of conductors from each platform has the potential to create localized turbidity and affect nearby soft-bottomed seafloor habitat beneath the platform. These potential impacts include:

- The removal of marine growth prior to the conductor cutting;
- The increase in sediment suspension and potential subsurface discharge following cutting of the conductor with either abrasive or mechanical equipment; and
- The subsequent void and infill of the seafloor depression as the conductor is lifted from the seafloor.

Prior to removal, the external conductor surface will be cleaned of naturally occurring marine growth. As epibiota is detached from each conductor it will fall to the seafloor. For the duration of the Platforms' production operations, BSEE regulations required operations of offshore platforms to clear marine growth from shallow, submerged portions of the Platforms on a regular basis to reduce structure fatigue. Over time, this removed growth accumulates on the seafloor beneath the Platforms. The cleaning process is anticipated to result in some increased turbidity as these materials fall through the water column and again as it reaches the seafloor. The suspended materials will rapidly disperse once the cleaning operation is completed. The resulting material added to the seafloor beneath the Platform is anticipated to contribute to benthic habitat that has been shown as a favored substrate for many juvenile rockfishes (Meyer-Gutbrod et al., 2019) and may contribute to a short-term increase in food availability within the water column. Detached marine growth in the water column has the potential to attract secondary and tertiary consumers; however, marine growth removal will occur prior to conductor cutting activities and is not expected to negatively impact marine wildlife that maybe foraging or migrating in the Project area.

During conductor cutting operations, there is the potential for the subsurface (15 feet below the mudline) discharge of cutting fluid (i.e., seawater, abrasive materials, steel cuttings) that may cause a short-term disturbance of the sediment around the conductor. As the conductor is pulled towards the surface, there is also the potential for minor amounts of cutting fluid to drift out of the cut site. These discharges will occur intermittently throughout the duration of the Project (120 days at Platform Grace in 2021 and 240 days at Platform Gail in 2023). Turbidity in the water column will increase as the conductor is pulled to the surface, however; due to the 15-foot-deep cutting depth, this majority of cutting fluid will be buried beneath seafloor and disturbance is expected to be minimal.

Potential impacts could also occur as the conductors are pulled from the seafloor and expose the 15-foot-deep footprint of the cut conductor. As natural sediments move to fill the void, suspended sediments will create turbidity that would reduce water clarity and increase sediment deposition. This disturbance would also be localized and short-term, as water conditions and seafloor topography would be expected to return to natural conditions following Project

completion. There are no recorded rocky reefs within the Project area; therefore, there will be no disturbance to these sensitive habitats. However, the seafloor disturbances described above have the potential to temporarily displace benthic invertebrate and fish species. Mobile invertebrates and fish species are expected to relocate away from the conductor footprint during cutting and removal activities. It is expected that a percentage of sessile species, such as deep-water anemones, polychaete worms, and bivalves, in the immediate conductor footprint would experience mortality once the conductor is pulled toward the surface. This impact will be very localized, and the area is expected to infill and recolonize with the benthic taxa following Project completion.

Loss of Habitat Structure. Chevron will remove 38 conductors from Platform Grace and 28 conductors from Platform Gail. Removal of the conductor pipes will reduce the surface area of artificial hard substrate by 26 percent for Platform Grace and 17 percent for Platform Gail. The reduction in surface area and complexity has the potential to relocate the fish and invertebrate populations that utilize the area within the conductor footprint to other areas within and around the platform structure.

The removal of the conductors will result in a permanent decrease in available vertical structure and complexity of artificial habitat available within the water column. This reduction is only a small percentage of the existing structure present within the Platform jackets. Removal of the conductors would not result in an adverse effect to regional populations of managed groundfish species.

Noise During Conductor Cutting. During conductor cutting there is the potential for an intermittent increase in underwater noise with the highest potential noise source being at seafloor where the subsurface cutting noise may reverberate through the sedimentary substrate and the conductor string. Abrasive cutting techniques for the initial cut(s) are anticipated to take approximately seven hours per conductor. Mechanical cutting techniques for initial cuts are anticipated to take approximately 12 to 24 hours per conductor, depending on the number of internal strings of pipe that need to be cut. However, in comparison to the use of explosives, the proposed methodology utilizing Iron Silicate Abrasives and/or mechanical cutting methods within the conductors' interior, will significantly reduce the potential underwater noise levels associated with the Project.

Although there are no studies that evaluate noise associated with the use of subsurface abrasive cutting or internal mechanical methods, previous conductor cutting projects have utilized the noise characteristics of diamond wire cutting in conductor removal operations as a surrogate for the anticipated underwater noise levels (BOEM, 2020, Pangerc et al. 2017). BOEM (2020) cited the diamond wire abrasive cutting has an in-water sound source level of 154 decibels (dB) re 1 microPascal (µPa) at one meter from the sound source. This study determined that the noise generated from diamond wire cutting are not easily discernible above the background noise (i.e., vessel and operations noise). Noise generated during Project conductor cutting will be dampened by the 15-feet of sediments above the cut; therefore, received sound levels are expected to be lower than those created during in-water abrasive diamond wire cutting.

As such, noise levels are not expected to be of high enough energy to cause pathological or physiological effects to marine wildlife; however, there is the potential for temporary behavioral changes in the form of avoidance of the deeper water within Project area. Behavioral effects include changes in the distribution, migration, and reproduction behaviors of exposed animals,

but are only considered biological significant if the changes in behavior affect growth, survival, and/or reproduction.

Increase in noise levels are expected to be detectable near the seafloor, however, it is not expected the surface water noise levels would be affected by conductor cutting. Nosie levels at the surface will be similar to historic operating levels including vessel activity and general noise from on-going Platform operations. Wildlife that utilize the surface waters, specifically diving birds, dolphin species, and resident sea lions, are not expected to experience high noise levels or display any changes in behavior. Additionally, considering the intermittent nature of the well conductor cutting events at the platforms, as well as the overall reduced spatial and temporal overlap with large marine mammals and sea turtle species during these activities, it is anticipated that noise associated with the proposed action will have negligible effects on marine wildlife (Argonne National Lab, 2019).

Project Lighting. The lighting required to conduct Project activities on a 24/7 schedule will be the same as the existing operations lighting on the Project Platforms. Adverse effects to migrating birds due to the lights on offshore platforms appear to be an infrequent occurrence (Johnson et al., 2011). Interactions between the observed migrating birds and the Platforms appear to be due more to the general patterns of migration rather than platform location or design (Johnson et al., 2011).

The Project Platforms will continue to direct all lighting downward and toward the active working deck to reduce light pollution and any adverse effects to marine wildlife. The Platforms will also continue to follow all navigational safety requirements in accordance with the U.S. Coast Guard (USCG). The effects of lighting from Project activities are not likely to affect marine wildlife that occur in the area.

Vessel Traffic. The OSV *Adele Elise* is the primary vessel planned for use for this Project. The length is 225-feet with a maximum speed of 10.2 knots. A support vessel, the M/V *Jackie C.* will be utilized twice daily for supplies and transport of the crew. The *Jackie C.* currently makes routine runs twice daily to the Platforms in support of current operations. The *Jackie C.* is a 120-foot vessel with a maximum speed of 19 knots. Project activities are currently estimated at 120 days in 2021 for Platform Grace and 240 days in 2023 for Platform Gail. During this time, approximately 48 vessel trips total (16 trips or an average of 1 trip/week for Platform Grace and 32 trips or an average of 1 trip/week for Platform Gail) utilizing the *Adele Elise* will be made from the Platforms to the POLB or Port Hueneme, and the twice daily crew boat trips from Carpinteria (Casitas) Pier to the Platforms using the *Jackie C.* will continue throughout Project.

During these trips, Project vessels will utilize (or continue to utilize) the existing U.S. Coast Guard Traffic Separation Scheme (VTSS) and Joint Oil Fisheries Liaison Office (JOFLO) corridors within the Santa Barbara Channel. During Project-related transit, captains will remain at least 100 m away from all sighted whale species, and 50 m away from dolphins and sea turtles. Transit vessel speed will be reduced when feasible to minimize the potential for vessel strikes with marine wildlife. Due to the small size of the proposed Project vessels, in combination with the use of established vessel traffic lanes, vessel strikes with marine wildlife are not expected to occur.

Oil Spill Potential. Prior to the Project, as part of the well plug and abandonment program, each well will be plugged in accordance with BSEE regulations; therefore, there is no potential for hydrocarbon release from the Project Platforms' wells.

The unintentional release of petroleum into the marine environment from proposed Project activities is limited to Project 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 (i.e., diesel, gasoline.) are more toxic than heavier crude or Bunker-type products, and the loss of a substantial amount of fuel or lubricating oil during survey operations could affect the water column, seafloor, intertidal habitats, and associated biota, resulting in their mortality or substantial injury, and in alteration of the existing habitat quality.

Although many marine organisms have created adaptive strategies to survive in their environment, when these marine organisms are introduced to oil, it adversely affects them physiologically. For example, physiological effects from oil spills on marine life could include the contamination of protective layers of fur or feathers, loss of buoyancy, and loss of locomotive capabilities. Direct lethal toxicity or sub-lethal irritation and temporary alteration of the chemical make-up of the ecosystem could also occur.

Project activities are not expected to have long-term, significant effects on open water habitat. Platform-specific oil spill contingency and response plans have been developed and will be used to direct the containment and recovery of any Project-related vessel 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 Project vessels will adhere to a zero-discharge policy. Due to the small size of the proposed Project 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 following measures have been incorporated into the Project design and will be implemented during Project during construction to minimize potential impacts to marine biological resources:

Measures to Reduce Potential Impacts:

- Conductor cutting and removal activities will be conducted in accordance with Bureau of Safety and Environmental Enforcement (BSEE) Requirements (30 CFR Part 250.1710-1723) for decommissioning activities associated with the existing operational plans at Platforms Grace and Gail.
- As part of the well plug and abandonment program, the wellheads will have been removed and each well plugged in accordance with BSEE regulations prior to conductor cutting/removal activities.
- Conductor cutting and removal activities have been scheduled in one phase at each Platform to minimize Project timing and associated impacts.
- No anchoring has been proposed to minimize potential seafloor disturbance.
- Chevron has designed the Project to utilize internal conductor cutting methodologies to minimize potential noise impacts and potential discharges.
- Initial conductor cuts will be performed approximately 15 feet below mudline to minimize turbidity.

- Existing marine growth on the conductors will be cleared prior to conductor removal activities.
- Chevron will implement its existing agency-approved Oil Spill Contingency and Response Plans and Hazardous Materials Management Plans for both Platform Grace and Gail. These plans will be used to direct the containment and recovery of Project-related petroleum products in the event that they are accidentally released into the marine waters. Each Project vessel will have supporting spill kit equipment and will implement procedures specified in the spill plan to reduce the effects of accidentally discharged petroleum by facilitating rapid response and cleanup operations. The Project vessels will adhere to a zero-discharge policy.

3.2.3 Commercial Fishing

The California Department of Fish and Wildlife (CDFW) maintains the fish block data that is generated by commercial catch records that are provided to the agency by fish buyers. The location of the catch is reported by fish block a grid system that has been established by CDFW. Platform Grace is located within Fish Block 665 and Platform Gail is located within Fish Block 684 (Figure 3.2-3).

As shown in Table 3.2-8, most fish caught within Fish Block 665 (Platform Grace) between 2015-2019 includes ridgeback prawn, market squid, white seabass, halibut, and crab. In Fish Block 684 (Platform Gail), most fish caught between 2015-2019 include market squid, mackerel, lobster, sea urchin and crab. Table 3.2-9 shows that Fish Block 665 has had between 28-47 commercial fishing vessels reporting catch from 2015-2019 and Fish Block 684 has had between 22-33 commercial fishing vessels reporting catch from 2015-2019.

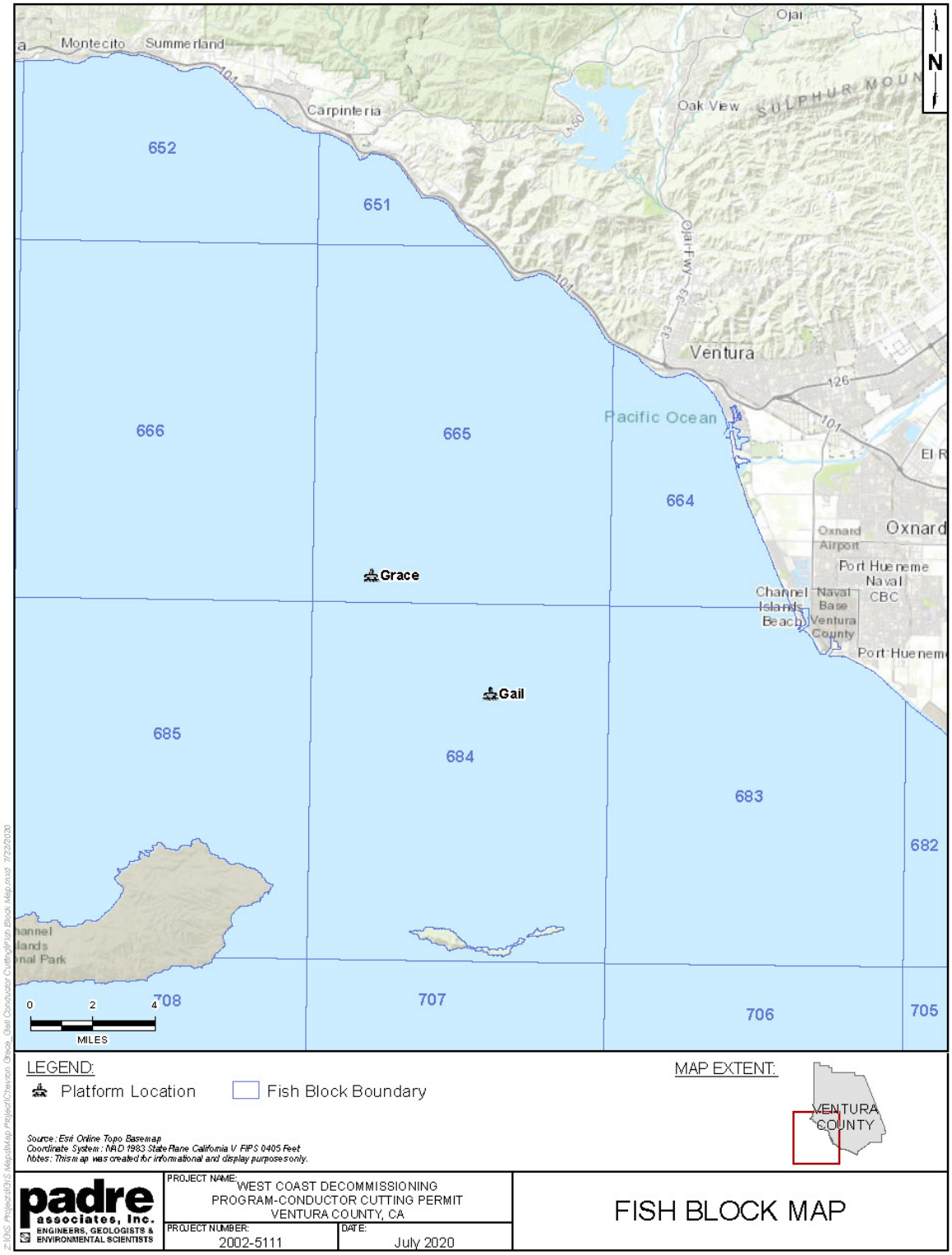


Figure 3.2-3. CDFW Fish Blocks at Platforms Grace and Gail

Table 3.2-8. Summary of Fish Block Catch Data (2015-2019) – Top 5 Species by Volume

Year	Fish Block	Species	Pounds	Value
2015	665	Prawn ridgeback	192,075	$474,125
		Squid market	82,693	$19,153
		Seabass white	65,067	$269,161
		Halibut California	35,815	$166,714
		Crab yellow rock	33,407	$3,183
	684	Squid market	83,192	$20,798
		Mackerel jack	55,529	$4,442
		Mackerel Pacific	41,893	$3,354
		Lobster California spiny	28,707	$607,426
		Crab yellow rock	8,436	$14,689
2016	665	Prawn ridgeback	49,865	$117,426
		Squid market	46,399	$23,887
		Seabass white	35,635	$145,013
		Halibut California	34,894	$168,228
		Crab yellow rock	32,310	$6,253
	684	Squid market	1,918,690	$959,337
		Lobster California spiny	24,209	$474,398
		Sea urchin red	6,615	$13,917
		Crab yellow rock	3,282	$5,744
		Sheephead California	1,695	$8,212
2017	665	Squid market	209,165	$104,533
		Prawn ridgeback	94,104	$219,591
		Crab yellow rock	44,399	$40,293
		Seabass white	44,032	$196,119
		Halibut California	39,211	$212,329
	684	Squid market	648,079	$324,040
		Lobster California spiny	24,408	$470,552
		Sea urchin red	10,333	$16,343
		Mackerel Pacific	5,220	$261
		Halibut California	1,878	$11,268
2018	665	Squid market	120,461	$60,319
		Crab yellow rock	63,516	$62,149
		Seabass white	54,638	$244,472
		Prawn ridgeback	41,040	$115,989
		Halibut California	33,681	$150,187
	684	Squid market	445,812	$222,133
		Ray bat	54,630	$27,315
		Lobster California spiny	24,685	$431,488
		Sea urchin red	2,982	$2,961
		Mackerel Pacific	1,958	$98
2019	665	Crab yellow rock	74,885	$96,677
		Halibut California	57,450	$290,019
		Squid market	30,367	$15,476
		Seabass white	29,541	$145,564
		Lobster California spiny	24,141	$327,651

Year	Fish Block	Species	Pounds	Value
	684	Squid market	232,377	$116,189
		Lobster California spiny	33,443	$454,820
		Sea urchin red	11,277	$10,842
		Halibut California	6,613	$42,520
		Sea cucumber warty	5,428	$12,428

Table 3.2-9. Number of Commercial Fishing Vessels Reporting Catch (2015-2019) within Fish Blocks

Year	Fish Block 665	Fish Block 684
2015	47	24
2016	28	33
2017	44	22
2018	32	24
2019	30	26

Commercial and recreational fishing operations are expected to be limited within the Project site as proposed activities will occur within an area that currently supports existing pipelines and platforms. Existing platform safety zones extend for 500 meters (1,640 feet) from the outer edges of Platforms Grace and Gail. Project activities would be centralized at each Platform during conductor cutting, removal, and loading and are not anticipated to preclude any additional area outside of the existing safety zones that would have the potential to impact commercial fishing operations.

Although no effect to commercial fishing is anticipated, the following procedures will be instituted to further reduce the possibility of negative effects on the commercial fishing industry and recreational fishing opportunity.

Measures to Reduce Potential Impacts:

- Conductor cutting and removal activities have been scheduled in one phase at each Platform to minimize Project timing and associated impacts.
- No anchoring has been proposed to minimize potential seafloor disturbance.
- Project vessels shall use established oil and gas and/or Joint Oil Fisheries Liaison Office corridors to the maximum extent feasible.
- At all times, Project vessels will operate using the highest level of navigational safety and in accordance with International and USCG regulations and guidelines.

3.2.4 Cultural Resources

Underwater archaeological resources are defined as submerged sites having some cultural affiliation. These can take the form of submerged prehistoric sites, isolated prehistoric artifacts; or can be submerged historic shipwrecks, or pieces of ship components, such as cannons or guns.

A high-resolution seafloor survey of the Project area was conducted by BOEM in 2004 and 2005. As indicated in the survey results, approximately 98% of the mapped seafloor was noted to be covered in unconsolidated sandy mud. Additionally, Fugro conducted a geophysical survey for Platform Grace in 2006. This survey confirmed that the seafloor in the Project area is smooth and featureless except for the presence of sand ripples and a bedrock outcrop along the shelf break. The results of a marine archaeological survey within the Platform Grace Project area (Crystal Energy, 2006) indicate that there are no documented significant prehistoric or historic sites located within the proximity of the Platform. None of the small features identified within a 5-mile radius of the Platform were determined within the marine archaeological study as possessing sufficient horizontal extent or complexity to represent potentially significant cultural resources.

Although the 2006 Fugro survey did not include Platform Gail, this area was evaluated for cultural and archaeological resources prior to installation. As noted within the original Platform installation assessment (Westec, 1986), based on a review of a previous geotechnical survey conducted in 1981, there are no identifiable prehistoric cultural resources present in the area of the Platform or pipeline corridors. Smaller targets were identified as linear features such as cables, anchor drag marks, and existing pipeline and other low relief potential outcrop areas.

The OSV *Adele Elise* will be self-positioned during loading and prior to transport to the POLB or Port Hueneme. If necessary, the OSV *Adele Elise* and M/V *Jackie C* will moor at the mooring cans located at both Platforms while waiting for loading to commence. The only seafloor disturbance that would occur as part of the Project would be subsurface during the initial cuts at each conductor and localized turbidity that would occur while the conductor is being jacked to the surface. Since these disturbances are subsurface and highly localized, in addition to recent subsurface data indicating that cultural resources have not been identified within the Platform jacket areas; it is not anticipated that impacts to cultural resources would result from the proposed conductor cutting activities.

The following measures have been incorporated into the Project design and will be implemented during Project during construction to minimize potential impacts to cultural resources:

Measures to Reduce Potential Impacts

- Conductor cutting and removal activities have been scheduled in one phase at each Platform to minimize Project timing and associated impacts.
- No anchoring has been proposed to minimize potential seafloor disturbance.

3.2.5 Geology

Platforms Grace and Gail are located on the Ventura Shelf and lie within the offshore extension of California's Transverse Ranges 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 offshore Project area is situated on the Ventura Mainland Shelf, which with the Mugu Shelf to the south and separated by Hueneme Canyon, forms the offshore extension of the Oxnard Plain. The Ventura Mainland Shelf is underlain by a thick accumulation of fluvial and deltaic deposits.

Several geophysical surveys have been conducted within the past 20 years within the vicinity of the Platforms. The following information has been summarized based upon information provided within the following surveys:

- MMS, 2001. Multibeam Hydrographic Survey Around and Under Oil Platforms in the Santa Barbara Channel and Santa Maria Basin, California.
- MMS, 2003. FINAL REPORT - An Assessment and Physical Characterization of Shell Mounds Associated with Outer Continental Shelf Platforms Located in the Santa Barbara Channel and Santa Maria Basin, California.
- MMS, 2005. MMS FEASIBILITY STUDY FINAL REPORT – Sampling of Outer Continental Shelf Shell Mounds Associated with Platforms Located in the Santa Barbara Channel and Santa Maria Basin.
- Crystal Energy, 2006. Marine Biological Survey of SSP Area (Platform Grace) – Clearwater Port Project.

The results of these multibeam surveys indicate that the largest and most detectable seafloor shell talus areas are found under platforms that are located in shallow, flat bottom areas (<350' depth and <1% slope). Concentrations will be found under any platform with fouling organisms, but in deeper waters, currents tend to be stronger and the "fall time" of shells and muds is longer so that these materials are dispersed over a broader area. Platform age also may reflect the chemical characteristics of these areas because the types and quantities of drilling mud additives permitted for discharge by the regulatory agencies have changed over time.

Platform Grace. The seafloor at and around Platform Grace is sedimentary, comprised of medium to fine grain sand and silts. Areas of "coarse grain sediments" and "scattered rock" habitats are documented in historical and recent reports in two areas, one approximately 200 ft (61 m) south and the other 1,250 ft (381 m) southwest of the Platform, respectively. The seafloor around the platform gradually slopes down towards the south (estimated 0.38% bottom slope).

Historic removal and deposition of fouling organisms on the seafloor has created mid- to low-relief habitat comprised primarily of fragments of mussel shells (*Mytilus* sp.). This habitat area under the Platform's measures approximately 78,000 square feet (ft^2) (7,246 square meters [m^2]) on the northwest side of the Platform footprint and is approximately 13 ft (4 m) tall. The area has a volume of approximately 5,500 cubic yards.

Platform Gail. According to the 2001 MMS survey, the seafloor around Platform Gail has a 1.5% downward slope towards the south-southwest, but the platform appears to influence the bathymetry because several upslope contours (-738' to –741' MLLW) dip under the platform.

The seafloor around Platform Gail is also primarily sedimentary; however, the shell fragments that have accumulated beneath the Platform are lower relief and smaller area than around Platform Grace. MEC Analytical (2003) estimated that there are four identifiable areas of low relief habitat under Platform Gail which are approximately two to three feet tall, the largest of which measures 40 by 60 ft (12 to 18 m) at its base. The total volume of this area under Platform Gail was estimated to be less than 500 cubic yards.

The proposed conductor removal activities do not include any components that would have an effect on local or regional geology. Potential Project impacts are limited to very minor seafloor disturbance to sediments, which are anticipated to settle in a short period of time following completion of each conductor removal.

The following measure have been incorporated into the Project design and will be implemented during Project during construction to minimize potential impacts:

Measure to Reduce Potential Impacts

- No anchoring has been proposed to minimize seafloor disturbance.

3.2.6 Hazardous Materials and Risk of Upset

Regionally, offshore sediment quality was surveyed within the 2013 Southern California Bight Monitoring Program which found that about 94% of the assessed seafloor area was un-impacted, with 6% possibly impacted, and only 0.2% likely impacted (BOEM, 2019).

At the Project sites, the conductor cutting activities will not begin until after all wells on a Platform have been temporarily abandoned, per BSEE regulations, including an assessment of the wellhead and well bore to ensure there is no pressure in the well and all process tanks and vessels are flushed and purged. Therefore, no hazardous materials will remain in the well casing that would have the potential to interact with Project personnel or the environment. Other Platform-based equipment will be utilized to perform the conductor cutting that requires small quantities of petroleum hydrocarbons including fuels, hydraulic fluids, and oils. Short-term use of this equipment during the conductor cutting Project has the potential for incidental spills, however measures outlined below and within each Platform's existing Hazardous Materials Management Plan (including, but not limited to use of secondary containment, best management practices for storage and fueling, and onsite spill response materials) would reduce the potential for spills to the marine environment.

Operation of the OSV *Adele Elise* supporting the conductor removal activity would also involve the use of petroleum hydrocarbons, including small volumes of lubricating oils, hydraulic fluids, and waste oils. The incidental spillage of these materials could result in their release to the marine environment. However, the work vessel maintains its own Oil Spill Response Plan and will have spill containment and cleanup equipment on board in the event of a spill. If an oil spill to the ocean occurs from the vessel, Chevron will respond and assist the vessel in accordance with its agency-approved Oil Spill Response Plan for the SCU. Response procedures for an incident include mobilization of an onsite response team at the Platforms, and, if necessary, deployment of vessels from an offshore spill response organization (OSRO). Effects to the marine environment are not anticipated.

The following measures have been incorporated into the Project design and will be implemented during Project during construction to minimize potential impacts from the use and storage of hazardous materials:

Measures to Reduce Potential Impacts:

- Conductor cutting and removal activities will be conducted in accordance with Bureau of Safety and Environmental Enforcement (BSEE) Requirements (30 CFR Part 250.1710-1723) for decommissioning activities associated with the existing operational plans at Platforms Grace and Gail.
- As part of the well plug and abandonment program, the wellheads will have been removed and each well plugged in accordance with BSEE regulations prior to conductor cutting/removal activities.
- Conductor cutting and removal activities have been scheduled in one phase at each Platform to minimize Project timing and associated impacts.
- No anchoring has been proposed to minimize potential seafloor disturbance.
- Chevron has designed the Project to utilize internal conductor cutting methodologies to minimize potential noise impacts and potential discharges.
- Initial conductor cuts will be performed approximately 15 feet below mudline to minimize turbidity.
- Chevron will implement its existing agency-approved Oil Spill Contingency and Response Plans and Hazardous Materials Management Plans for both Platform Grace and Gail. These plans will be used to direct the containment and recovery of Project-related petroleum products in the event that they are accidentally released into the marine waters. Each Project vessel will have supporting spill kit equipment and will implement procedures specified in the spill plan to reduce the effects of accidentally discharged petroleum by facilitating rapid response and cleanup operations. The Project vessels will adhere to a zero-discharge policy.
- To reduce incidental fueling spills, Chevron shall refuel all vessels involved in the Project at existing onshore fueling facilities (e.g., ports/piers). There shall be no boat-to-boat fuel transfers.

3.2.7 Transportation

The existing offshore facilities consist of two platforms (Platforms Grace and Gail) located in Federal waters, between approximately 10-10.5 miles offshore. A Traffic Separation Scheme (TSS) manages vessel traffic in the Project region. The TSS is a voluntary route of separate opposing flows of vessel traffic with an additional empty safety lane. For smaller oil and gas industry vessels using the Santa Barbara Channel, the Joint Oil Fisheries Liaison Office (JOFLO) has also established transportation corridors directly from offshore platforms to the onshore ports, harbors and piers from which crew and supplies are conveyed.

The Santa Barbara Channel region is heavily transited by large commercial vessels traveling into and out of the POLA/POLB, which are two of the nation's busiest ports. Thousands of cargo ships transit through the region each year. The 2013 total vessel count within the region

had a high of 4,485 vessels (Channel Islands National Marine Sanctuary Advisory Council, 2016). In 2018/2019, Port Hueneme had approximately 1,815 vessels utilize the Port, primarily fishing and shallow draft vessels (Port Hueneme Harbor Safety Committee, 2019).

Onshore, if the Port Hueneme Recycling Alternative is chosen, trucks would need to transit from Port Hueneme northward on Victoria Avenue to Standard Industries in Saticoy. Victoria Avenue is a principal arterial roadway within the County, and averages approximately 55,000 (and up to 61,000) daily trips (VCRMA, 2007). If the alternative route is chosen, trucks would utilize Pleasant Valley Road to Rice Avenue. Rice Avenue is parallel to Victoria Avenue, and is a major collector and primary roadway within the County with an estimated traffic volume of up to approximately 42,000 trips per day (VCRMA, 2005). A study conducted in 2008 analyzed existing traffic conditions and areas of congestion caused by trucks traveling on local arterial roadways from Port Hueneme to Oxnard found that these two roadways experience some of the highest daily truck volumes and traffic within the area. A peak hour study indicated that the Victoria Avenue and Channel Islands Boulevard intersection does not operate at an acceptable level of service within the peak p.m. (typically within 4-6 p.m.) timeframe, and Rice Avenue at both the Gonzales Road intersection and U.S.-101 Southbound ramp intersection does not operate at an acceptable level of service during the a.m. peak hour (typically within 7-9 a.m.), and both peak hours; respectively (SCAG, 2008).

The Project includes conductor cutting, retrieval, and transport for recycling/disposal. These construction activities would include a minor increase in temporary offshore vessel traffic for approximately 360 days (120 days for Platform Grace in 2021 and 240 days for Platform Gail in 2023). During these timeframes, the existing *Jackie C.* crew boat currently servicing the Platforms will continue its existing schedule to run to the Platforms two times per day.

Approximately 48 additional trips will be required to transport recovered conductor material from the Platforms: 16 trips (averaging approximately 1 trip/week) for conductors from Platform Grace and 32 trips (averaging approximately 1 trip/week) for conductors from Platform Gail. Under the POLB (SA Recycling) Alternative, it is estimated that the OSV *Adele Elise* will take approximately 10 hours (one way) to transit 100 nm from Platform Grace or 90 nm from Platform Gail to SA Recycling (or equivalent) in the POLB. The conductor pipe will be offloaded at SA Recycling within the POLB for separation and recycling. No further transport would be required.

As an alternative to transport to and recycling within the POLB, the OSV *Adele Elise* could alternatively take the cut conductors to Port Hueneme for onshore transit to Standard Industries (or equivalent) in Ventura County, California. It anticipated that it would take approximately 3 hours (one way) to go 31 nm from Platform Grace or 21 nm from Platform Gail to Port Hueneme. Once offloaded in Port Hueneme, the conductors will be trucked to Standard Industries (or equivalent) located in Saticoy, Ventura County, California for recycling. Based on a maximum single truck weight of 44,000 lbs, it is estimated that approximately 375 truck trips total to Standard Industries (125 for Grace conductors and 250 for Gail conductors) would be required. The maximum truck trips would be 8-10 trips from Port Hueneme to Saticoy resulting from a weekly offload, depending on truck availability and loading/unloading speed. More than likely these trips would be spread over 2 days within the week timeframe. The anticipated transportation routes from Port Hueneme to Saticoy would be northward on Victoria Avenue and then eastward onto Vineyard Avenue to access the industrial area of Saticoy (Standard Industries). Alternative

routing could be northwest on Pleasant Valley Road and northward Rice Avenue to avoid populated areas or peak traffic conditions.

As shown in Figures 2.2-7 and 2.2-8, Project vessels would be required to adhere to existing oil and gas industry vessel corridors (including TSS and JOFLO as appropriate) while traveling directly from offshore Project platforms to the onshore ports, harbors, and piers from which crew and supplies are conveyed. The crew boat will continue to utilize the JOFLO corridors established for its twice daily runs.

Onshore, the addition of 8-10 trips over 2 workdays within 16 weeks in 2021 and 32 weeks in 2023 is anticipated to result in a negligible increase in onshore traffic. However, since these roadways are already identified as areas of existing traffic congestion during peak hours; transport of conductor materials would be scheduled to avoid peak traffic periods (7-9 a.m. and 4-6 p.m.) to the extent feasible to avoid contributing to onshore traffic impacts.

Following completion of the Project, transportation conditions would return to pre-Project levels. No additional impacts to offshore or onshore transportation are anticipated as a result of the Project.

The following measures have been incorporated into the Project design and will be implemented during Project during construction to minimize potential impacts to offshore and onshore transportation:

Measures to Reduce Potential Impacts:

- Conductor cutting and removal activities have been scheduled in one phase at each Platform to minimize Project timing and associated impacts.
- Project vessels shall use established oil and gas and/or Joint Oil Fisheries Liaison Office corridors to the maximum extent feasible.
- If the Port Hueneme Recycling Alternative is utilized, transport of cut conductor materials would be scheduled to avoid peak traffic periods (7-9 a.m. and 4-6 p.m.) to the extent feasible to avoid contributing to onshore traffic impacts.

3.2.8 Water Quality

Offshore water quality is determined by several factors, including natural seawater properties such as transparency and turbidity, oxygen, nutrients, and trace metals. Water Quality within the Santa Barbara Channel is generally good due to relatively low population and lack of major industrial pollutant inputs. The 1994 Southern California Bight Pilot Project found water quality to be good overall throughout the Southern California Bight. More than 99% of the SCB met California Ocean Plan waste quality objectives for dissolved oxygen and clarity (BOEM, 2019).

Produced water from the Project is currently discharged in accordance with the National Pollutant Discharge Elimination System (NPDES) General Permit for Offshore Oil and Gas Exploration, Development, and Production Operations for Southern California (Permit No. CAG 280000) that was granted continued permit coverage by the EPA in 2019. Maximum annual allowed produced water discharges under this permit for Platform Grace is 2,190,000 (barrel) bbl, and for Platform Gail is 4,380,000 bbl.

Potential impacts to water quality would be limited to the resuspension of sediment material during conductor cutting, cleaning, and removal operations and potential discharges of hydrocarbons from Project vessels or equipment. Potential discharges from Project vessels and/or equipment is discussed further in Section 3.2.6 (Hazardous Materials and Risk of Upset) and Section 3.2.2 (Marine Biological Resources).

Localized seafloor sediments and compounds within the sediments would be temporarily disturbed during conductor preparation/cutting/retrieval, resulting in temporary increased turbidity within the immediate Project work areas. Prior to removal, the external conductor surface will be cleaned of naturally occurring marine growth. As epibiota is detached from each conductor it will fall to the sea floor. For the duration of the Platforms' production operations, BSEE regulations required operations of offshore platforms to clear marine growth from shallow, submerged portions of the Platforms on a regular basis to reduce structure fatigue. The cleaning process is anticipated to result in some increased turbidity as these materials fall through the water column and again as it reaches the seafloor. The suspended materials will rapidly disperse once the cleaning operation is completed.

During the initial phase of conductor cutting operations, there is the potential for the subsurface (15 feet below the mudline) discharge of cutting fluid (i.e., seawater, abrasive materials, steel cuttings) that may cause a short-term disturbance of the sediment around the conductor. As the conductor is pulled towards the surface, there is also the potential for minor amounts of cutting fluid to drift out of the cut site. These discharges will occur intermittently throughout the duration of the Project (120 days at Platform Grace in 2021 and 240 days at Platform Gail in 2023). Turbidity in the water column will increase as the conductor is pulled to the surface, however; due to the 15-foot-deep cutting depth, this majority of cutting fluid will be buried beneath seafloor and disturbance is expected to be minimal.

Potential impacts could also occur as the conductors are pulled from the seafloor and expose the 15-foot-deep footprint of the cut conductor. As natural sediments move to fill the void, suspended sediments will create turbidity that would reduce water clarity and increase sediment deposition. This disturbance would also be localized and short-term, as water conditions and seafloor topography would be expected to return to natural conditions following Project completion.

The following measures have been incorporated into the Project design and will be implemented during Project during construction to minimize potential impacts to water quality:

Measures to Reduce Potential Impacts:

- Conductor cutting and removal activities will be conducted in accordance with Bureau of Safety and Environmental Enforcement (BSEE) Requirements (30 CFR Part 250.1710-1723) for decommissioning activities associated with the existing operational plans at Platforms Grace and Gail.
- As part of the well plug and abandonment program, the wellheads will have been removed and each well plugged in accordance with BSEE regulations prior to conductor cutting/removal activities.
- Conductor cutting and removal activities have been scheduled in one phase at each Platform to minimize Project timing and associated impacts.

- No anchoring has been proposed to minimize potential seafloor disturbance.
- Chevron has designed the Project to utilize internal conductor cutting methodologies to minimize potential noise impacts and potential discharges.
- Initial conductor cuts will be performed approximately 15 feet below mudline to minimize turbidity.
- Existing marine growth on the conductors will be cleared prior to conductor removal activities.
- Chevron will implement its existing agency-approved Oil Spill Contingency and Response Plans and Hazardous Materials Management Plans for both Platform Grace and Gail. These plans will be used to direct the containment and recovery of Project-related petroleum products in the event that they are accidentally released into the marine waters. Each Project vessel will have supporting spill kit equipment and will implement procedures specified in the spill plan to reduce the effects of accidentally discharged petroleum by facilitating rapid response and cleanup operations. The Project vessels will adhere to a zero-discharge policy.
- To reduce incidental fueling spills, Chevron shall refuel all vessels involved in the Project at existing onshore fueling facilities (e.g., ports/piers). There shall be no boat-to-boat fuel transfers.

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APPENDIX A

Equipment Specifications

Adele Elise
225’ x 48’ x 16’
MAINS - Caterpillar
Model - 3516
Number of mains - 2
Mains BHP - 2000 BHP each
Mains Emissions Technology Certified Tier 2 Technology Family Name: 8CPXM69.0EN2
AUX engine info <u>2 – Generators</u> Cummins QSK19-M 1- 660 BHP 1- 755 BHP (Both EPA Tier 2) <u>1 – Bow Thruster</u> Cummins QSK19-M 660 HP (EPA Tier 2) <u>1 – Emergency Generator</u> John Deere 4045TF275D 113 HP (EPA Tier 2)

Engine Performance Data
Cummins Inc.
Columbus, Indiana 47202-3005
www.cummins.com

Industrial

QSK19

FR 4763

Advertised power: 760 BHP (567 kW) @ 2,000 RPM
Governed power: 692 BHP (516 kW) @ 2,100 RPM
Peak torque: 2,275 lb-ft (3,084 N-m) @ 1,500 RPM

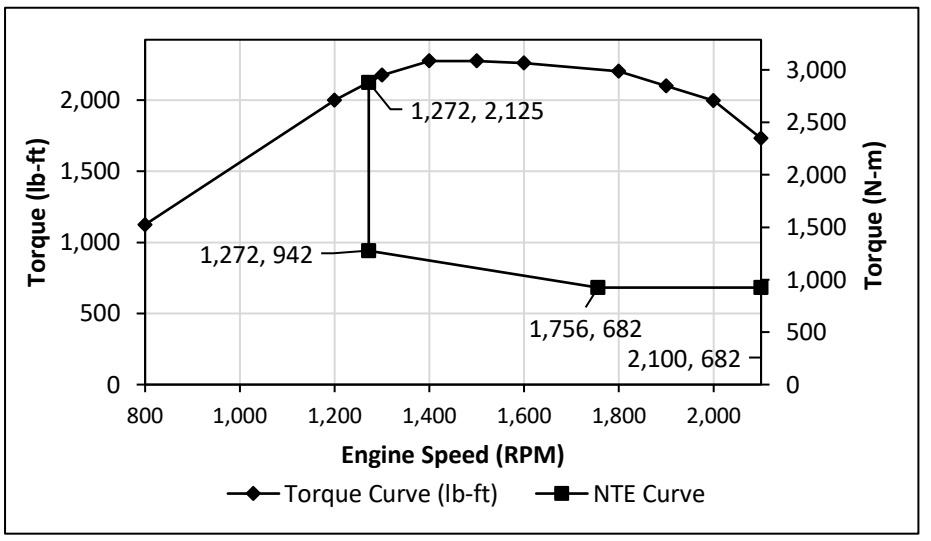
Configuration	CPL code	Revision
D193105CX03	**4220**	**28-Feb-2019**

Compression ratio: **14.7:1**
Bore: **6.25 in (158.7 mm)**
Fuel system: **Cummins MCRS**
Stroke: **6.25 in (158.7 mm)**
Emission certification: **U.S. EPA Tier 4(f), EU Stage V**

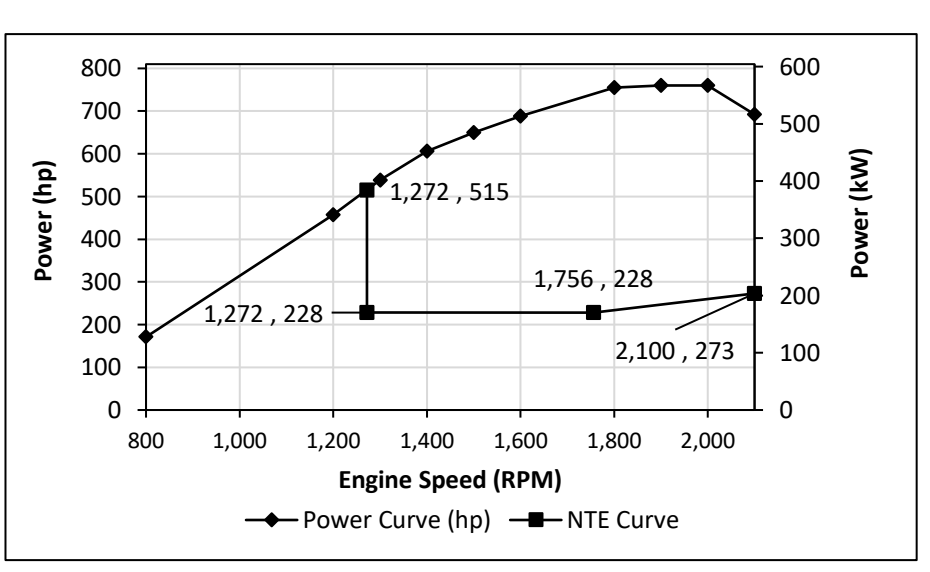
Displacement: **1,159 in³ (19 L)**
Aspiration: **Turbocharged and Charge Air Cooled**
Number of cylinders: **6**

All data is subject to change without notice and based on these operating conditions:
- Inlet air restriction of 20 in-H_2O (5 kPa)
- Exhaust restriction of 3.22 in-Hg (10.9 kPa)
- Relative humidity of 55%

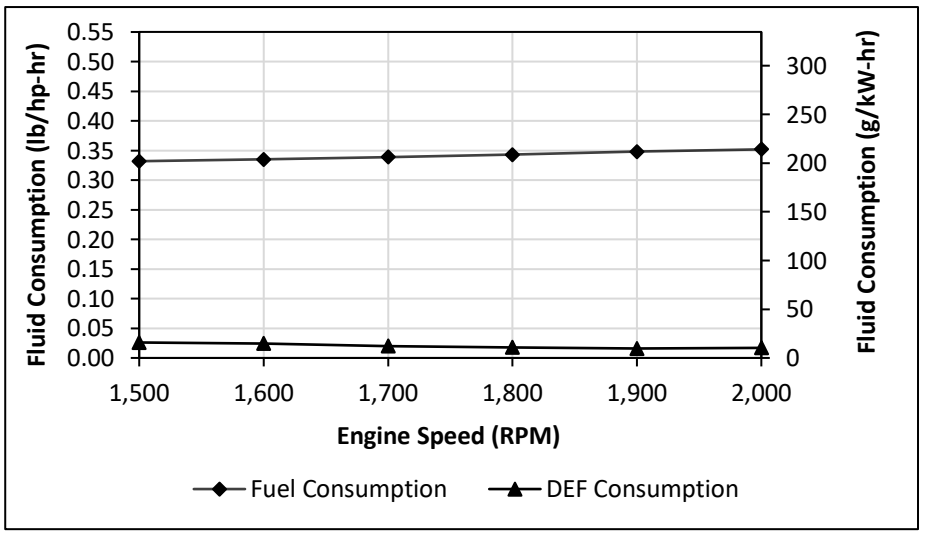
Rating type: Intermittent
- Excludes parasitic loads associated with the alternator, fan and other optional driven components
- Coolant flows and heat rejection data based on a 50/50 mixture of ethylene glycol and water



Torque Output[1]		
RPM	**lb-ft**	**N-m**
800	1,125	1,525
1,200	2,000	2,712
1,300	2,175	2,949
1,400	2,275	3,084
1,500	2,275	3,084
1,600	2,260	3,064
1,800	2,203	2,987
1,900	2,100	2,847
2,000	1,996	2,706
2,100	1,730	2,346



Power Output[1]		
RPM	**hp**	**kW**
800	171	128
1,200	457	341
1,300	538	401
1,400	606	452
1,500	650	485
1,600	688	513
1,800	755	563
1,900	760	567
2,000	760	567
2,100	692	516



Fuel Consumption[1] (DEF Consumption)		
RPM	**lb/hp-hr**	**g/kW-hr**
1,500	0.332 (0.026)	202 (15.9)
1,600	0.335 (0.024)	204 (14.9)
1,700	0.339 (0.020)	206 (12.2)
1,800	0.343 (0.018)	209 (11)
1,900	0.348 (0.016)	212 (9.7)
2,000	0.352 (0.017)	214 (10.4)

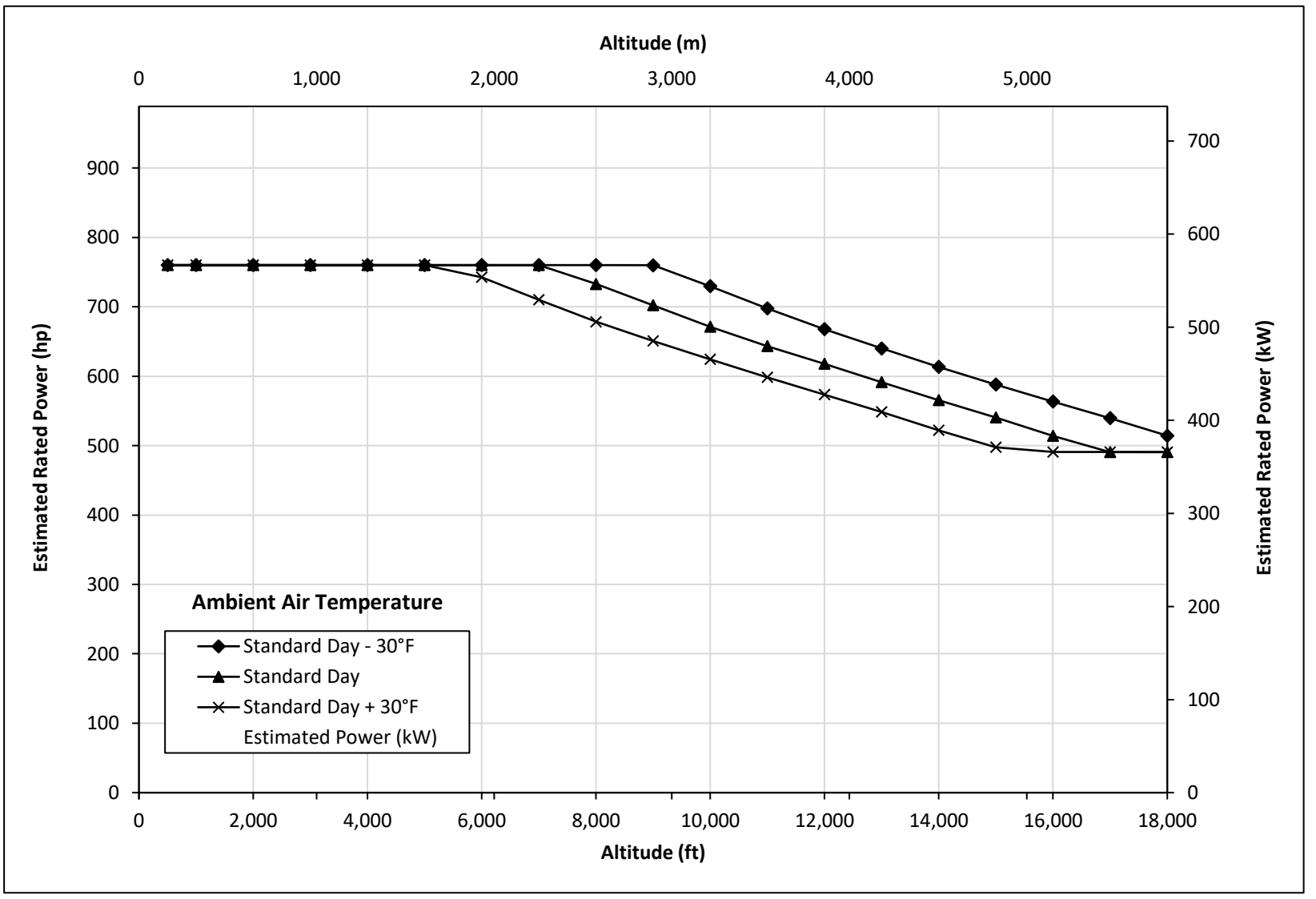
STATUS FOR CURVES AND DATA: Production

CHIEF ENGINEER: Jason Mao

Altitude Derate

Altitude before electronic derate at standard day and 3.2 in-Hg (10.9 kPa) exhaust restriction: 7,000 ft 2,134 m

Estimated Rated Power Output vs. Altitude[2]



	Standard Day - 30°F		Standard Day		Standard Day + 30°F	
Altitude (ft)	**Temperature (°F)**	**Est. Power (hp)**	**Temperature (°F)**	**Est. Power (hp)**	**Temperature (°F)**	**Est. Power (hp)**
500	55	760	85	760	115	760
1,000	53	760	83	760	113	760
2,000	50	760	80	760	110	760
3,000	46	760	76	760	106	760
4,000	43	760	73	760	103	760
5,000	39	760	69	760	99	760
6,000	35	760	65	760	95	742
7,000	32	760	62	760	92	710
8,000	28	760	58	733	88	678
9,000	25	760	55	702	85	651
10,000	21	729	51	671	81	624
11,000	18	698	48	643	78	598
12,000	14	667	44	618	74	573
13,000	10	640	40	591	70	548
14,000	7	613	37	565	67	522
15,000	3	588	33	541	63	498
16,000	0	563	30	514	60	491
17,000	-4	539	26	491	56	491
18,000	-7	514	23	490	53	491

Performance Data

Minimum speed for full load sustained operation	1,500	RPM
Minimum low idle speed	600	RPM
Maximum low idle speed	1,200	RPM

	Advertised power		Governed power*	
Engine speed	2,000 RPM		2,100 RPM	
Power output	760 hp	567 kW	692 hp	516 kW
Torque output	1,996 lb-ft	2,706 N-m	1,731 lb-ft	2,347 N-m
Motoring torque	273 lb-ft	370 N-m	288 lb-ft	390 N-m
Intake manifold pressure	67 in-Hg	226 kPa	65 in-Hg	220 kPa
Turbo comp. outlet pressure	71 in-Hg	240 kPa	69 in-Hg	235 kPa
Turbo comp. outlet temperature	372 °F	189.0 °C	367 °F	186.4 °C
Inlet air flow	1,787 ft³/min	844 L/s	1,828 ft³/min	863 L/s
Charge air flow	130 lb/min	59 kg/min	132 lb/min	60 kg/min
Exhaust gas flow	4,261 ft³/min	2,011 L/s	4,129 ft³/min	1,948 L/s
Exhaust gas temperature	880 °F	471.0 °C	811 °F	433.0 °C
Heat rejection to ambient air	2,443 BTU/min	43 kW	2,287 BTU/min	40 kW
Heat rejection to exhaust gas	27,974 BTU/min	492 kW	26,653 BTU/min	469 kW
Heat rejection to HTC coolant	10,720 BTU/min	189 kW	10,140 BTU/min	178 kW

**If section is blank, the governed power data is the same as the advertised power data*

Engine Sound Pressure Levels[3] (Noise)

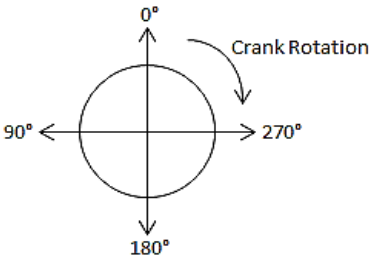
Top side	101.1	dBa
Right side	100.6	dBa
Left side	96.9	dBa
Front side	103.3	dBa
Exhaust noise with aftertreatment	115.0	dBa
Exhaust noise out of the turbocharger	NA	dBa

General Engine Data

Approximate engine weight (wet)[4]	4,771	lbm	2,164	kg
Approximate engine weight (dry)[4]	4,550	lbm	2,064	kg
Maximum overspeed capability	2,300	RPM		
Mass moment of inertia of rotating components (excluding flywheel)	16.11	in-lbf-sec²	2	kg-m²
Maximum installed engine power angle	6	°		
Maximum installed engine tilt angle	6	°		

Engine Mounting

Moment of inertia:				
•x-axis (roll)	1,802	in-lbf-sec²	204	kg-m²
•y-axis (pitch)	4,665	in-lbf-sec²	527	kg-m²
•z-axis (yaw)	3,654	in-lbf-sec²	413	kg-m²
Center of gravity:				
•from rear face of block	23	in	583	mm
•from engine centerline to left side of engine (as viewed from rear of engine)	-1	in	-14	mm
•above crankshaft centerline	10	in	250	mm
Maximum crankshaft thrust bearing load limit:				
•intermittent load	1,500	lbf	6,672	N
•continuous load	750	lbf	3,336	N
Maximum static bending moment at rear face of block	2,095	lb-ft	2,841	N-m
Maximum bending moment available from front of crankshaft:				
•0 degrees	1,193	lb-ft	1,617	N-m
•90 degrees	1,468	lb-ft	1,990	N-m
•180 degrees	1,825	lb-ft	2,475	N-m
•270 degrees	1,832	lb-ft	2,484	N-m



Note: maximum torque available from front of crankshaft requires a torsional vibration analysis (TVA). (Reference AEB 24.28)

Intake Air System				
Maximum air temperature rise over ambient at turbocharger compressor inlet	20	delta °F	11.1	delta °C
Maximum intake air restriction with:				
•clean filter	20	in-H2O	5.0	kPa
•dirty filter	30	in-H2O	7.5	kPa
Minimum air cleaner dirt holding capacity	25	g/cfm		
Maximum intake air bleed for accessories at intake manifold (not including air compressor)	0	ft³/min	0	L/s
Recommended intake piping size (inner diameter)	5.8	in	147	mm
Exhaust System				
Maximum exhaust restriction	4.0	in-Hg	13.4	kPa
Note: restriction of Cummins supplied aftertreatment components vary by configuration; refer to aftertreatment datasheet for further detail				
Recommended exhaust piping size (inner diameter)	7.8	in	197.6	mm
Maximum downpipe temperature drop	TBD	°F	TBD	°C
Maximum static bending moment at exhaust outlet flange	15	lb-ft	21	N-m
Note: exhaust manifold or turbocharger blanketing is NOT acceptable				
Lubrication System				
Nominal operating oil pressure at:				
•minimum low idle speed	20	psi	138	kPa
•advertised speed	70	psi	483	kPa
Minimum oil pressure within 4 seconds of engine first firing at minimum low idle speed (measured at turbocharger oil inlet)	17	psi	117	kPa
Maximum oil flow to all accessories	5	gpm	19	L/min
Maximum oil pressure spike on cold engine	150	psi	1,034	kPa
Fuel System (reference CEB 598 & AEB 24.10)				
Fuel compatibility (consult Service Bulletin #3379001 for appropriate use of other fuels)	ULSD			
Maximum heat rejection to return fuel which occurs at the following conditions:	284	BTU/min	5	kW
•fuel return flow	600	lb/hr	272.0	kg/hr
•fuel return temperature (prior to fuel cooler)	219	°F	104.0	°C
Maximum fuel return flow	600	lb/hr	272	kg/hr
Maximum fuel supply temperature (measured at on-engine fuel inlet fitting)	160	°F	71.0	°C
Maximum fuel supply pressure (measured at on-engine fuel inlet fitting)	5	psi	34	kPa
Maximum fuel return restriction (measured at on-engine fuel drain fitting)	10.0	in-Hg	34	kPa
Stage 1 filter(s)				
Maximum fuel supply flow across Stage 1 filter(s)	866	lb/hr	392.8	kg/hr
Maximum combined fuel supply restriction of Stage 1 assembly & OEM plumbing (measured at on-engine fuel inlet fitting) with:				
•clean Stage 1 fuel filter(s) at maximum fuel supply flow	5.0	in-Hg	17	kPa
•dirty Stage 1 fuel filter(s) at maximum fuel supply flow	10.0	in-Hg	34	kPa
Nominal restriction of clean Stage 1 fuel filter assembly at maximum fuel supply flow	2.1	in-Hg	7	kPa
Maximum fuel inlet pressure measured at Stage 1 inlet	5	psi	34	kPa
Recommended maximum fuel inlet pressure for Seeing Is Believing® (measured at Stage 1 inlet)	2	psi	14	kPa
For applications with Stage 2 filters mounted off-engine (measured at maximum fuel supply flow condition)				
Maximum fuel supply flow across Stage 2 filter(s)	1,489	lb/hr	675.4	kg/hr
Maximum fuel supply restriction from low pressure fuel pump outlet to Stage 2 filter head inlet	10.3	in-Hg	35	kPa
Maximum fuel supply restriction from Stage 2 filter head outlet to high pressure fuel pump inlet	10.3	in-Hg	35	kPa
Note: assume 2 in-Hg (7 kPa) for every 33 in (838 mm) above/below fuel pump				

Cooling Systems (reference AEB 24.18)

Cooling system type	1 Pump 1 Loop			
Minimum fill rate	5	gpm	19	L/min
Maximum deaeration time	25	min		
Acceptable types of deaeration systems	Positive			
Minimum water pump inlet pressure with fully deaerating cooling system	0.0	in-Hg	0	kPa
Maximum static head of coolant above crankshaft centerline	60	ft	18.2	m
Minimum pressure cap rating at sea level	7	psi	48.0	kPa
Maximum pressure cap rating at sea level	15	psi	103.0	kPa
Minimum coolant expansion space (% of total cooling system capacity)	5	%		
Minimum drawdown (% of total cooling system capacity)	11	%		

Charge-Air Cooling (CAC) System

Maximum intake manifold temperature at 77 °F (25 °C) ambient air temperature	120	°F	49.0	°C
Maximum pressure drop across charge-air cooler and OEM CAC piping (IMPD)	4.0	in-Hg	13.5	kPa
Maximum intake manifold temperature differential (Ambient to IMT) (IMTD)	43	delta °F	23.9	delta °C

Designing the CAC for LAT

In order to avoid engine derates, the charge-air cooler must not exceed the maximum intake manifold temperature up to the desired Limiting Ambient Temperature (LAT) of the equipment manufacturer. Engine data is provided below for sizing the charge-air cooler at the LAT condition. This data is provided under the assumption that the equipment will be operating with the maximum allowable air temperature rise over ambient at the compressor inlet of 20 °F (11.1 °C).

Criteria for sizing CAC at advertised power and LAT

		105 °F LAT (41 °C LAT)		115 °F LAT (46 °C LAT)		125 °F LAT (52 °C LAT)	
Maximum compressor inlet temperature	°F (°C)	125	(51.7)	135	(57.2)	145	(62.8)
Intake manifold pressure	in-Hg (kPa)	96	(326)	96	(324)	94	(319)
Turbocharger compressor outlet pressure	in-Hg (kPa)	100	(337)	99	(334)	97	(329)
Intake air flow	ft³/min (L/s)	1,968	(929)	1,951	(921)	1,932	(912)
Charge air flow	lb/min (kg/min)	124	(56)	122	(56)	120	(54)
Turbocharger compressor outlet temperature	°F (°C)	456	(235.3)	469	(242.8)	479	(248.3)
Maximum intake manifold temperature	°F (°C)	147	(63.7)	157	(69.2)	162	(72.2)

Criteria for sizing CAC at governed power and LAT*

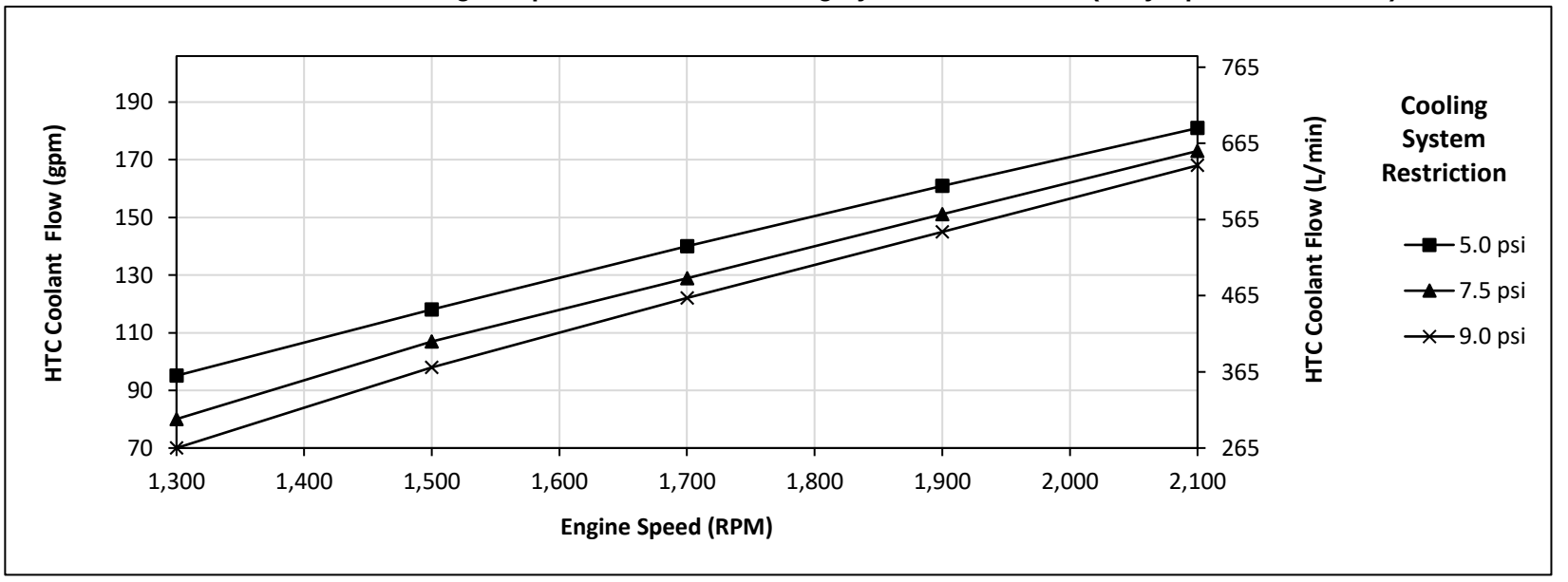
		105 °F LAT (41 °C LAT)		115 °F LAT (46 °C LAT)		125 °F LAT (52 °C LAT)	
Maximum compressor inlet temperature	°F (°C)	125	(51.7)	135	(57.2)	145	(62.8)
Intake manifold pressure	in-Hg (kPa)	92	(312)	91	(307)	88	(299)
Turbocharger compressor outlet pressure	in-Hg (kPa)	96	(324)	94	(317)	91	(309)
Intake air flow	ft³/min (L/s)	1,981	(935)	1,948	(919)	1,913	(903)
Charge air flow	lb/min (kg/min)	125	(57)	121	(55)	117	(53)
Turbocharger compressor outlet temperature	°F (°C)	437	(225)	444	(229)	451	(232.5)
Maximum intake manifold temperature	°F (°C)	147	(63.7)	157	(69.2)	162	(72.2)

**If section is blank, the governed power data is the same as the advertised power data*

High Temperature Circuit (HTC) commonly referred to as jacket water

HTC coolant volume (engine only)	42	quarts	40	L
HTC thermostat opening temperature	180	°F	82.0	°C
HTC thermostat fully open temperature	202	°F	94.4	°C
Maximum HTC thermostat outlet temperature at LAT (maximum top tank temperature)	212	°F	100.0	°C
Minimum operating HTC temperature (for continuous cold weather applications)	160	°F	71.0	°C
Maximum external HTC restriction at 2000 RPM	5	psi	34	kPa
Maximum auxiliary coolant flow at rated speed	28	gpm	108	L/min
Maximum auxiliary coolant flow at minimum low idle	10	gpm	37	L/min

HTC Coolant Flow vs Engine Speed for Various Cooling System Restrictions (Fully Open Thermostats)

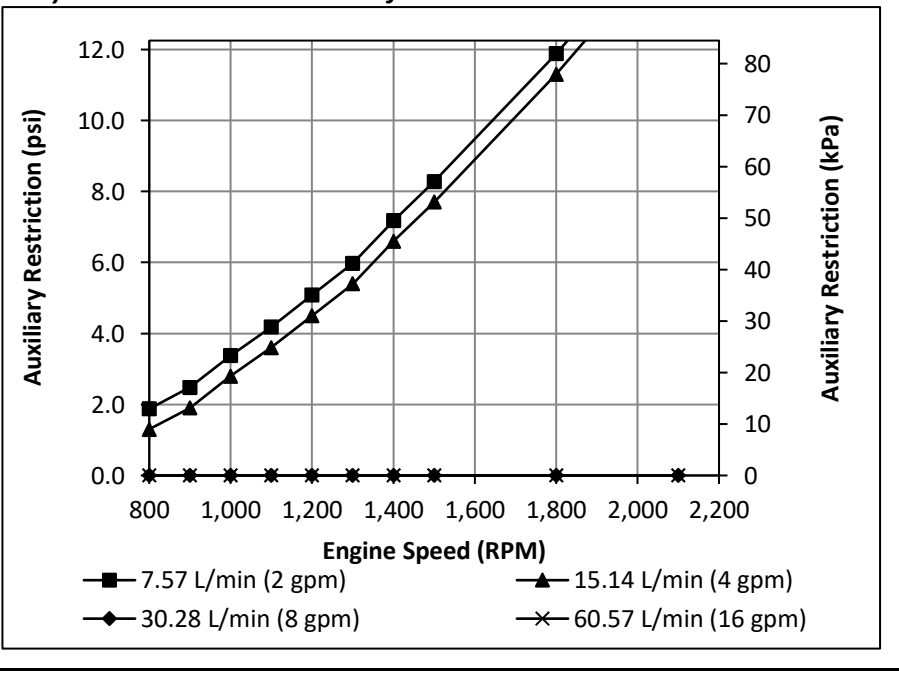


HTC Cooling System Restriction

Engine Speed	5.0 psi (34.5 kPa)		7.5 psi (51.7 kPa)		9.0 psi (62.1 kPa)	
RPM	gpm	L/min	gpm	L/min	gpm	L/min
1,300	95	360	80	303	70	265
1,500	118	447	107	405	98	371
1,700	140	530	129	488	122	462
1,900	161	609	151	572	145	549
2,100	181	685	173	655	168	636

Auxiliary (Including DEF Tank Heater) Coolant Flow vs. Auxiliary Restriction

Engine Speed (RPM)	Auxiliary Coolant Flow			
	7.57 L/min (2 gpm)	15.14 L/min (4 gpm)	30.28 L/min (8 gpm)	60.57 L/min (16 gpm)
	Auxiliary Restriction psi (kPa)			
600	0.6 (4)	0 (0)	0 (0)	0 (0)
700	1.4 (9.5)	0.8 (5.5)	0 (0)	0 (0)
800	1.9 (13)	1.3 (9)	0 (0)	0 (0)
900	2.5 (17.1)	1.9 (13.1)	0 (0)	0 (0)
1,000	3.4 (23.3)	2.8 (19.3)	0 (0)	0 (0)
1,100	4.2 (28.8)	3.6 (24.8)	0 (0)	0 (0)
1,200	5.1 (35)	4.5 (31)	0 (0)	0 (0)
1,300	6 (41.2)	5.4 (37.2)	0 (0)	0 (0)
1,400	7.2 (49.5)	6.6 (45.5)	0 (0)	0 (0)
1,500	8.3 (57.1)	7.7 (53.1)	0 (0)	0 (0)
1,800	11.9 (81.9)	11.3 (77.9)	0 (0)	0 (0)
2,100	15.9 (109.5)	15.3 (105.5)	0 (0)	0 (0)



Electrical System

System voltage	24	V
Minimum battery capacity for engine only [cold soak at 0 °F (-18 °C) or above]:		
•cold cranking amperes (CCA)	900	CCA
•reserve capacity (RC)	320	min

Note: cranking system resistance must be ≤ 0.002 ohms OR must be ≤ 0.004 ohms while meeting the "Alternate Functional Validation Procedure (QSK38 and Larger) - Cranking System" stated in AEB 24.53.

Cranking System (Cold Starting Capability)

Minimum cranking speed	110	RPM		
Maximum parasitic load 10 °F (-12 °C)	330	lb-ft	447	N-m
Unaided Cold Start				
Minimum ambient temperature	10	°F	-12.2	°C
Cranking torque at minimum unaided cold start temperature	1,302	lb-ft	1,765	N-m
Aided Cold Start				
Minimum ambient temperature with only ether	-25	°F	-31.7	°C
Minimum ambient temperature with only coolant and oil heaters	-40	°F	-40.0	°C

Footnotes

1. Tolerance within +/- 5% for Torque Output, Power Output, and Fuel Consumption
2. The estimated rated power output vs. altitude assumes the air temperature rise over ambient at turbocharger compressor inlet equals the maximum limit of 20 °F (11.1 °C) . The power is calculated based on the electronic derate.
3. Free field sound pressure levels measured at 3.28 ft (1 m) and full load governed speed (excludes noise from intake, cooling system, and driven components)
4. Includes DA4712, FH4754, FW4015, LF4074, and OP4097. Does not include an alternator, stage 1 fuel filtration, or aftertreatment.

Performance Curves Conditions

Torque, power, and fuel represents gross engine performance capabilities obtained and corrected in accordance with SAE J1995 conditions of:

- inlet air supply pressure (absolute): 14.5 psi (100 kPa)
- inlet air supply temperature: 77 ˚F (25 ˚C)
- ASTM D975 Grade No. 2-D S15 diesel

The engine performance data will approximate the values obtained when the observed performance data is corrected to ISO 3046-1, ISO 1585, and ISO 9249 standard reference conditions.

Rating Guidelines

1. Load Ratings

1.1 Maximum Rating may be used for intermittent load applications (full throttle operation is cyclically interrupted) where the average load factor does not exceed the continuous rating, and where full throttle operation does not exceed 60 minutes without interruption.

1.2 Continuous rating may be used for constant load applications requiring uninterrupted service at full throttle for extended periods of time and for Water Management applications.

2. Speed Ratings

2.1 If the application qualifies for the continuous load rating the governor cut-in point shall be set within the limits of the solid line portion of the continuous curve.

2.2 If the application qualifies for the maximum load rating the governor cut-in point shall be set within the limits of the solid line portion of the maximum curve.

3. Definitions

3.1 Advertised Power - The horsepower for which the fuel rating was developed. This horsepower is stated on the dataplate.

3.2 Maximum Power - The maximum horsepower produced by the engine for the specified rating.

3.3 Governed Power - The horsepower produced at the engine's highest RPM for the specified rating. Customer specific high speed idle governor breakpoint can not be set lower than this RPM.

3.4 Load (Speed) factor - the arithmetic mean of the load (speed) profile of the normal cycle, not including prolonged periods of idle operation.

3.5 TBD - To be determined

3.6 NA - Not available

3.7 N/A - Not applicable

4. International Rating Guidelines

These ratings represent gross engine performance capabilities obtained and corrected in accordance with SAE J1995 and the conditions as stated on the front of the curve. The ratings are in conformance with the requirements specified in ISO 3046, BS 5514 and DIN 6271. Although these specific standards have a note excluding road construction, earth moving equipment, agricultural tractors and industrial trucks as applications not covered by the standard, these are included as acceptable applications of these ratings.

The Maximum Rating conforms to ISO 3046 overload power and fuel stop power. The Continuous Rating may be used for continuous service in commercial applications and it conforms to ISO 3046 continuous power.

Reference standards: BS 5514 and DIN 6271 standards are based on ISO 3046.

Datasheet Template Version: 3.0

Change Log

Date	***Author***	***Change Description***
2/6/18	C. Jebavy	Initial release of datasheet (Preliminary - Estimated)
10/17/18	C. Jebavy	Initial release of datasheet (Preliminary - Measured)
1/8/19	K. McCarthy	Left side noise changed from 69.9 dB to 96.9 dB
1/8/19	K. McCarthy	Motoring torque values updated in performance data
2/27/19	D. Zaragoza	Added Certifications (EPA Tier 4(f) and EU Stage V)
2/27/19	D. Zaragoza	NTE Line on Torque curve values now correspond to primary axis
2/27/19	D. Zaragoza	Updated Engine Speed vs Auxiliary Restriction curve
2/27/19	D. Zaragoza	Updated Exhaust Gas Temperature
2/28/19	D. Zaragoza	Initial release of datasheet (Production)

C & C Boats, Inc.
805-445-9456
Boatcc@aol.com
08/17/2018

Jackie C. Specifications

Certification: USCG

Official #: D925120

Length: 120'

Beam: 26'

Draft: 7'

Freeboard: 6'

Deck Cargo Area: 60' x 20'

Deck Cargo Capacity: 34-50 Long Tons

Passengers: 73 Adults

Crew: 3-5

Speed Approximately: 17 Knots MAX: 19 KNOTS

Fuel Consumption: 60 GPH

Main Engines: (4)MTU Series 60 Tier II

Horsepower: 2400

Generators: (2) 30 KW Tier III

Other Equipment: GPS
VHF
Cell Phone
Dual Radar

Dry Dock Due: 6/2019

Deck Inspection: 6/2018

EARLY 2017

Engine Information Form

Commercial Harbor Craft Report

C & C Boats, Inc.

Please refer to sections 93118.5(g) and (h), title 13, chapter 5.1 CCR
- Initial Reporting of California Harbor Craft Fleet
- Compliance Plan
- Demonstration of Compliance
- Reporting for Change of Annual Hours of Operation, Vessel Category/ Use, Control of Vessel Operations, or a Change of Ownership of Vessel or Engine

1/1/2016

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ENGINE INFORMATION

(7)	Note	(20)	(21)	(22)	(23A)	(23B)	(24)	(25)	(26)	(27)	(28)	(29)	(30)	(31)
Vsl. No.	Harbor Craft Name	Main or Aux.	Engine Make	Engine Model	Current Engine Model Year	If Rebuilt To Tier 1 Standard, Year of Rebuild	Engine Family	Engine Serial Number	Rated Brake Horse-power	Total Engine Displacement (Liters)	Number of Cylinders	Hour Meter at the Last Top End Rebuild	Hour Meter at Last Full Rebuild	Number of Full Engine Rebuilds
0	**Nautilus**	**Main**	**Caterpillar**	**D399**	**1979**	**2004**	**4CPXH0928EBK**	**ABC123XYZ1234PDQ**	**1,125**	**64.04**	**16**			**1**
1	Jackie C.	Main	MTU	6062-HK34	2008		MTU 4 cycle	06R1012152	600	14.00	6			0
1	Jackie C.	Main	MTU	6062-HK35	2008		MTU 4 cycle	06R1042102	600	14	6			0
1	Jackie C.	Main	MTU	6062-HK35	2008		MTU 4 cycle	06R1012155	600	14	6			0
1	Jackie C.	Main	MTU	6062-HK34	2008		MTU 4 cycle	06R1012147	600	14	6			0
1	Jackie C.	Aux	John Deere	4045D	2008		John Deere 4 cycle	745006	62	5	4			0
1	Jackie C.	Aux	John Deere	4045D	2008		John Deere 4 cycle	751795	62	5	4			0
2	Broadbill	Main	Detroit Diesel	6062-HK35	2006		Detroit Diesel 4 cycle	06R0902607	600	14	6			0
2	Broadbill	Main	Detroit Diesel	6062-HK35	2002		Detroit Diesel 4 cycle	06R06639320	600	14	6			1
2	Broadbill	Main	Detroit Diesel	6062-HK35	2006		Detroit Diesel 4 cycle	06R0902756	600	14	6			0
2	Broadbill	Main	Detroit Diesel	6062-HK35	2006		Detroit Diesel 4 cycle	06R0902759	600	14	6			0

C & C Boats, Inc.

1/1/2016

If you print a hardcopy, please select Print Range
Pages From: 1 To: 25 to print appropriate pages.

DEMONSTRATION OF COMPLIANCE

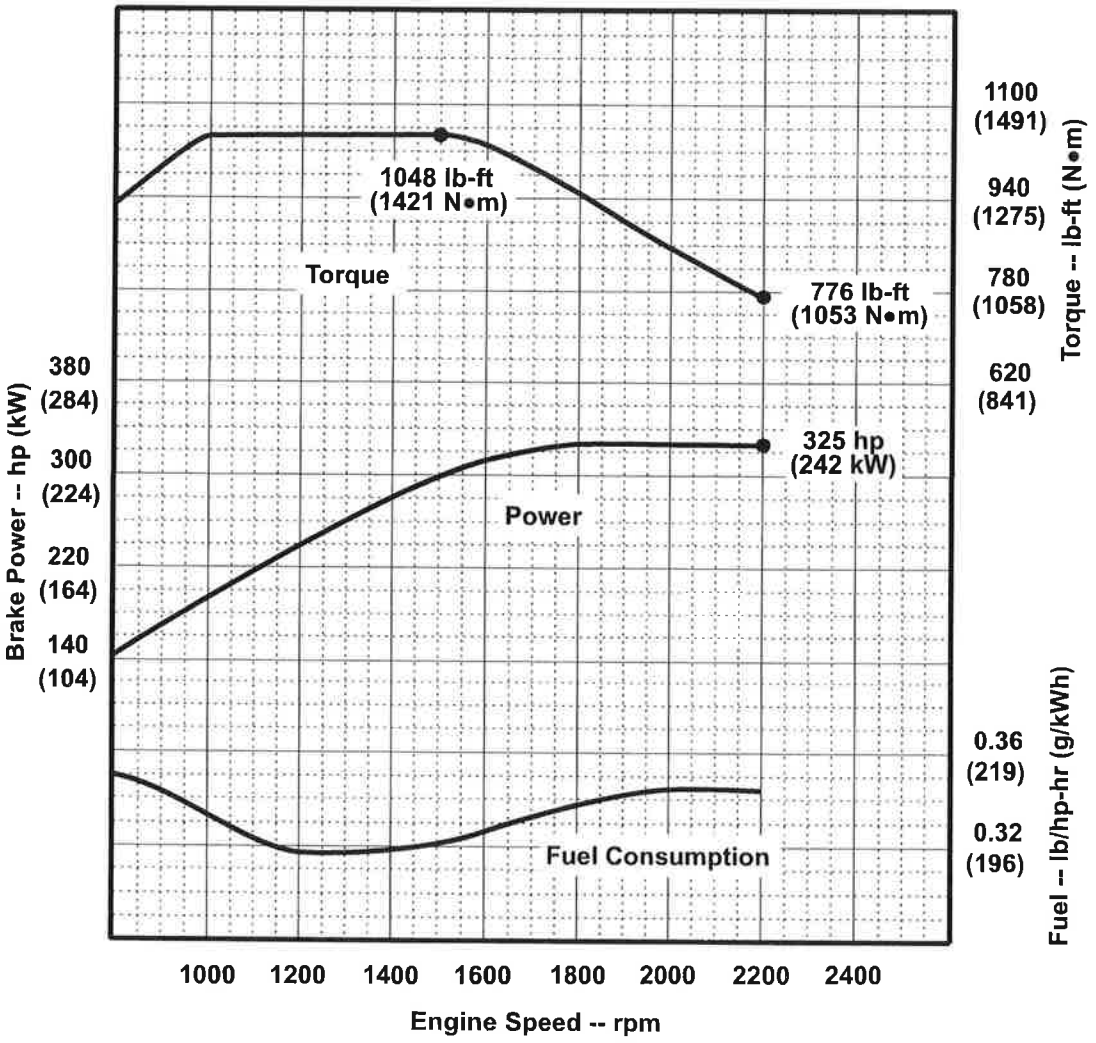
(7)	Note	(20)	(21)	(22)	(23A)	(51)	(52)	(53)	(54)	(55)
Vsl. No.	Harbor Craft Name	Main or Aux.	Engine Make	Engine Model	Current Engine Model Year	Actual Engine Replacement Year	Actual Engine Rebuild Year	Actual Engine Upgrade Year	Actual DECS Installation Year	Describe in Detail the Engine Replacements, Rebuilds, Upgrades, Use of DECS and Any Other Measures Planned to Meet the Requirements of the Regulation
0	**Nautilus**	**Main**	**Caterpillar**	**D399**	**1979**					
1	Jackie C.	Main	MTU	6062-HK34	2008	2009				EPA Certified Tier 2 Engine
1	Jackie C.	Main	MTU	6062-HK35	2008	2009				EPA Certified Tier 2 Engine
1	Jackie C.	Main	MTU	6062-HK35	2008	2009				EPA Certified Tier 2 Engine
1	Jackie C.	Main	MTU	6062-HK34	2008	2009				EPA Certified Tier 2 Engine
1	Jackie C.	Aux	John Deere	4045D	2008	2009				EPA Certified Tier 2 Engine
1	Jackie C.	Aux	John Deere	4045D	2008	2009				EPA Certified Tier 2 Engine
2	Broadbill	Main	Detroit Diesel	6062-HK35	2006	2006				EPA Certified Tier 2 Engine
2	Broadbill	Main	Detroit Diesel	6062-HK35	2002					Upgraded to Tier 2 2015
2	Broadbill	Main	Detroit Diesel	6062-HK35	2006	2006				EPA Certified Tier 2 Engine
2	Broadbill	Main	Detroit Diesel	6062-HK35	2006	2006				EPA Certified Tier 2 Engine

JOHN DEERE

ENGINE PERFORMANCE CURVE

Rating: Gross Power
Application: Industrial - Heavy-Duty
Power Bulge - 0%
Torque Rise - 35%

PowerTech Plus™ 9.0 L Engine
Model: **6090HF485**
JD Electronic Control
325 hp @ 2200 rpm
242 kW @ 2200 rpm
[See Option Code Table]



STANDARD CONDITIONS*

Air Intake Restriction ..... 12 in.H_2O (3 kPa)
Exhaust Back Pressure ..... 30 in.H_2O (7.5 kPa)

Gross power guaranteed within + or - 5% at SAE J1995 and ISO 3046 conditions:
- 77 °F (25 °C) air inlet temperature
- 29.31 in.Hg (99 kPa) barometer
- 104 °F (40 °C) fuel inlet temperature
- 0.853 fuel specific gravity @ 60 °F (15.5 °C)

Conversion factors:
- Power: kW = hp x 0.746
- Fuel: 1 gal = 7.1 lb, 1 L = 0.85 kg
- Torque: N•m = lb-ft x 1.356

All values are from currently available data and are subject to change without notice.

Notes:

Tier-3 Emission Certifications:	Certified by:
CARB; EPA; EU Ref: Engine Emission Label	Brian L. Carlson 15 July 2005

* Revised Data
Curve: 6090HF485325_2200_0_35 ..... Sheet 1 of 2
July 2005

Engine Installation Criteria

General Data

Model	6090HF485
Number of Cylinders	6
Bore and Stroke--in. (mm)	4.661 (118.4) x 5.354 (136.0)
Displacement--in.^{3} (L)	548 (9)
Compression Ratio	16.0 : 1
Valves per Cylinder--Intake/Exhaust	2 / 2
Firing Order	1-5-3-6-2-4
Combustion System	HPCR
Engine Type	In-line, 4-Cycle
Aspiration	Turbocharged
Charge Air Cooling System	Air-to-Air
Engine Crankcase Vent System	Open

Physical Data

Length--in. (mm)	47.6 (1208)
Width--in. (mm)	24.8 (630)
Height--in. (mm)	43.8 (1113)
Weight, dry--lb (kg)	1986 (901)
(Includes flywheel housing, flywheel & electrics)	
Center of Gravity Location	
From Rear Face of Block(X-axis)--in.(mm)	17.1 (434.4)
Right of Crankshaft (Y-axis)--in. (mm)	0.1 (2.2)
Above Crankshaft (Z-axis)--in. (mm)	7.9 (201.4)
Maximum Allowable Static Bending Moment at Rear Face of Flywhl Hsg w/ 5-G Load--lb-ft (N•m)	600 (814)

Thrust Bearing Load Limit --lb (N)	Forward	Rearward
Intermittent	2923 (13,000)	1349 (6000)
Continuous	1933 (8600)	899 (4000)

Max. Front of Crank. Torsional Vibration--DDA	0.25
Max. Continuous Damper Temp--°F (°C)	180 (82)

Electrical System

	12 Volt	24 Volt
Min. Battery Capacity (CCA)--amp	1100	750
Max. Allow. Starting Circuit Resist.--Ohm	0.0012	0.002
Starter Rolling Current		
At 32 °F (0 °C)--amp	920	600
At -22 °F (-30 °C)--amp	1300	700
Min. Voltage at ECU during Cranking--volts	6	10

Maximum ECU Temperature--°F (°C)	221 (105)
Max. VTG Actuator Surface Temp.--°F (°C)	356 (180)
Maximum Harness Temperature--°F (°C)	257 (125)

Air System

Maximum Allowable Temp Rise--Ambient Air to Engine Inlet--°F (°C)	15 (8)
Maximum Air Intake Restriction:	
Dirty Air Cleaner--in. H_2O (kPa)	25 (6.25)
Clean Air Cleaner--in. H_2O (kPa)	15 (3.75)
Engine Air Flow--ft^3/min (m^3/min)	769 (21.77)
Air Cleaner Efficiency--%	99.9

Charge Air Cooling System

Air/Air Exch'r. Heat Rej.–Btu/min(kW)	3341 (58.7)
Compressor Discharge Temp.(Rated) @ 77 °F (25°C) Ambient Air--°F (°C)	386 (196.7)
Compressor Discharge Temp.(Max.) @ Peak Torque, 47°C ambient, 80 kPa barometer--°F (°C)	500 (260)
Max. Pressure Drop, thru CAC--in.H_2O (kPa)	64 (16)
Min. Pressure Drop, thru CAC--in.H_2O (kPa)	32 (8)
Intake Manifold Pressure--psi (kPa)	30 (209.8)
Max CAC Out Temp @ 77°F (25°C) Amb.--°F (°C)	127(53)
Min CAC Out Temp @ 77°F (25°C) Amb.--°F (°C)	114(45.7)
Max CAC Out Temp @ any Ambient--°F (°C)	190 (88)

Cooling System

Engine Heat Rejection--BTU/min (kW)	6557 (115.2)
Coolant Flow--gal/min (L/min)	103 (390)
Thermostat Start to Open--°F (°C)	180 (82)
Thermostat Fully Open--°F (°C)	201 (94)
Engine Coolant Capacity--qt (L)	17 (16)
Minimum Pressure Cap--psi (kPa)	14.5 (100)
Maximum Top Tank Temp--°F (°C)	230 (110)
Minimum Coolant Fill Rate--gal/min (L/min)	3 (12)
Minimum Air-to-Boil Temperature--°F (°C)	117 (47)
Minimum Pump Inlet Pressure--psi (kPa)	4.4 (30)
Max. Radiator System Restriction--in. H_2O (kPa)	5.6 (14)

Exhaust System

Exhaust Flow--ft^3/min (m^3/min)	1620 (46)
Exhaust Temperature--°F (°C)	728 (387)
Max. Allowable Back Pressure--in. H_2O (kPa)	40 (10)
Minimum Exhaust Restriction----in. H_2O (kPa)	16 (4)
Max. Bend. Moment on Turbo Out.--lb-ft (N•m)	5.2 (7)
Max. Shear on Turbo Outlet--lb (kg)	24 (11)

Fuel System

ECU Description	L14 Controller
Fuel Injection Pump	Denso HP4
Governor Type	Electronic
Total Fuel Flow--lb/hr (kg/hr)	450 (204.0)
Fuel Consumption--lb/hr (kg/hr)	112 (51.0)
Max. Fuel Inlet Temperature--°F (°C)	176 (80)
Fuel Temp. Rise, Inlet to Return--°F (°C)	91.8 (51)
Max. Fuel Inlet Restriction--in. H_2O (kPa)	80 (20)
Max. Fuel Inlet Pressure--in. H_2O (kPa)	80 (20)
Max. Fuel Return Pressure--in. H_2O (kPa)	80 (20)

Lubrication System

Oil Pressure at Rated Speed--psi (kPa)	42 (290)
Oil Pressure at Low Idle--psi (kPa)	25 (170)
Max. Oil Carryover in Blow-by--lb/hr (g/hr)	0.007 (3)
Max. Airflow in Blow-by--gal/min (l/min)	40 (150)
Max. Crankcase Pressure--in. H_2O (kPa)	2 (0.5)

Performance Data

Rated Power--hp (kW)	325 (242)
Rated Speed--rpm	2200
Breakaway Speed--rpm	2270
Fast Idle Speed--rpm	2420
Peak Torque--lb-ft (N•m)	1048 (1421)
Peak Torque Speed--rpm	1500
Low Idle Speed--rpm	800
BMEP--psi (kPa)	213 (1470)
Friction Power @ Rated Speed--hp (kW)	50 (37)
Altitude Capability--ft (m)	10,000 (3000)*
Ratio--Air : Fuel	28.4 : 1
Smoke @ Rated Speed--Bosch No.	0.67
Noise--dB(A) @ 1 m	NA
Power Bulge--%	0
Power Bulge Speed--rpm	NA
Torque Rise--%	35

Engine Speed rpm	Power hp (kW)	Torque lb-ft (N•m)	BSFC lb/hp-hr (g/kWh)
2200	325 (242)	776 (1053)	0.344 (210)
2000	325 (242)	854 (1158)	0.345 (210)
1800	325 (242)	949 (1287)	0.339 (207)
1600	312 (233)	1025 (1389)	0.328 (200)
1500	299 (223)	1048 (1421)	0.325 (198)
1400	278 (208)	1044 (1416)	0.320 (195)
1200	239 (178)	1044 (1416)	0.319 (194)
1000	199 (148)	1044 (1416)	0.333 (203)
800	142 (106)	932 (1263)	0.350 (213)

All values at rated speed and power with standard options unless otherwise noted.

* Revised Data

Curve: 6090HF485325_2200_0_35 ..... Sheet 2 of 2

July 2005

INDUSTRIAL DIESEL ENGINE

KUBOTA 05 SERIES (3-cylinder)

D1305-E3B

4 EPA Int.Tier

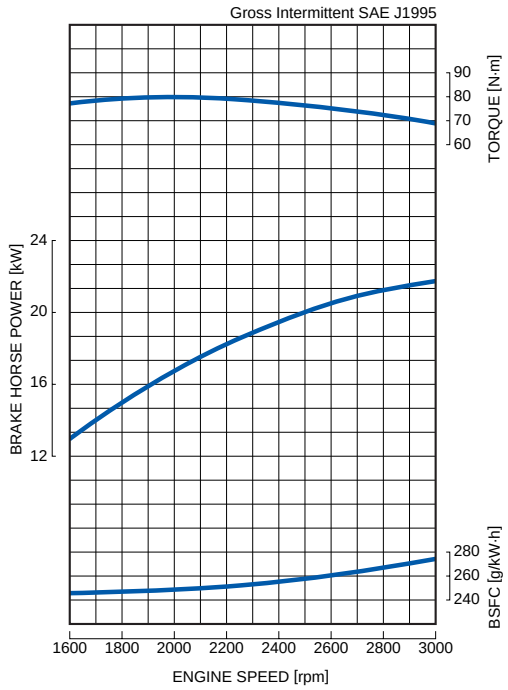
ⅢA EU Stage

RATED POWER

21.7kW@3000rpm

Photographs may show non-standard equipment.

PERFORMANCE CURVE



FEATURES and BENEFITS

Emissions

- The D1305 engine complies with EPA Interim Tier 4 emissions regulations that are effective through the end of 2012. This engine also complies with EU Stage ⅢA requirements that are effective through 2012 and beyond in the European market.

Durable Power

- The D1305 engine is a new high power density engine that delivers the highest output in a naturally aspirated 3-cylinder configuration within the Kubota 05 Series.
- By expanding the stroke, Kubota increased engine displacement by 12% compared to the D1105 while maintaining the same footprint. By adopting a shallow, large-capacity oil pan and extended gear case, the engine height is lower, providing a compact engine package.
- The cooling water passages between the cylinder bores, using Kubota's original casting technology as a countermeasure against heat load of high power density, provides both superior endurance and reliable engine characteristics.

Clean and Quiet Power

- Kubota's original E-TVCS (Three Vortex Combustion System) has been improved. The airflow, combustion chamber and piston recess were optimized to provide a 50% lower particulate matter (PM) level, the same stringent level as above the 37kW class (EPA Interim Tier 4 Option 1).
- The half-float valve cover and MoS_2 coated pistons reduce noise levels and provide reduced transmitted vibration from the valve area for better noise characteristics.

Option

- A variety of engine accessory options for the existing Kubota 05 series is also available for this engine.

D1305-E3B

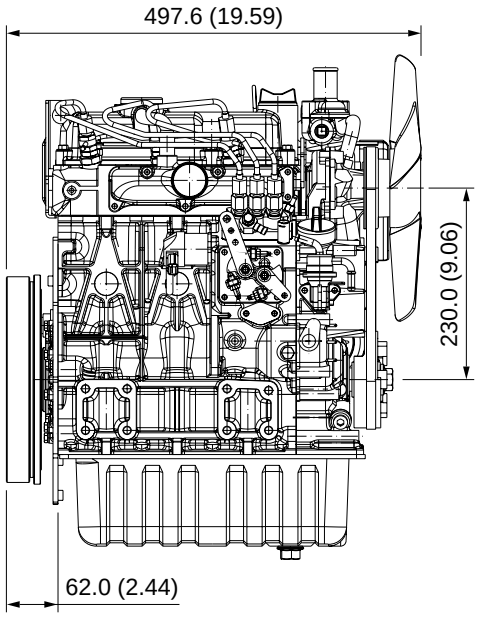
KUBOTA 05 SERIES

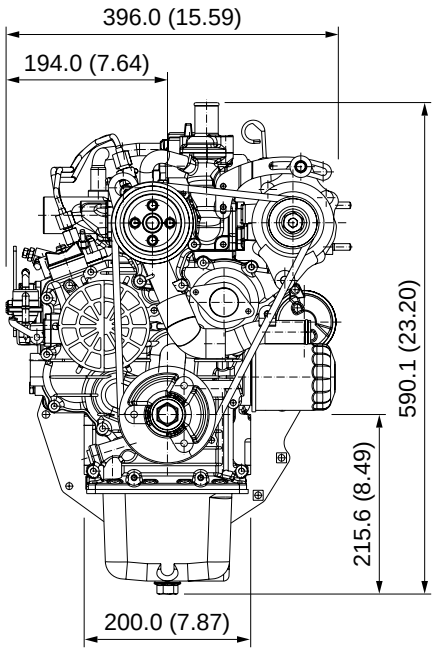
GENERAL SPECIFICATION

Model		D1305-E3B
Emission Regulation		Interim Tier 4 / Stage ⅢA
Type		Vertical 4-cycle Liquid Cooled Diesel
Number of Cylinders		3
Bore	mm (in)	78.0 (3.07)
Stroke	mm (in)	88.0 (3.46)
Displacement	L (cu.in)	1.261 (76.95)
Combustion System		IDI
Intake System		Naturally Aspirated
Maximum Speed	rpm	3000
Output: Gross Intermittent	kW	21.7
	hp	29.1
	ps	29.5
Direction of Rotation		Counterclockwise Viewed on Flywheel
Oil Pan Capacity	L (gal)	5.7 (1.51)
Starter Capacity	V-kW	12-1.2 [US] / 12-1.4 [EU]
Alternator Capacity	V-A	12-40
Length	mm (in)	497.6 (19.59)
Width	mm (in)	396.0 (15.59)
Height (1)	mm (in)	590.1 (23.20)
Height (2)	mm (in)	215.6 (8.49)
Dry Weight	kg (lb)	95.0 (209.4)

*Specification is subject to change without notice.
*Output: Gross Intermittent SAE J1995
*Dry weight is according to Kubota's standard specification.
When specification varies, the weight will vary accordingly.

DIMENSIONS





Kubota

Your Driving Force
KUBOTA ENGINE

KUBOTA Corporation
2-47, Shikitsuhigashi 1-chome, Naniwa-ku, Osaka, 556-8601 Japan
Fax: 06-6648-3521
http://www.engine.kubota.ne.jp

1311-01-COM '07.01. .STD

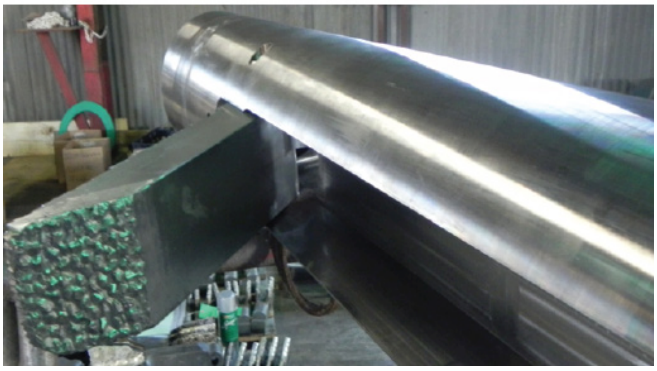
ABRADO
SEALED AND DELIVERED.
www.abrado.com

SCR-1000 | SECTION MILLING

PRODUCT DATA SHEET

PRODUCT DESCRIPTION

The SCR-1000™ is® a tool designed to enter a smaller casing or restricted ID casing sections and mill a larger outer casing string. The SCR-1000TM is placed at a pre-determined depth to perform a cut out, section mill, and potentionally under ream a window throughout the millng process. Milling fluids exit thru a jet nozzle inside of the piston body that continuously flushes and removes particles that may collect behind the blade assembly. Upon window completion, the SCR-1000TM cutter blades simply close when all pumping processes are disengaged. This allows ease of removal from the wellbore upon section million completion.



SCR-1000TM SECTION MILL SPECIFICATIONS			
BODY OD (IN.)	CASING OD (IN.)	APPROXIMATE WEIGHT (LBS.)	CONNECTION
57/8"	65/8"TO75/8"+	295	31/2"IF
63/8"	75/8"TO85/8"+	375	31/2"IF
83/8"	95/8"TO103/4"+	910	41/2"IF
11 3/4"	13 3/8" +	1,860	6 5/8" REG

OCEANEERING®

oceaneering.com

Internal Multi-String Cutting Tool

Superior conductor cutting capacity and speed

FEATURES

- **Superior cutting speed**
- **Vessel, drilling rig, or platform operations**
- **Cuts casings from 7 - 48 in with a single run**

01.05.17

Internal Multi-String Cutting Tool

Superior conductor cutting capacity and speed

The internal multi-string cutting tool (IMCT) is based on Oceaneering's powerful abrasive water jet cutting (AWJC) technology and cuts up to five layers of casings from the inside of a well in a single run. The AWJC method uses a high-energy jet of water-borne abrasive particles to cut the hardest steel alloys quickly and safely. The IMCT produces a clean cut and facilitates safe and easy conductor recovery.

Technical Data

Cutting medium	Water (salt or fresh) and environmentally friendly abrasives
Pressure	7,000-30,000 psi / 500-2,000 bar
Water flow rate	8-32 gal/min / 30-120 l/min
Typical utility requirements of vessel/ platform	Sea water required to operate equipment (32 gal/min @ 45 psi / 120 l/min @ 3 bar) Fresh water for cleaning Crane (15T capacity) and rigging assistance for handling of equipment Electric power (110 V and 220 V) Available compressor work air onboard the rig/vessel
Typical footprint/deck space requirement	Approximately 1,000 ft^2 / 100 m^2

Equipment	Inner casing outer diameter	Tool dimensions (OD/L)	Tool weight (in air)
IMCT 700	7 in and 7 ⅝ in	5.8 in / 77.6 in | 0.15 m / 1.97 m	330 lb / 150 kg
IMCT 958	9 ⅝ in to 20 in	8.3 in / 79.1 in | 0.21 m / 2.01 m	462 lb / 210 kg

Additional versions available upon request.

Typical Complete System Equipment List

Equipment	Quantity	Equipment weight	Dimensions (LxWxH)
High pressure water pump	1*	15,000 lb / 6,800 kg	171 x 77 x 99 in / 4.3 x 2.0 x 2.5 m
Abrasive mixer unit (AMU) inclusive of hopper (hopper and AMU main unit are transported as individual components)	1*	28,660 lb / 13,000 kg	76 x 76 x 200 in / 1.9 x 1.9 x 5.1 m
7 in IMCT, including body, internals, cutting head, and nozzle	2	595 lb / 270 kg	85 x 32 x 27 in / 2.2 x 0.8 x 0.7 m
Deployment skid with winches	1	17,000 lb / 7,800 kg	146 x 100 x 118 in / 3.7 x 2.5 x 2.9 m
Hydraulic power unit	1	4,100 lb / 1,500 kg	100 x 45 x 62 in / 2.6 x 1.2 x 1.6 m
Air compressor	1	13,000 lb / 5,900 kg	168 x 88 x 79 in / 4.2 x 2.2 x 2.0 m
Control and workshop container	1	10,000 lb / 4,500 kg	192 x 96 x 102 in / 4.9 x 2.4 x 2.6 m
Transport basket (accommodates 2 IMCTs)	1	4,000 lb / 1,818 kg	228 x 65 x 53 in / 5.8 x 1.6 x 1.3 m

*Back-up recommended.

APPENDIX B

MSDS Sheet for Sharpshot© Iron Silicate Abrasive

SAFETY DATA SHEET

Section 1. IDENTIFICATION

PRODUCT: SHARPSHOT® Iron Silicate Abrasives

Composition: Iron Silicate (Complex silicates and oxides of iron, silica, calcium, and aluminum)
Product Use: Abrasive air-blasting media

Manufacturer: Minerals Research, Inc.
4620 South Coach Drive
Tucson, Arizona 85714

Creation Date: 3/16
Revision Date:

For Additional Information, Contact:
Minerals Research, Inc.
(520) 748-9362 Phone
(520) 748-9364 Fax

Section 2: HAZARDS IDENTIFICATION

Proper precautions should be taken to avoid any health hazard. A health hazard may occur if limits for air contaminants exceed PEL limits as per 29 CFR 1910.1000. Proper engineering controls and ventilation should be used to prevent air contaminants from exceeding PEL limits. NIOSH-approved respirators should be used during all abrasive blasting operations. (See below for information on potentially hazardous elements)

Usual Route (s) of Entry: Inhalation of dust during handling or use
Medical Conditions Possibly Aggravated By Exposure: Chronic diseases or disorders of the respiratory system.

Please note that this product may contain the following chemical components in quantities less than 1% by weight. Under extreme conditions (e.g. sandblasting in a confined space without sufficient ventilation), OSHA PELs or ACGIH TLV's could be exceeded. In these situations, employee exposure monitoring should be performed to determine exposure levels.

Component	CAS #	Fed OSHA PEL (mg/m^3)	CA OSHA PEL (mg/m^3)	ACGIH TLV (mg/m^3)
Arsenic (As)	7440-38-2	0.01	0.01	0.01
Cadmium (Cd)	7440-43-9	0.2	0.2	0.01
Chromium (Cr)	7440-47-3	1	0.5	0.5
Cobalt (Co)	7440-48-4	0.1	0.02	0.02
Copper (Cu)	7440-50-8	1	0.1	1
Lead (Pb)	7439-92-11	0.05	0.05	0.05
Mercury (Hg)	7439-97-6	-	-	0.1 (skin)
Molybdenum (Mo)	7439-98-7	15	10 (inh); 3 (resp)	10 (inh); 3 (resp)

Selenium (Se)	7782-49-2	0.2	0.2	0.2
Vanadium (Vn)	1314-62-1	0.5 (resp)	0.05 (resp)	0.05 (resp)
Zinc (Zn)	1314-13-2	5 (resp)	5 (resp)	2 (resp)
Crystalline Silica (SiO_2)	480-86-07	14.2 (resp = 4.7)	0.3 (resp = 0.1)	0.05 (resp)

Section 3: COMPOSITION/INFORMATION ON INGREDIENTS

Composition: Iron Silicate (complex silicates and oxides of iron, silica, calcium, and aluminum)

Component	CAS #	Typical % Weight
Iron Oxide (Fe_2O_3)	1309-37-1	40-50
Silicates (amorph. SiO_2)	7440-21-3	35-45
Alpha-Alumina (Al_2O_3)	1344-28-1	5-10
Calcium oxide (CaO)	1305-78-8	3-8
Magnesium oxide (MgO)	1309-48-4	1-3
Potassium oxide (K_2O)	12136-45-7	<1

Please note that this product may contain the following chemical components in quantities less than 1% by weight.

Component	CAS #	Typical % Weight
Arsenic (As)	7440-38-2	<0.007
Barium (Ba)	7440-39-3	<0.005
Cadmium (Cd)	7440-43-9	<0.0008
Chromium (Cr)	7440-47-3	<0.0012
Cobalt (Co)	7440-48-4	<0.004
Copper (Cu)	7440-50-8	<0.18
Lead (Pb)	7439-92-11	<0.009
Molybdenum (Mo)	7439-98-7	<0.0005
Selenium (Se)	7782-49-2	<0.001
Vanadium (Vn)	1314-62-1	<0.003
Zinc (Zn)	1314-13-2	<1
Crystalline Silica (SiO_2)	480-86-07	<0.5

Footnotes:

(1) See last page for important additional terms and conditions including disclaimer of warranties.

(2) Concentration may vary somewhat between batches or lots. Where possible, a concentration range is indicated. Occasionally, however, levels may even fall outside of the typical concentration range.

Section 4: FIRST AID MEASURES

Eye Contact: Not anticipated to pose an acute or significant eye contact hazard. In the event of eye contact, flush eyes with generous amounts of water.

Skin Contact: Not anticipated to pose an acute or significant skin contact hazard. Wash with soap and water as needed to remove from skin

Inhalation: Not anticipated to pose an acute or significant inhalation hazard if proper work practices are employed to maintain dust exposure below OSHA PEL's. If overexposure occurs, remove individual to area with fresh air until symptoms cease.

Ingestion: Not considered to be an ingestion hazard.

Section 5: FIRE FIGHTING MEASURES

Flash Point:	NA	Lower Explosive Limit:	NA
Auto-ignition Temperature:	NA	Upper Explosive Limit:	NA
Fire Hazard:	NA	Explosion Hazard:	NA
Extinguishing Media:	NA	Special Fire Fighting Procedures:	NA
Unusual Fire and Explosion Hazards:	NA		

Section 6: ACCIDENTAL RELEASE MEASURES

Procedures to Follow if Material is Released or Spilled: Using appropriate personnel protective equipment, material should be swept or vacuumed or otherwise collected into appropriate containers. Waste Disposal Method(s): Landfill disposal or other methods that are in accordance with local, state and federal regulations. MRI testing has shown that virgin (unused and uncontaminated) material does not exceed the Toxicity Characteristic Leaching Procedure (TCLP) hazardous waste limits per 40 CFR 261.3. Used or contaminated material should be tested in accordance with 40 CFR 262.11 or any applicable local or state regulations to determine if it is a hazardous waste and disposed of accordingly.

Section 7: HANDLING AND STORAGE

Handling Procedures: Use care to minimize airborne dust generation during handling, and use adequate ventilation and/or dust collection.

Storage: Keep product dry - store product indoors or cover completely to protect from moisture prior to use. Wet material will cause clumping and clogging of abrasive blasting equipment.

Section 8: EXPOSURE CONTROL/PERSONAL PROTECTION

Engineering Controls (Ventilation, etc.) : Ventilation should be sufficient to maintain dust levels below applicable exposure limit.
Work Practices (Handling and Storage, etc.): Avoid creating airborne dust during handling and use.
Eye Protection: Safety glasses, goggles or face shields are recommended during abrasive blasting or when dust levels are excessive.
Skin Protection: Gloves and long-sleeved clothing are recommended during abrasive blasting or when dust levels are excessive.
Respiratory Protection: When engineering controls are not sufficient to lower dust levels below the applicable exposure limit, use a NIOSH-approved respirator. NIOSH-approved respirators should be used during all abrasive blasting operations in accordance with 29 CFR 1910.134 (OSHA Respiratory Protection Program).

Component	CAS #	Typical % Weight	Fed OSHA PEL (mg/m^3)	CA OSHA PEL (mg/m^3)	ACGIH TLV (mg/m^3)
Iron Oxide (Fe_2O_3)	1309-37-1	40-50	10	5	5
Silicates (amorph. SiO_2)	7440-21-3	35-45	1.8	6 (resp = 3)	10
Alpha-Alumina (Al_2O_3)	1344-28-1	5-10	15 (resp =5)	10 (resp = 5)	1 (resp)
Calcium oxide (CaO)	1305-78-8	3-8	5	2	2
Magnesium oxide (MgO)	1309-48-4	1-3	15	10	10
Potassium oxide (K_2O)	12136-45-7	<1	15	10	10

Please note that this product may contain the following chemical components in quantities less than 1% by weight. Under certain conditions (e.g. sandblasting in a confined space without sufficient ventilation),

OSHA PELs or ACGIH TLV's could be exceeded. In these situations, employee exposure monitoring should be performed to determine exposure levels.

Component	CAS #	Fed OSHA PEL (mg/m^3)	CA OSHA PEL (mg/m^3)	ACGIH TLV (mg/m^3)
Arsenic (As)	7440-38-2	0.01	0.01	0.01
Cadmium (Cd)	7440-43-9	0.2	0.2	0.01
Chromium (Cr)	7440-47-3	1	0.5	0.5
Cobalt (Co)	7440-48-4	0.1	0.02	0.02
Copper (Cu)	7440-50-8	1	0.1	1
Lead (Pb)	7439-92-11	0.05	0.05	0.05
Mercury (Hg)	7439-97-6	-	-	0.1 (skin)
Molybdenum (Mo)	7439-98-7	15	10 (inh); 3 (resp)	10 (inh); 3 (resp)
Selenium (Se)	7782-49-2	0.2	0.2	0.2
Vanadium (Vn)	1314-62-1	0.5 (resp)	0.05 (resp)	0.05 (resp)
Zinc (Zn)	1314-13-2	5 (resp)	5 (resp)	2 (resp)
Crystalline Silica (SiO_2)	480-86-07	14.2 (resp = 4.7)	0.3 (resp = 0.1)	0.05 (resp)

Footnotes:
(1) See last page for important additional terms and conditions including disclaimer of warranties.
(2) Concentration may vary somewhat between batches or lots. Where possible, a concentration range is indicated. Occasionally, however, levels may even fall outside of the typical concentration range.

Section 9: PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Granular	Bulk Density (loose):	110 - 120 lbs/ft^3
Specific Gravity:	3.4 - 3.6	pH:	NA
Appearance/ Odor:	Dull Black, Odorless	Vapor Pressure:	NA
Boiling Point:	NA	Vapor Density:	NA
Melting Point:	Over 2000º F	Evaporation Rate:	NA

Section 10: REACTIVITY DATA

Stability:	Stable
Incompatibilities (Materials to Avoid):	Strong mineral acids
Hazardous Thermal Decomposition Products:	None Expected
Polymerization:	Will not occur

Section 11: TOXICOLOGICAL INFORMATION

Proper precautions should be taken to avoid any health hazard. A health hazard may occur if limits for air contaminants exceed PEL limits as per 29 CFR 1910.1000. Proper engineering controls and ventilation should be used to prevent air contaminants from exceeding PEL limits. NIOSH-approved respirators should be used during all abrasive blasting operations. (See below for information on potentially hazardous elements)

Usual Route (s) of Entry:	Inhalation of dust during handling or use
Medical Conditions Possibly Aggravated By Exposure:	Chronic diseases or disorders of the respiratory system.

Iron silicate is not listed on the NTP, IARC, or OSHA list of carcinogens. However, please note that this product may contain chemical components that under certain conditions (e.g. sandblasting in a confined space without sufficient ventilation), could be released in concentrations that exceed OSHA PELs or ACGIH TLV's. In these situations, employee exposure monitoring should be performed to determine exposure levels.

Eye Contact: Not anticipated to pose an acute or significant eye contact hazard. In the event of eye contact, flush eyes with generous amounts of water.

Skin Contact: Not anticipated to pose an acute or significant skin contact hazard. Wash with soap and water as needed to remove from skin

Inhalation: Not anticipated to pose an acute or significant inhalation hazard if proper work practices are employed to maintain dust exposure below OSHA PEL's. If overexposure occurs, remove individual to area with fresh air until symptoms cease.

Ingestion: Not considered to be an ingestion hazard.

Section 12: ECOLOGICAL INFORMATION

Procedures to Follow if Material is Released or Spilled: Using appropriate personnel protective equipment, material should be shoveled, swept, vacuumed or otherwise collected into appropriate containers.

Landfill disposal or other methods that are in accordance with local, state and federal regulations. MRI testing as shown that virgin (unused and uncontaminated) material does not exceed the Toxicity Characteristic Leaching Procedure (TCLP) hazardous waste limits per 40 CFR 261.3. Used or contaminated material should be tested in accordance with 40 CFR 262.11 or any applicable local or state regulations to determine if it is a hazardous waste and disposed of accordingly.

Section 13: DISPOSAL CONSIDERATIONS

Landfill disposal or other methods that are in accordance with local, state and federal regulations. MRI testing as shown that virgin (unused and uncontaminated) material does not exceed the Toxicity Characteristic Leaching Procedure (TCLP) hazardous waste limits per 40 CFR 261.3. SHARPSHOT® iron silicate abrasives are listed as approved products on the US Navy's Qualified Products List QPL-22262. However, it should be noted that virgin SHARPSHOT® may exceed the soluble zinc limit of 50 mg/L as currently listed in MIL-A-22262 when tested in accordance with California's Title 22 STLC procedure. Used or contaminated material should be tested in accordance with 40 CFR 262.11 or any applicable local or state regulations to determine if it is a hazardous waste and disposed of accordingly.

Section 14: TRANSPORT INFORMATION

DOT

Not regulated as a hazardous material by DOT.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

TDG

Not regulated as dangerous goods.

Section 15: REGULATORY INFORMATION

See above

Section 16: OTHER INFORMATION

If material is being used for abrasive air blasting, proper protective clothing, eye protection and respiratory protection should be used in accordance with OSHA regulations. If air blasting is being performed in confined area, proper ventilation should be used in accordance with OSHA regulations.

NFPA Ratings:

Abbreviations:
NA = Not Applicable

DISCLAIMER OF EXPRESSED AND IMPLIED WARRANTIES

We believe that Minerals Research, Inc.'s (MRI) SHARPSHOT® iron silicate products are not hazardous chemicals as defined by the U.S. Federal Occupational Safety and Health Hazard Communication Standard 29 CFR 1910.1200 (c). However, this should not be construed as a warranty that any MRI product is or is not a hazardous chemical under any applicable safety, or environmental statute, rule, or regulation. The use or application of any MRI product, whether or not used in conjunction with any other product, may result in the violation of safety or environmental statutes, rules or regulations as MRI has no control over how the MRI product is used, nor the possible contaminants that may exist on the surface to which it is applied. Therefore, there shall be no express or implied warranty that the spent MRI product conforms with applicable safety and/or environmental statutes, rules or regulation. All sales of this product are subject to MRI's standard terms and conditions of sale. Further, MRI makes no warranties as to any of its products, express or implied, including the Implied Warranty of Merchantability, any implied warranty of fitness for a particular purpose or any implied warranties otherwise arising from course of dealing or trade.

By acceptance of any MRI product, the buyer thereof agrees that MRI's liability for any claim for damages, including, but not limited to, remediation or cleanup costs shall not exceed the value of the goods provided.

This information and product are furnished on the condition that the person receiving them shall make his own determination as to the suitability of the product for his particular purpose and on the condition that he assume the risk of his use thereof, including any environmental restrictions or prohibitions that may apply.

SDS Creation Date: 03/16

APPENDIX C

Air Emissions Estimates

Platform Grace Conductor Removal Program: POLB Disposal
Criteria Pollutants

OFF-ROAD SOURCES

						Emission Factors: g/BHP-hr [2]					Peak Day Pounds						English Tons				
Source	Fuel	BHP	Number	Load Factor[1]	Peak Day Hours	NO_x	ROG	PM10	SOx	CO	NO_x	ROG	PM10	SOx	CO	Total Days	NO_x	ROG	PM10	SOx	CO
Jacking and Pulling Unit																					
Cummins QSK 19-Tier 4	Diesel	760	1	50	8	1.50	0.14	0.02	0.005	2.60	10.05	0.94	0.13	0.03	17.43	90	0.45	0.04	0.01	0.002	0.78
Air compressor-Tier 4	Diesel	300	1	48	8	1.50	0.14	0.02	0.005	2.60	3.81	0.36	0.05	0.01	6.60	90	0.17	0.02	0.00	0.001	0.30
Abrasive Water Jet																					
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	7	3.00	1.12	0.15	0.005	2.60	11.13	4.16	0.56	0.02	9.65	28	0.16	0.06	0.01	0.000	0.14
Hydraulic power unit-Kubota D1305-E3B (Tier 4)	Diesel	29	1	48	7	1.50	0.14	0.02	0.005	2.60	0.32	0.03	0.00	0.00	0.56	28	0.00	0.00	0.00	0.000	0.01
Air compressor-Tier 3	Diesel	500	1	48	7	3.00	1.12	0.15	0.005	2.60	11.11	4.15	0.56	0.02	9.63	28	0.16	0.06	0.01	0.000	0.13
Drill Pin Sever																					
Hydraulic power unit (Tier 3)	Diesel	200	1	48	12	3.00	1.12	0.15	0.005	2.60	7.62	2.84	0.38	0.01	6.60	90	0.34	0.13	0.02	0.001	0.30
Marine Growth Removal																					
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	8	3.00	1.12	0.15	0.005	2.60	12.72	4.75	0.64	0.02	11.03	90	0.57	0.21	0.03	0.001	0.50
Transportation & Disposal																					
Adele Elise mains-Caterpillar 3516 (Tier 2): Ventura Co.	Diesel	2000	2	65	3.3	8.40	1.06	1.02	0.005	3.70	158.89	20.05	19.29	0.09	69.99	32	2.54	0.32	0.31	0.002	1.12
Adele Elise bowthruster-Cummins QSK 19M (Tier 2): Ventura Co.	Diesel	660	1	50	0.5	8.40	1.06	1.02	0.005	3.70	3.06	0.39	0.37	0.00	1.35	32	0.05	0.01	0.01	0.000	0.02
Adele Elise generators-Cummins QSK19M (Tier 2): Ventura Co.	Diesel	660	2	50	3.3	8.40	1.06	1.02	0.005	3.70	40.33	5.09	4.90	0.02	17.77	32	0.65	0.08	0.08	0.000	0.28
Adele Elise mains-Caterpillar 3516 (Tier 2): LA Co.	Diesel	2000	2	65	5.9	8.40	1.06	1.02	0.005	3.70	284.07	35.85	34.49	0.17	125.13	32	4.55	0.57	0.55	0.003	2.00
Adele Elise bowthruster-Cummins QSK 19M (Tier 2): LA Co.	Diesel	660	1	50	0.5	8.40	1.06	1.02	0.005	3.70	3.06	0.39	0.37	0.00	1.35	32	0.05	0.01	0.01	0.000	0.02
Adele Elise generators-Cummins QSK19M (Tier 2): LA Co.	Diesel	660	2	50	5.9	8.40	1.06	1.02	0.005	3.70	72.11	9.10	8.76	0.04	31.76	32	1.15	0.15	0.14	0.001	0.51
Platform crane-GM 8V92[5]: Ventura Co.	Diesel	300	1	29	8	3.95	0.28	0.28	0.060	0.86	6.06	0.43	0.43	0.09	1.32	5.8	0.02	0.00	0.00	0.000	0.00
											624.35	88.51	70.93	0.54	310.15		10.86	1.65	1.16	0.01	6.11

ON-ROAD SOURCES

			Emission Factors, Input [3]					Peak Pounds/Day						Tons				
On Road Sources	Miles/Round Trip	Round Trips/Day	NO_x g/mile	ROG g/mile	PM10 g/mile	SO_x g/mile	CO g/mile	NO_x	ROG	PM10	SO_x	CO	Days[4]	NO_x	ROG	PM10	SO_x	CO
Flatbed Truck (T6 instate contruction heavy)	0	0	3.24	0.133	0.074	0.009	0.484	0.00	0.00	0.00	0.00	0.00	0	0.000	0.000	0.000	0.000	0.000
						Ventura Co. Totals =>		**265.11**	**43.18**	**27.31**	**0.33**	**151.92**	Totals =>	**5.11**	**0.93**	**0.46**	**0.006**	**3.58**
						LA Co. Totals =>		**359.24**	**45.33**	**43.62**	**0.21**	**158.24**		**5.75**	**0.73**	**0.70**	**0.003**	**2.53**

Notes:

[1] Load Factors (except vessels) derived from CalEEMod, 2016 Appendix D - Default Data Tables, Table 3.3 OFFROAD Default Horsepower and Load Factors

[2] Emission factors from BOEM Air Emissions Associated with Decommissioning Operations for Pacific Outer Continental Shelf Oil and Gas Platforms; Table B-3

[3] Truck emissions factors from EMFAC 2017, Ventura County, year 2021

[4] Based on total trips/peak day trips

[5] Crane emissions factors based on the Part 70 Permit no. 01493, hours based on 8 hour peak day and 46 total hours (5.8 days)

Adele Elise peak day hours based on one 9.2 hour trip to Long Beach, total days based on 32 one-way trips

Crewboat trips would not increase from the current two trips per day

Platform Grace Conductor Removal Program: Saticoy Disposal
Criteria Pollutants

OFF-ROAD SOURCES

						Emission Factors: g/BHP-hr [2]					Peak Day Pounds						English Tons				
Source	Fuel	BHP	Number	Load Factor[1]	Peak Day Hours	NO_x	ROG	PM10	SOx	CO	NO_x	ROG	PM10	SOx	CO	Total Days	NO_x	ROG	PM10	SOx	CO
Jacking and Pulling Unit																					
Cummins QSK 19-Tier 4	Diesel	760	1	50	8	1.50	0.14	0.02	0.005	2.60	10.05	0.94	0.13	0.03	17.43	90	0.45	0.04	0.01	0.002	0.78
Air compressor-Tier 4	Diesel	300	1	48	8	1.50	0.14	0.02	0.005	2.60	3.81	0.36	0.05	0.01	6.60	90	0.17	0.02	0.00	0.001	0.30
Abrasive Water Jet																					
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	7	3.00	1.12	0.15	0.005	2.60	11.13	4.16	0.56	0.02	9.65	28	0.16	0.06	0.01	0.000	0.14
Hydraulic power unit-Kubota D1305-E3B (Tier 4)	Diesel	29	1	48	7	1.50	0.14	0.02	0.005	2.60	0.32	0.03	0.00	0.00	0.56	28	0.00	0.00	0.00	0.000	0.01
Air compressor-Tier 3	Diesel	500	1	48	7	3.00	1.12	0.15	0.005	2.60	11.11	4.15	0.56	0.02	9.63	28	0.16	0.06	0.01	0.000	0.13
Drill Pin Sever																					
Hydraulic power unit (Tier 3)	Diesel	200	1	48	12	3.00	1.12	0.15	0.005	2.60	7.62	2.84	0.38	0.01	6.60	90	0.34	0.13	0.02	0.001	0.30
Marine Growth Removal																					
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	8	3.00	1.12	0.15	0.005	2.60	12.72	4.75	0.64	0.02	11.03	90	0.57	0.21	0.03	0.001	0.50
Transportation & Disposal																					
Adele Elise mains-Caterpillar 3516 (Tier 2)	Diesel	2000	2	65	2.25	8.40	1.06	1.02	0.005	3.70	108.33	13.67	13.15	0.06	47.72	32	1.73	0.22	0.21	0.001	0.76
Adele Elise bowthruster-Cummins QSK 19M (Tier 2)	Diesel	660	1	50	1	8.40	1.06	1.02	0.005	3.70	6.11	0.77	0.74	0.00	2.69	32	0.10	0.01	0.01	0.000	0.04
Adele Elise generators-Cummins QSK 19M (Tier 2)	Diesel	660	2	50	2.25	8.40	1.06	1.02	0.005	3.70	27.50	3.47	3.34	0.02	12.11	32	0.44	0.06	0.05	0.000	0.19
Platform crane-GM 8V92[5]: Ventura Co.	Diesel	300	1	29	8	3.95	0.28	0.28	0.060	0.86	6.06	0.43	0.43	0.09	1.32	5.8	0.02	0.00	0.00	0.000	0.00
											204.78	35.57	19.98	0.29	125.34		4.14	0.80	0.35	0.01	3.16

ON-ROAD SOURCES

			Emission Factors, Input [3]					Peak Pounds/Day						Tons				
On Road Sources	Miles/Round Trip	Round Trips/Day	NO_x g/mile	ROG g/mile	PM10 g/mile	SO_x g/mile	CO g/mile	NO_x	ROG	PM10	SO_x	CO	Days[4]	NO_x	ROG	PM10	SO_x	CO
Flatbed Truck (T6 in-state construction heavy)	25	10	3.24	0.133	0.074	0.009	0.484	1.79	0.07	0.04	0.00	0.27	12.5	0.011	0.000	0.000	0.000	0.002
							Totals =>	**206.56**	**35.64**	**20.03**	**0.30**	**125.61**	**Totals =>**	**4.16**	**0.80**	**0.35**	**0.006**	**3.16**

Notes:

[1] Load Factors (except vessels) derived from CalEEMod, 2016 Appendix D - Default Data Tables, Table 3.3 OFFROAD Default Horsepower and Load Factors

[2] Emission factors from BOEM Air Emissions Associated with Decommissioning Operations for Pacific Outer Continental Shelf Oil and Gas Platforms; Table B-3

[3] Truck emissions factors from EMFAC 2017, Ventura County, year 2021

[4] Based on total trips/peak day trips

[5] Crane emissions factors based on the Part 70 Permit no. 01493, hours based on 8 hour peak day and 46 total hours (5.8 days)

Adele Elise peak day hours based on one 2.25 hour trip to Port Hueneme, total days based on 32 one-way trips

Crewboat trips would not increase from the current two trips per day

Platform Gail Conductor Removal Program: POLB Disposal
Criteria Pollutants

OFF-ROAD SOURCES

						Emission Factors: g/BHP-hr [2]					Peak Day Pounds						English Tons				
Source	Fuel	BHP	Number	Load Factor[1]	Peak Day Hours	NO_x	ROG	PM10	SOx	CO	NO_x	ROG	PM10	SOx	CO	Total Days	NO_x	ROG	PM10	SOx	CO
Jacking and Pulling Unit																					
Cummins QSK 19-Tier 4	Diesel	760	1	50	8	1.50	0.14	0.02	0.005	2.60	10.05	0.94	0.13	0.03	17.43	180	0.90	0.08	0.01	0.003	1.57
CMT pump -Tier 3	Diesel	300	1	74	24	3.00	1.12	0.15	0.005	2.60	35.24	13.16	1.76	0.06	30.54	28	0.49	0.18	0.02	0.001	0.43
Air compressor-Tier 4	Diesel	300	1	48	8	1.50	0.14	0.02	0.005	2.60	3.81	0.36	0.05	0.01	6.60	180	0.34	0.03	0.00	0.001	0.59
Abrasive Water Jet																					
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	0	3.00	1.12	0.15	0.005	2.60	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.000	0.00
Hydraulic power unit-Kubota D1305-E3B (Tier 4)	Diesel	29	1	48	0	1.50	0.14	0.02	0.005	2.60	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.000	0.00
Air compressor-Tier 3	Diesel	500	1	48	0	3.00	1.12	0.15	0.005	2.60	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.000	0.00
Drill Pin Sever																					
Hydraulic power unit (Tier 3)	Diesel	200	1	48	12	3.00	1.12	0.15	0.005	2.60	7.62	2.84	0.38	0.01	6.60	180	0.69	0.26	0.03	0.001	0.59
Marine Growth Removal																					
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	8	3.00	1.12	0.15	0.005	2.60	12.72	4.75	0.64	0.02	11.03	180	1.15	0.43	0.06	0.002	0.99
Transportation & Disposal																					
Adele Elise mains-Caterpillar 3516 (Tier 2): Ventura Co.	Diesel	2000	2	65	2.7	8.40	1.06	1.02	0.005	3.70	130.00	16.40	15.79	0.08	57.26	64	4.16	0.52	0.51	0.002	1.83
Adele Elise bowthruster-Cummins QSK 19M (Tier 2): Ventura Co.	Diesel	660	1	50	0.5	8.40	1.06	1.02	0.005	3.70	3.06	0.39	0.37	0.00	1.35	64	0.10	0.01	0.01	0.000	0.04
Adele Elise generators-Cummins QSK 19M (Tier 2): Ventura Co.	Diesel	660	2	50	2.7	8.40	1.06	1.02	0.005	3.70	33.00	4.16	4.01	0.02	14.54	64	1.06	0.13	0.13	0.001	0.47
Adele Elise mains-Caterpillar 3516 (Tier 2): LA Co.	Diesel	2000	2	65	5.9	8.40	1.06	1.02	0.005	3.70	284.07	35.85	34.49	0.17	125.13	64	9.09	1.15	1.10	0.005	4.00
Adele Elise bowthruster-Cummins QSK 19M (Tier 2): LA Co.	Diesel	660	1	50	0.5	8.40	1.06	1.02	0.005	3.70	3.06	0.39	0.37	0.00	1.35	64	0.10	0.01	0.01	0.000	0.04
Adele Elise generators-Cummins QSK 19M (Tier 2): LA Co.	Diesel	660	2	50	5.9	8.40	1.06	1.02	0.005	3.70	72.11	9.10	8.76	0.04	31.76	64	2.31	0.29	0.28	0.001	1.02
Platform crane-Caterpillar[5]: Ventura Co.	Diesel	545	1	29	8	3.95	0.28	0.28	0.060	0.86	11.01	0.78	0.78	0.17	2.40	9.4	0.05	0.00	0.00	0.001	0.01
											605.75	89.11	67.53	0.62	305.98		20.43	3.11	2.18	0.02	11.59

ON-ROAD SOURCES

			Emission Factors, Input [3]					Peak Pounds/Day						Tons				
			NO_x	ROG	PM10	SO_x	CO											
On Road Sources	Miles/Round Trip	Round Trips/Day	g/mile	g/mile	g/mile	g/mile	g/mile	NO_x	ROG	PM10	SO_x	CO	Days[4]	NO_x	ROG	PM10	SO_x	CO
Flatbed Truck (T6 instate contruction heavy)	0	0	1.21	0.0096	0.0069	0.008	0.071	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.000	0.00
							Ventura Co. Totals =>	**246.51**	**43.78**	**23.91**	**0.40**	**147.74**	Totals =>	**8.94**	**1.66**	**0.78**	**0.012**	**6.53**
							LA Co. Totals =>	**359.24**	**45.33**	**43.62**	**0.21**	**158.24**		**11.50**	**1.45**	**1.40**	**0.007**	**5.06**

Notes:

[1] Load Factors (except vessels) derived from CalEEMod, 2016 Appendix D - Default Data Tables, Table 3.3 OFFROAD Default Horsepower and Load Factors

[2] Emission factors from BOEM Air Emissions Associated with Decommissioning Operations for Pacific Outer Continental Shelf Oil and Gas Platforms; Table B-3

[3] Truck emissions factors from EMFAC 2017, Ventura County, year 2023

[4] Based on total trips/peak day trips

[5] Crane emissions factors based on the Part 70 Permit no. 01494, hours based on 8 hour peak day and 75 total hours (9.4 days)

Adele Elise peak day hours based on one 8.6 hour trip to Long Beach, total days based on 64 one-way trips

Platform Gail Conductor Removal Program: Saticoy Disposal
Criteria Pollutants

OFF-ROAD SOURCES

						Emission Factors: g/BHP-hr [2]					Peak Day Pounds						English Tons				
Source	Fuel	BHP	Number	Load Factor[1]	Peak Day Hours	NO_x	ROG	PM10	SOx	CO	NO_x	ROG	PM10	SOx	CO	Total Days	NO_x	ROG	PM10	SOx	CO
Jacking and Pulling Unit																					
Cummins QSK 19-Tier 4	Diesel	760	1	50	8	1.50	0.14	0.02	0.005	2.60	10.05	0.94	0.13	0.03	17.43	180	0.90	0.08	0.01	0.003	1.57
CMT pump -Tier 3	Diesel	300	1	74	24	3.00	1.12	0.15	0.005	2.60	35.24	13.16	1.76	0.06	30.54	28	0.49	0.18	0.02	0.001	0.43
Air compressor-Tier 4	Diesel	300	1	48	8	1.50	0.14	0.02	0.005	2.60	3.81	0.36	0.05	0.01	6.60	180	0.34	0.03	0.00	0.001	0.59
Abrasive Water Jet																					
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	0	3.00	1.12	0.15	0.005	2.60	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.000	0.00
Hydraulic power unit-Kubota D1305-E3B (Tier 4)	Diesel	29	1	48	0	1.50	0.14	0.02	0.005	2.60	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.000	0.00
Air compressor-Tier 3	Diesel	500	1	48	0	3.00	1.12	0.15	0.005	2.60	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.00	0.000	0.00
Drill Pin Sever																					
Hydraulic power unit (Tier 3)	Diesel	200	1	48	12	3.00	1.12	0.15	0.005	2.60	7.62	2.84	0.38	0.01	6.60	180	0.69	0.26	0.03	0.001	0.59
Marine Growth Removal																					
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	8	3.00	1.12	0.15	0.005	2.60	12.72	4.75	0.64	0.02	11.03	180	1.15	0.43	0.06	0.002	0.99
Transportation & Disposal																					
Adele Elise mains-Caterpillar 3516 (Tier 2)	Diesel	2000	2	65	1.7	8.40	1.06	1.02	0.005	3.70	81.85	10.33	9.94	0.05	36.05	64	2.62	0.33	0.32	0.002	1.15
Adele Elise bowthruster-Cummins QSK 19M (Tier 2)	Diesel	660	1	50	1	8.40	1.06	1.02	0.005	3.70	6.11	0.77	0.74	0.00	2.69	64	0.20	0.02	0.02	0.000	0.09
Adele Elise generators-Cummins QSK 19M (Tier 2)	Diesel	660	2	50	1.7	8.40	1.06	1.02	0.005	3.70	20.78	2.62	2.52	0.01	9.15	64	0.66	0.08	0.08	0.000	0.29
Platform crane-Caterpillar[5]: Ventura Co.	Diesel	545	1	29	8	3.95	0.28	0.28	0.060	0.86	11.01	0.78	0.78	0.17	2.40	9.4	0.05	0.00	0.00	0.001	0.01
											189.20	36.55	16.95	0.37	122.49		7.10	1.43	0.56	0.01	5.72

ON-ROAD SOURCES

			Emission Factors, Input [3]																	
			NO_x	ROG	PM10	SO_x	CO	Peak Pounds/Day						Tons					
On Road Sources	Miles/Round Trip	Round Trips/Day	g/mile	g/mile	g/mile	g/mile	g/mile	NO_x	ROG	PM10	SO_x	CO	Days[4]	NO_x	ROG	PM10	SO_x	CO
Flatbed Truck (T6 instate contruction heavy)	25	10	1.21	0.0096	0.0069	0.008	0.071	0.67	0.01	0.00	0.00	0.04	25	0.008	0.000	0.000	0.000	0.000
							Totals =>	**189.86**	**36.55**	**16.95**	**0.38**	**122.53**	**Totals =>**	**7.11**	**1.43**	**0.56**	**0.011**	**5.72**

Notes:

[1] Load Factors (except vessels) derived from CalEEMod, 2016 Appendix D - Default Data Tables, Table 3.3 OFFROAD Default Horsepower and Load Factors

[2] Emission factors from BOEM Air Emissions Associated with Decommissioning Operations for Pacific Outer Continental Shelf Oil and Gas Platforms; Table B-3

[3] Truck emissions factors from EMFAC 2017, Ventura County, year 2023

[4] Based on total trips/peak day trips

[5] Crane emissions factors based on the Part 70 Permit no. 01494, hours based on 8 hour peak day and 75 total hours (9.4 days)

Adele Elise peak day hours based on one 1.7 hour trip to Port Hueneme, total days based on 64 one-way trips

Gail_Saticoy

Distance (using shipping lanes, nm)			Ventura County (nm)		LA County (nm)		Ventura Co. hours/trip		LA Co. hours/trip		
Platform	**Grace**	**Gail**	**Grace**	**Gail**	**Grace**	**Gail**	**Grace**	**Gail**	**Grace**	**Gail**	**Vessel**
Long Beach (inbound)	94	88	34	28	60	60	3.4	2.8	6.0	6.0	Adele Elise
Long Beach (outbound)	89	83	32	26	57	57	3.2	2.6	5.7	5.7	Adele Elise
Port Hueneme (inbound)	25	19	25	19	0	0	2.5	1.9	0.0	0.0	Adele Elise
Port Hueneme (outbound)	20	14	20	14	0	0	2.0	1.4	0.0	0.0	Adele Elise

Notes: Adele Elise cruises at 10 knots

Platform Conductor Removal Program
Emissions Summary

Disposal Option	Ventura County					LA County				
	NOx	ROG	PM10	SOx	CO	NOx	ROG	PM10	SOx	CO
Port of Long Beach										
Grace: Peak Day Pounds	265.11	43.18	27.31	0.33	151.92	359.24	45.33	43.62	0.21	158.24
Gail: Peak Day Pounds	246.51	43.78	23.91	0.40	147.74	359.24	45.33	43.62	0.21	158.24
TOTALS	**511.62**	**86.96**	**51.22**	**0.74**	**299.66**	**718.48**	**90.67**	**87.24**	**0.43**	**316.47**
Grace: Total Tons (2021)	5.11	0.93	0.46	0.01	3.58	5.75	0.73	0.70	0.00	2.53
Gail: Total Tons (2023)	8.94	1.66	0.78	0.01	6.53	11.50	1.45	1.40	0.01	5.06
TOTALS	**14.05**	**2.58**	**1.25**	**0.02**	**10.11**	**17.24**	**2.18**	**2.09**	**0.01**	**7.60**
Saticoy										
Grace: Peak Day Pounds	206.56	35.64	20.03	0.30	125.61					
Gail: Peak Day Pounds	189.86	36.55	16.95	0.38	122.53					
TOTALS	**396.43**	**72.19**	**36.98**	**0.68**	**248.14**					
Grace: Total Tons (2021)	4.16	0.80	0.35	0.01	3.16					
Gail: Total Tons (2023)	7.11	1.43	0.56	0.01	5.72					

Platform Grace Conductor Removal Program: POLB Disposal
Greenhouse Gas Emissions

OFF-ROAD SOURCES

						Emission Factors: g/BHP-hr [2]			Peak Day Pounds				English Tons		
Source	Fuel	BHP	Number	Load Factor[1]	Peak Day Hours	CO2	CH4	N2O	CO2	CH4	N2O	Total Days	CO2	CH4	N2O
Jacking and Pulling Unit															
Cummins QSK 19-Tier 4	Diesel	760	1	50	8	554.7	0.0225	0.0045	3717.57	0.15	0.03	90	167.29	0.007	0.001
Air compressor-Tier 4	Diesel	300	1	48	8	554.7	0.0225	0.0045	1408.76	0.06	0.01	90	63.39	0.003	0.001
Abrasive Water Jet															
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	7	554.7	0.0225	0.0045	2058.72	0.08	0.02	28	28.82	0.001	0.000
Hydraulic power unit-Kubota D1305-E3B (Tier 4)	Diesel	29	1	48	7	554.7	0.0225	0.0045	119.16	0.00	0.00	28	1.67	0.000	0.000
Air compressor-Tier 3	Diesel	500	1	48	7	554.7	0.0225	0.0045	2054.44	0.08	0.02	28	28.76	0.001	0.000
Drill Pin Sever															
Hydraulic power unit (Tier 3)	Diesel	200	1	48	12	554.7	0.0225	0.0045	1408.76	0.06	0.01	90	63.39	0.003	0.001
Marine Growth Removal															
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	8	554.7	0.0225	0.0045	2352.83	0.10	0.02	90	105.88	0.004	0.001
Transportation & Disposal															
Adele Elise mains-Caterpillar 3516 (Tier 2): Ventura Co.	Diesel	2000	2	65	3.3	554.7	0.0225	0.0045	10492.34	0.43	0.09	32	167.88	0.007	0.001
Adele Elise bowthruster-Cummins QSK 19M (Tier 2): Ventura Co.	Diesel	660	1	50	0.5	554.7	0.0225	0.0045	201.78	0.01	0.00	32	3.23	0.000	0.000
Adele Elise generators-Cummins QSK19M (Tier 2): Ventura Co.	Diesel	660	2	50	3.3	554.7	0.0225	0.0045	2663.44	0.11	0.02	32	42.62	0.002	0.000
Adele Elise mains-Caterpillar 3516 (Tier 2): LA Co.	Diesel	2000	2	65	5.9	554.7	0.0225	0.0045	18759.03	0.76	0.15	32	300.14	0.012	0.002
Adele Elise bowthruster-Cummins QSK 19M (Tier 2): LA Co.	Diesel	660	1	50	0.5	554.7	0.0225	0.0045	201.78	0.01	0.00	32	3.23	0.000	0.000
Adele Elise generators-Cummins QSK19M (Tier 2): LA Co.	Diesel	660	2	50	5.9	554.7	0.0225	0.0045	4761.91	0.19	0.04	32	76.19	0.003	0.001
Platform crane-GM 8V92[5]: Ventura Co.	Diesel	300	1	29	8	554.7	0.0225	0.0045	851.13	0.03	0.01	5.8	2.47	0.000	0.000
												Totals	**1055.0**	**0.043**	**0.009**

ON-ROAD SOURCES

			Emission Factors, Input [3]							Metric Tons			
			CO2	CH4	N2O	CO2	CH4	N2O					
On Road Sources	Miles/Round Trip	Round Trips/Day	g/mile	g/mile	g/mile	Peak lb/day	Peak lb/day	Peak lb/day	Days[4]	CO2	CH4	N2O	CO2E
Flatbed Truck (T6 instate contruction heavy)	0	0	951.8	0.0062	0.15	0	0.0000	0.0000	0	0.00	0.0000	0.0000	0.000
									Ventura Co. Totals=>	**612.7**	**0.025**	**0.005**	**614.7**
									LA Co. Totals=>	**344.3**	**0.014**	**0.003**	**345.5**

Notes:

[1] Load Factors (except vessels) derived from CalEEMod, 2016 Appendix D - Default Data Tables, Table 3.3 OFFROAD Default Horsepower and Load Factors

[2] Emission factors from BOEM Air Emissions Associated with Decommissioning Operations for Pacific Outer Continental Shelf Oil and Gas Platforms; Table B-3

[3] Truck emissions factors from EMFAC 2017, Ventura County, year 2021

[4] Based on total trips/peak day trips

[5] Crane hours based on 8 hour peak day and 46 total hours (5.8 days)

Adele Elise peak day hours based on one 9.2 hour trip to Long Beach, total days based on 32 one-way trips

Platform Grace Conductor Removal Program: Saticoy Disposal
Greenhouse Gas Emissions

OFF-ROAD SOURCES

Source	Fuel	BHP	Number	Load Factor[1]	Peak Day Hours	Emission Factors: g/BHP-hr [2]			Peak Day Pounds			Total Days	English Tons		
						CO2	CH4	N2O	CO2	CH4	N2O		CO2	CH4	N2O
Jacking and Pulling Unit															
Cummins QSK 19-Tier 4	Diesel	760	1	50	8	554.7	0.0225	0.0045	3717.57	0.15	0.03	90	167.29	0.007	0.001
Air compressor-Tier 4	Diesel	300	1	48	8	554.7	0.0225	0.0045	1408.76	0.06	0.01	90	63.39	0.003	0.001
Abrasive Water Jet															
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	7	554.7	0.0225	0.0045	2058.72	0.08	0.02	28	28.82	0.001	0.000
Hydraulic power unit-Kubota D1305-E3B (Tier 4)	Diesel	29	1	48	7	554.7	0.0225	0.0045	119.16	0.00	0.00	28	1.67	0.000	0.000
Air compressor-Tier 3	Diesel	500	1	48	7	554.7	0.0225	0.0045	2054.44	0.08	0.02	28	28.76	0.001	0.000
Drill Pin Sever															
Hydraulic power unit (Tier 3)	Diesel	200	1	48	12	554.7	0.0225	0.0045	1408.76	0.06	0.01	90	63.39	0.003	0.001
Marine Growth Removal															
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	8	554.7	0.0225	0.0045	2352.83	0.10	0.02	90	105.88	0.004	0.001
Transportation & Disposal															
Adele Elise mains-Caterpillar 3516 (Tier 2): Ventura Co.	Diesel	2000	2	65	2.25	554.7	0.0225	0.0045	7153.87	0.29	0.06	32	114.46	0.005	0.001
Adele Elise bowthruster-Cummins QSK 19M (Tier 2): Ventura Co.	Diesel	660	1	50	1	554.7	0.0225	0.0045	403.55	0.02	0.00	32	6.46	0.000	0.000
Adele Elise generators-Cummins QSK19M (Tier 2): Ventura Co.	Diesel	660	2	50	2.25	554.7	0.0225	0.0045	1815.98	0.07	0.01	32	29.06	0.001	0.000
Adele Elise mains-Caterpillar 3516 (Tier 2): LA Co.	Diesel	2000	2	65	0	554.7	0.0225	0.0045	0.00	0.00	0.00	0	0.00	0.000	0.000
Adele Elise bowthruster-Cummins QSK 19M (Tier 2): LA Co.	Diesel	660	1	50	0	554.7	0.0225	0.0045	0.00	0.00	0.00	0	0.00	0.000	0.000
Adele Elise generators-Cummins QSK19M (Tier 2): LA Co.	Diesel	660	2	50	0	554.7	0.0225	0.0045	0.00	0.00	0.00	0	0.00	0.000	0.000
Platform crane-GM 8V92[5]: Ventura Co.	Diesel	300	1	29	8	554.7	0.0225	0.0045	851.13	0.03	0.01	5.8	2.47	0.000	0.000
												Totals	**611.7**	**0.025**	**0.005**

ON-ROAD SOURCES

On Road Sources	Miles/Round Trip	Round Trips/Day	Emission Factors, Input [3]						Days[4]	Metric Tons			
			CO2 g/mile	CH4 g/mile	N2O g/mile	CO2 Peak lb/day	CH4 Peak lb/day	N2O Peak lb/day		CO2	CH4	N2O	CO2E
Flatbed Truck (T6 instate contruction heavy)	25	10	951.8	0.0062	0.15	524.58	0.0034	0.0827	12.5	2.97	0.0000	0.0005	3.099
									Ventura Co. Totals=>	**557.9**	**0.023**	**0.005**	**559.8**
									LA Co. Totals=>	**0.00**	**0.00**	**0.00**	**0.0**

Notes:

[1] Load Factors (except vessels) derived from CalEEMod, 2016 Appendix D - Default Data Tables, Table 3.3 OFFROAD Default Horsepower and Load Factors

[2] Emission factors from BOEM Air Emissions Associated with Decommissioning Operations for Pacific Outer Continental Shelf Oil and Gas Platforms; Table B-3

[3] Truck emissions factors from EMFAC 2017, Ventura County, year 2021

[4] Based on total trips/peak day trips

[5] Crane hours based on 8 hour peak day and 46 total hours (5.8 days)

Adele Elise peak day hours based on one 2.25 hour trip to Port Hueneme, total days based on 32 one-way trips

Platform Gail Conductor Removal Program: POLB Disposal
Greenhouse Gas Emissions

OFF-ROAD SOURCES

Source	Fuel	BHP	Number	Load Factor[1]	Peak Day Hours	Emission Factors: g/BHP-hr [2]			Peak Day Pounds			Total Days	English Tons		
						CO2	CH4	N2O	CO2	CH4	N2O		CO2	CH4	N2O
Jacking and Pulling Unit															
Cummins QSK 19-Tier 4	Diesel	760	1	50	8	554.7	0.0225	0.0045	3717.57	0.15	0.03	180	334.58	0.014	0.003
CMT Pump (Tier 3)	Diesel	300	1	74	24	554.7	0.0225	0.0045	6515.52	0.26	0.05	28	91.22	0.004	0.001
Air compressor-Tier 4	Diesel	300	1	48	8	554.7	0.0225	0.0045	1408.76	0.06	0.01	180	126.79	0.005	0.001
Abrasive Water Jet															
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	0	554.7	0.0225	0.0045	0.00	0.00	0.00	0	0.00	0.000	0.000
Hydraulic power unit-Kubota D1305-E3B (Tier 4)	Diesel	29	1	48	0	554.7	0.0225	0.0045	0.00	0.00	0.00	0	0.00	0.000	0.000
Air compressor-Tier 3	Diesel	500	1	48	0	554.7	0.0225	0.0045	0.00	0.00	0.00	0	0.00	0.000	0.000
Drill Pin Sever															
Hydraulic power unit (Tier 3)	Diesel	200	1	48	12	554.7	0.0225	0.0045	1408.76	0.06	0.01	180	126.79	0.005	0.001
Marine Growth Removal															
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	8	554.7	0.0225	0.0045	2352.83	0.10	0.02	180	211.75	0.009	0.002
Transportation & Disposal															
Adele Elise mains-Caterpillar 3516 (Tier 2): Ventura Co.	Diesel	2000	2	65	2.7	554.7	0.0225	0.0045	8584.64	0.35	0.07	64	274.71	0.011	0.002
Adele Elise bowthruster-Cummins QSK 19M (Tier 2): Ventura Co.	Diesel	660	1	50	0.5	554.7	0.0225	0.0045	201.78	0.01	0.00	64	6.46	0.000	0.000
Adele Elise generators-Cummins QSK19M (Tier 2): Ventura Co.	Diesel	660	2	50	2.7	554.7	0.0225	0.0045	2179.18	0.09	0.02	64	69.73	0.003	0.001
Adele Elise mains-Caterpillar 3516 (Tier 2): LA Co.	Diesel	2000	2	65	5.9	554.7	0.0225	0.0045	18759.03	0.76	0.15	64	600.29	0.024	0.005
Adele Elise bowthruster-Cummins QSK 19M (Tier 2): LA Co.	Diesel	660	1	50	0.5	554.7	0.0225	0.0045	201.78	0.01	0.00	64	6.46	0.000	0.000
Adele Elise generators-Cummins QSK19M (Tier 2): LA Co.	Diesel	660	2	50	5.9	554.7	0.0225	0.0045	4761.91	0.19	0.04	64	152.38	0.006	0.001
Platform crane:Caterpillar[5]: Ventura Co.	Diesel	545	1	29	8	554.7	0.0225	0.0045	1546.21	0.06	0.01	9.4	7.27	0.000	0.000
												Totals	**2008.4**	**0.081**	**0.016**

ON-ROAD SOURCES

On Road Sources	Miles/Round Trip	Round Trips/Day	Emission Factors, Input [3]							Metric Tons			
			CO2	CH4	N2O	CO2	CH4	N2O					
			g/mile	g/mile	g/mile	Peak lb/day	Peak lb/day	Peak lb/day	Days[4]	CO2	CH4	N2O	CO2E
Flatbed Truck (T6 instate contruction heavy)	0	0	842.0	0.00044	0.132	0	0.0000	0.0000	0	0.00	0.0000	0.0000	0.000
									Ventura Co. Totals=>	**1133.4**	**0.046**	**0.009**	**1137.1**
									LA Co. Totals=>	**688.7**	**0.028**	**0.006**	**690.9**

Notes:

[1] Load Factors (except vessels) derived from CalEEMod, 2016 Appendix D - Default Data Tables, Table 3.3 OFFROAD Default Horsepower and Load Factors

[2] Emission factors from BOEM Air Emissions Associated with Decommissioning Operations for Pacific Outer Continental Shelf Oil and Gas Platforms; Table B-3

[3] Truck emissions factors from EMFAC 2017, Ventura County, year 2021

[4] Based on total trips/peak day trips

[5] Crane hours based on 8 hour peak day and 75 total hours (9.4 days)

Adele Elise peak day hours based on one 8.6 hour trip to Long Beach, total days based on 64 one-way trips

Platform Gail Conductor Removal Program: Saticoy Disposal
Greenhouse Gas Emissions

OFF-ROAD SOURCES

Source	Fuel	BHP	Number	Load Factor[1]	Peak Day Hours	Emission Factors: g/BHP-hr [2]			Peak Day Pounds			Total Days	English Tons		
						CO2	CH4	N2O	CO2	CH4	N2O		CO2	CH4	N2O
Jacking and Pulling Unit															
Cummins QSK 19-Tier 4	Diesel	760	1	50	8	554.7	0.0225	0.0045	3717.57	0.15	0.03	180	334.58	0.014	0.003
CMT Pump (Tier 3)	Diesel	300	1	74	24	554.7	0.0225	0.0045	6515.52	0.26	0.05	28	91.22	0.004	0.001
Air compressor-Tier 4	Diesel	300	1	48	8	554.7	0.0225	0.0045	1408.76	0.06	0.01	180	126.79	0.005	0.001
Abrasive Water Jet															
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	7	554.7	0.0225	0.0045	2058.72	0.08	0.02	0	0.00	0.000	0.000
Hydraulic power unit-Kubota D1305-E3B (Tier 4)	Diesel	29	1	48	7	554.7	0.0225	0.0045	119.16	0.00	0.00	0	0.00	0.000	0.000
Air compressor-Tier 3	Diesel	500	1	48	7	554.7	0.0225	0.0045	2054.44	0.08	0.02	0	0.00	0.000	0.000
Drill Pin Sever															
Hydraulic power unit (Tier 3)	Diesel	200	1	48	12	554.7	0.0225	0.0045	1408.76	0.06	0.01	180	126.79	0.005	0.001
Marine Growth Removal															
Water pump-John Deere D6090HF485 (Tier 3)	Diesel	325	1	74	8	554.7	0.0225	0.0045	2352.83	0.10	0.02	180	211.75	0.009	0.002
Transportation & Disposal															
Adele Elise mains-Caterpillar 3516 (Tier 2): Ventura Co.	Diesel	2000	2	65	1.7	554.7	0.0225	0.0045	5405.15	0.22	0.04	64	172.96	0.007	0.001
Adele Elise bowthruster-Cummins QSK 19M (Tier 2): Ventura Co.	Diesel	660	1	50	1	554.7	0.0225	0.0045	403.55	0.02	0.00	64	12.91	0.001	0.000
Adele Elise generators-Cummins QSK19M (Tier 2): Ventura Co.	Diesel	660	2	50	1.7	554.7	0.0225	0.0045	1372.08	0.06	0.01	64	43.91	0.002	0.000
Adele Elise mains-Caterpillar 3516 (Tier 2): LA Co.	Diesel	2000	2	65	0	554.7	0.0225	0.0045	0.00	0.00	0.00	0	0.00	0.000	0.000
Adele Elise bowthruster-Cummins QSK 19M (Tier 2): LA Co.	Diesel	660	1	50	0	554.7	0.0225	0.0045	0.00	0.00	0.00	0	0.00	0.000	0.000
Adele Elise generators-Cummins QSK19M (Tier 2): LA Co.	Diesel	660	2	50	0	554.7	0.0225	0.0045	0.00	0.00	0.00	0	0.00	0.000	0.000
Platform crane:Caterpillar[5]: Ventura Co.	Diesel	545	1	29	8	554.7	0.0225	0.0045	1546.21	0.06	0.01	9.4	7.27	0.000	0.000
												Totals	**1128.2**	**0.046**	**0.009**

ON-ROAD SOURCES

On Road Sources	Miles/Round Trip	Round Trips/Day	Emission Factors, Input [3]							Metric Tons			
			CO2	CH4	N2O	CO2	CH4	N2O					
			g/mile	g/mile	g/mile	Peak lb/day	Peak lb/day	Peak lb/day	Days[4]	CO2	CH4	N2O	CO2E
Flatbed Truck (T6 instate contruction heavy)	25	10	842	0.00044	0.132	464.07	0.0002	0.0728	25.0	5.26	0.0000	0.0008	5.481
									Ventura Co. Totals=>	**1028.7**	**0.042**	**0.009**	**1032.3**
									LA Co. Totals=>	**0.0**	**0.0**	**0.0**	**0.0**

Notes:

[1] Load Factors (except vessels) derived from CalEEMod, 2016 Appendix D - Default Data Tables, Table 3.3 OFFROAD Default Horsepower and Load Factors

[2] Emission factors from BOEM Air Emissions Associated with Decommissioning Operations for Pacific Outer Continental Shelf Oil and Gas Platforms; Table B-3

[3] Truck emissions factors from EMFAC 2017, Ventura County, year 2021

[4] Based on total trips/peak day trips

[5] Crane hours based on 8 hour peak day and 75 total hours (9.4 days)

Adele Elise peak day hours based on one 1.7 hour trip to Port Hueneme, total days based on 64 one-way trips

Distance (using shipping lanes, nm)			Ventura County (nm)		LA County (nm)		Ventura Co. hours/trip		LA Co. hours/trip		
Platform	**Grace**	**Gail**	**Grace**	**Gail**	**Grace**	**Gail**	**Grace**	**Gail**	**Grace**	**Gail**	**Vessel**
Long Beach (inbound)	94	88	34	28	60	60	3.4	2.8	6.0	6.0	Adele Elise
Long Beach (outbound)	89	83	32	26	57	57	3.2	2.6	5.7	5.7	Adele Elise
Port Hueneme (inbound)	25	19	25	19	0	0	2.5	1.9	0.0	0.0	Adele Elise
Port Hueneme (outbound)	20	14	20	14	0	0	2.0	1.4	0.0	0.0	Adele Elise

Notes: Adele Elise cruises at 10 knots

Platform Conductor Removal Program
GHG Emissions Summary

Disposal Option	Ventura County				LA County			
	CO2	CH4	N2O	CO2E	CO2	CH4	N2O	CO2E
Port of Long Beach								
Grace: Total Metric Tons (2021)	612.72	0.02	0.00	614.73	344.34	0.01	0.00	345.47
Gail: Total Metric Tons (2023)	1133.35	0.05	0.01	1137.08	688.68	0.03	0.01	690.94
TOTAL	**1746.07**	**0.07**	**0.01**	**1751.81**	**1033.01**	**0.04**	**0.01**	**1036.41**
Saticoy								
Grace: Total Metric Tons (2021)	557.86	0.02	0.00	559.81				
Gail: Total Metric Tons (2023)	1028.74	0.04	0.01	1032.32				

APPENDIX D

Biological Assessment

BIOLOGICAL ASSESSMENT

SANTA CLARA UNIT (PLATFORMS GRACE AND GAIL) CONDUCTOR CUTTING PROGRAM, OFFSHORE VENTURA COUNTY, CALIFORNIA

Project No. 2002-5111

Prepared for:

Chevron West Coast Decommissioning Program
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SEPTEMBER 2020

padre associates, inc.
ENGINEERS, GEOLOGISTS & ENVIRONMENTAL SCIENTISTS

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1.0 EXECUTIVE SUMMARY

The purpose of the Biological Assessment (BA) is to review the proposed Santa Clara Unit (Platforms Gail and Grace) Conductor Cutting Program (Project) in sufficient detail to determine to what extent the proposed action may affect any federally threatened, endangered or proposed species described in this document. This BA is prepared in accordance with legal requirements set forth under Section 7 of the Federal Endangered Species Act (FESA, 16 U.S.C. 1536(c)), and follows the standard established by the National Environmental Policy Act (NEPA) and FESA guidance.

The species considered in this document were based on information obtained from species list provided by National Marine Fisheries Service (NMFS), and the recorded U.S. Fish and Wildlife Service (USFWS) protected species within the Project area. The listed and proposed species are detailed in Table 3.0-1. Critical habitat has been designated for six of the 17 listed species included in this BA; however, there are no critical habitats within the Project area. Minimization and avoidance measures included in Section 5.0 (Applicant Proposed Mitigation Measures) will be initiated to ensure minimal impacts on marine species.

2.0 PROJECT DESCRIPTION

The following Biological Assessment (BA) has been prepared by Padre Associates, Inc. (Padre) on behalf of Chevron West Coast Decommissioning (Chevron WCD) for the Santa Clara Unit (Platforms Grace and Gail) Conductor Cutting Program (Project).

This BA was prepared per guidance within Section 7 of the Federal Endangered Species Act (FESA). Section 7 of the FESA requires that Federal agencies must consult with the United States Fish and Wildlife Service (USFWS) and/or the National Marine Fisheries Service (NMFS) that provide protection of Federally listed species and Federally designated Critical Habitats. The initial step in the consultation process is to acquire an official list of Federally Threatened and Endangered species that may occur in the proposed Project area, and/or may be affected by the proposed Project. A BA is required to be submitted prior to initiation of a consultation between Federal agencies when a listed species or Critical Habitat is present within the proposed action area where potentially impactful activities are proposed.

This BA provides information on the potential effects of the Project on Federally listed species and Federally designated Critical Habitat. Federally listed species discussed in this BA include species listed within the official species list provided by the NMFS on June 17, 2020 (NMFS, 2020) (Appendix A), information on listed species documented within the vicinity of the Project site based on a desktop review of Federal, State, and local resources/databases, and results of biological surveys conducted within the Project site.

2.1 PROPOSED ACTION

Chevron WCD proposes to remove the conductors at both Platforms Grace and Gail in accordance with BSEE requirements. The SCU facilities are located within Federal Outer Continental Shelf (OCS) waters and include Platforms Grace (OCS P-217) and Gail (OCS P-0205) (Figure 2.1-1). The Project proposes to cut the conductors 15 feet (ft) (4.5 meters [m]) below the seafloor and recover each conductor to the deck of the Platform. Prior to removal operations, the conductors will be cleaned of marine growth using divers with water jetting tools. In addition to diver operations, a water jetting ring will be attached to each conductor below the water line prior to jacking operations to continue removal of any attached marine growth on the lower sections of the conductor.

Abrasive material or mechanical cutting methods will be utilized to make the cuts from inside the conductor and through the outer casing(s). The abrasive material will be made up of Sharpshot© Iron Silicate Abrasives. The average initial conductor cut requires approximately 7 hours, or approximately 3,500 lbs. of material for abrasive material cutting methodology and twelve to twenty-four hours for the mechanical cutting methodology. Conductors will be recovered in multiple sections.

The cut conductor pipe will be pulled up to the Platform deck using a casing jack or hydraulic hoist and then placed onto the Platform staging area(s) to be cut into smaller segments utilizing a mechanical cutting tool. Topside cuts will require approximately 3 hours each once the conductors have been lifted from the seafloor.

The cut pipe will be stacked on the Platform deck and then transferred to the OSV *Adele Elise* or similar vessel for transport to SA Recycling in the Port of Long Beach (POLB) or brought

to Port Hueneme for trucking to Standard Industries in Saticoy, Ventura County, California. Once all well conductors on Platform Grace are completed in 2021, the Platform equipment and support vessels will be demobilized and will return to complete well conductor removal activities on Platform Gail in 2023.

2.2 PROJECT SCHEDULE

The proposed activities, including mobilization and demobilization, are expected to take approximately 360 operational days to complete. Work at Platform Grace would take approximately 120 days (4 months), and removal at Platform Gail would take approximately 240 days (8 months). The conductor cutting and removal is targeted for at Platform Grace in the 3rd quarter of 2021, following completion of well Temporary Abandonment (TA) prior to final removal (anticipated to be completed by the 1st quarter of 2021) and all required environmental reviews and permitting. Conductor cutting and removal is targeted at Platform Gail in the 2nd through 3rd quarter of 2023, following completion of well TA and all required environmental reviews and permitting.

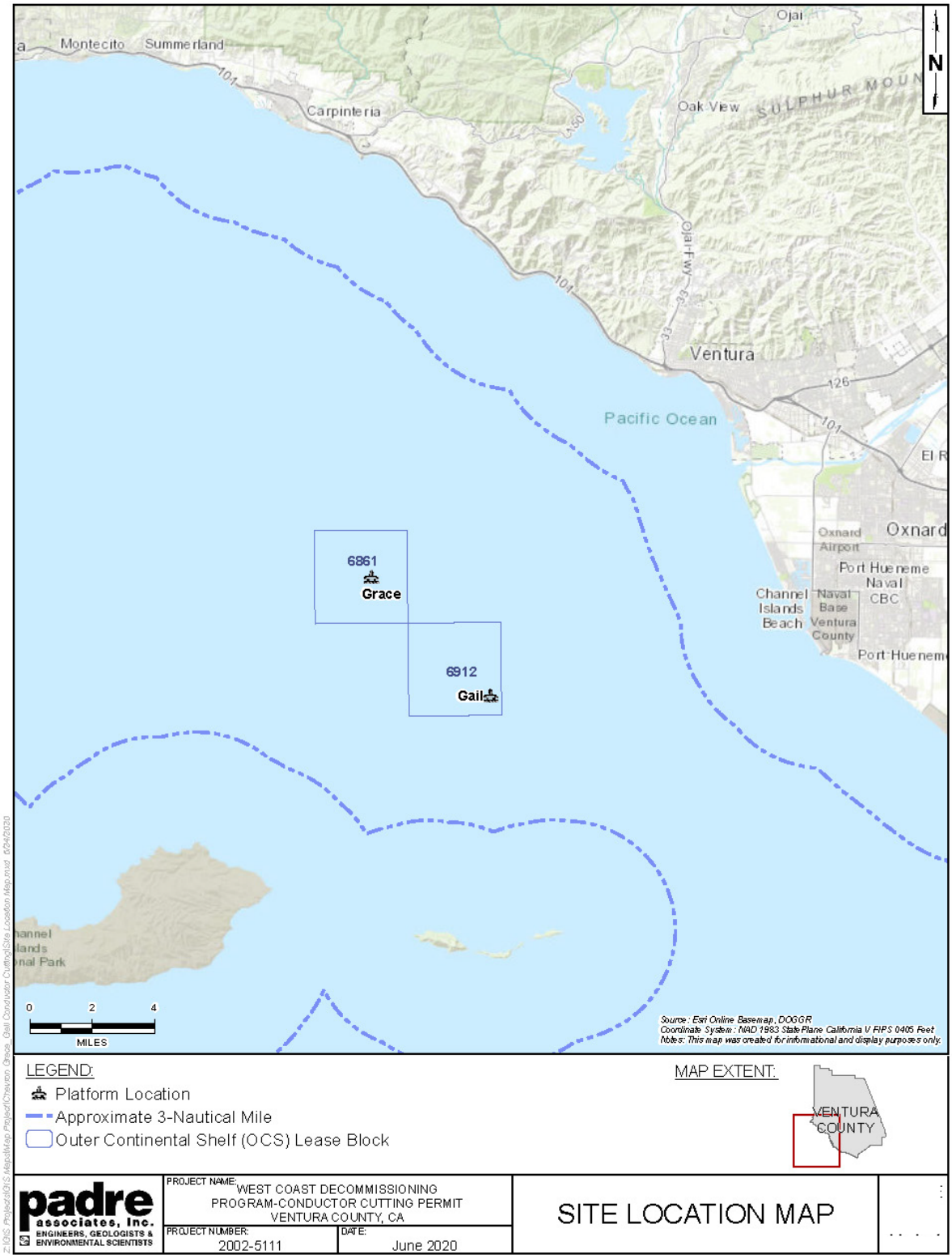

Figure 2.1-1 Project Location

3.0 SPECIES ACCOUNTS AND STATUS OF THE SPECIES IN THE ACTION AREA

Based on the species lists provided on the USFWS and NMFS websites and the known presence of threatened or endangered species in the area, an analysis of the range and habitat preferences of those species was conducted (USFWS, 2020; and NMFS, 2020) (Appendix C – NMFS Official Species List Correspondence; no threatened or endangered species list was generated when USFWS Information Planning and Consultation system [IPaC] was queried). Due to the over-water limits of the Project location and lack of terrestrial disturbance, the species descriptions in this section are confined to those listed species that have a potential to occur in the offshore Project area.

Table 3.0-1. Special Status and Protected Species Within or Near the Project Area and Their Likelihood of Occurrence within the Project Area

Common Name	Scientific Name	Status[1]	Likelihood to occur
INVERTEBRATES			
White abalone	*Haliotis sorenseni*	FE	Unlikely to Occur
Black abalone	*Haliotis cracherodii*	FE	Unlikely to Occur
TURTLES			
Olive Ridley turtle	*Lepidochelys olivacea*	FT	Unlikely to Occur
Green turtle	*Chelonia mydas*	FT	Possible
Loggerhead turtle	*Caretta caretta*	FT	Possible
Leatherback turtle	*Dermochelys coriacea*	FE	Possible
BIRDS			
California least tern	*Sternula antillarum*	M, FP, FE, SE	Unlikely to Occur
Marbled murrelet	*Brachyramphus marmoratus*	M, FT, SE	Unlikely to Occur
Short-tailed albatross	*Phoebastria albatrus*	M, FE	Unlikely to Occur
MAMMALS			
Cetaceans			
Blue whale	*Balaenoptera musculus*	FE	Possible
Fin whale	*Balaenoptera physalus*	FE	Possible
Humpback whale	*Megaptera novaeangliae*	FE	Possible
Northern right whale	*Eubalaena glacialis*	FE	Unlikely to Occur
Sei whale	*Balaenoptera borealis*	FE	Unlikely to Occur
Sperm whale	*Physeter macrocephalus*	FE	Possible

Table 3.0-1. Special Status and Protected Species Within or Near the Project Area and Their Likelihood of Occurrence within the Project Area

Common Name	Scientific Name	Status[1]	Likelihood to occur
Killer whale	*Orcinus orca*	FE (Southern Resident Stock)	Unlikely to Occur
Pinnipeds			
Guadalupe fur seal	*Arctocephalus townsendi*	FT, ST	Possible

Status[1]

M = Protected under the federal Migratory Bird Treaty Act (MBTA)

FE = federally endangered SE = California State endangered FC= Federal Candidate for Listing

FT = federally threatened ST = California State threatened BCC = USFWS Bird of Conservation Concern

3.1 INVERTEBRATES

3.1.1 White Abalone (*Haliotis sorenseni*)

3.1.1.1 Status

Following the closure of the fishery for this species in 1996, the white abalone was listed as endangered in 2001. Critical habitat has not been designated (NMFS, 2018).

3.1.1.2 Range and Habitat

NMFS (2008) states that the 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) and deep as 200 ft (60 m) making them the deepest occurring abalone species in California. White abalone are 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). The historic range of white abalone extended from Point Conception, California to Punta Abreojos, Baja California. In the northern part of the California range, white abalone were reported as being more common along the mainland coast. In the middle portion of the California range, they were noted to occur more frequently at the offshore islands (especially San Clemente and Santa Catalina islands). At the southern end of the range in Baja California, white abalone were reported to occur more commonly along the mainland coast but were also found at a number of islands including Isla Cedros and Isla Natividad (NMFS, 2008).

3.1.1.3 Natural History

Because the white abalone broadcast spawns, relatively dense aggregations of adults are necessary for successful egg fertilization. Spawning in white abalone occurs in winter months, but sometimes extends into the spring. Eggs hatch within one day of fertilization, and after one or two weeks the free-swimming, larvae settle to the seafloor. White abalone grow to approximately 20 to 25 cm (5 to 8 in) in diameter (NMFS, 2008). Like all abalone, white abalone

are herbivorous with the young feeding on diatoms and filamentous algae on the surface of the rock substrate. Adults depend on drift algae, especially deteriorating kelp. *Laminaria* spp. and *Macrocystis* spp. (brown algae) are believed to make up a large portion of the diet.

3.1.1.4 Population Trends

From 2002 to 2014, the abundance of white abalone is estimated to have declined by 76 percent. Population estimates contain a high degree of error, but the total estimated number of white abalone declined from 15,323 (±5,362) in 2002 to 3,375 (±1,396) in 2010 (NMFS, 2018).

3.1.2 Black Abalone (*Haliotis cracherodii*)

3.1.2.1 Status

The black abalone was listed as a federally endangered species in January 2009 and critical habitat was designated in November 2011 (NMFS, 2019). The closest segment of critical habitat for black abalone is the intertidal and subtidal habitats around Anacapa Island, approximately seven miles south of Platform Gail.

3.1.2.2 Range and Habitat

The black abalone is found in rocky intertidal and subtidal marine habitats from Point Arena to Bahia Tortugas, Mexico and it is rare north San Francisco, California. Black abalone generally inhabit coastal and offshore island intertidal habitats on exposed rocky shores where bedrock provides deep, protective crevices for shelter. Black abalone range vertically from the high intertidal zone to approximately 18-ft (6-m) water depth (NMFS, 2019).

3.1.2.3 Natural History

Adult black abalone prefer to feed on algae, both giant kelp (*Macrocystis sp.*) and feather-boa kelp (*Egregia menzisii*). It is believed that crustose coralline algae are an important component of juvenile settlement habitat, whereas drift macroalgae are important food resources for post-metamorphic juvenile and adult abalones (NMFS, 2019). Black abalone reach sexual maturity at a small size and fertilization is external within the water column. A one-inch abalone can spawn 10,000 eggs or more at a one time, while an eight-inch abalone spawn 11 million eggs. Fertilized eggs hatch into floating larvae that feed on plankton until their shells begin to form. When large enough, juvenile abalone will settle to the bottom, and they will further develop on rocky substrate when the habitat is suitable (Center for Biological Diversity, 2020).

3.1.2.4 Population Trends

The black abalone population along the California coast south of Monterey County, has been estimated to have declined as much as 95 percent (Argonne National Laboratory, 2019). Historical and ongoing threats include overfishing, habitat destruction, and more recently the disease of withering syndrome. Black abalone populations stabilized between 2011 to 2015; however, new abalone recruitment appears to be minimal in region (Argonne National Laboratory, 2019).

3.2 MARINE BIRDS

3.2.1 California Least Tern (*Sternula antillarum*)

3.2.1.1 Status

The California least tern was listed as a federally endangered species in 1970 (Frost, 2016). No critical habitat has been designated.

3.2.1.2 Range and Habitat

California least terns live along the coast from San Francisco to northern Baja California and migrate from the southern portion of their range to the north. Least terns begin arriving in southern California as early as March and depart following the fledging of the young in September or October (Frost, 2017). In Ventura County there are four breeding colonies of least terns: Ormond Beach, Hollywood Beach, Santa Clara River/McGrath State Beach and Point Mugu, which has the most recorded nesting pairs and successful fledglings in the County (Frost, 2017).

3.2.1.3 Natural History

This species nest in colonies and utilize the upper portions of open beaches or inshore flat sandy areas that are free of vegetation. The typical colony size is 25 pairs. Most least terns begin breeding in their third year, and mating begins in April or May. The nest consists of a simple scrape in the sand or shell fragments and typically there are two eggs in a clutch. Egg incubation and care for the young are accomplished by both parents. Least terns can re-nest up to two times if eggs or chicks are lost early in the breeding season. California least terns forage for small epipelagic fish (anchovy, atherinids, and shiner surfperch) primarily in near shore ocean waters and in shallow estuaries. Least terns dive to capture small fish and require clear water to locate their prey that is found in the upper water column in the nearshore ocean waters (Frost, 2017; USFWS, 2006).

3.2.1.4 Population Trends

The species' population has increased from 600 in 1973 to roughly 7,100 pairs in 2005. The number of California least tern sites has nearly doubled since the time of listing (USFWS, 2006).

3.2.2 Marbled murrelet (*Brachyramphus marmoratus*)

3.2.2.1 Status

The marbled murrelet was listed as a federally threatened species in 1992. It is also a California state-listed endangered species. Critical habitat was designated in 1996 North of Monterey, but none in the Project area (USFWS, 1997).

3.2.2.2 Range and Habitat

Historically, the marbled murrelet was common from Monterey, California to southern Oregon. This small sea bird spends most of its life in the nearshore marine environment, but nests and roosts inland in low-elevation old growth forests, or other forests with remnant large trees. Nesting generally occurs in the marine fog belt within 25 mi (40.2 km) of the coast in coast redwood, Douglas fir, western red cedar, western hemlock, and Sitka spruce. The species nests from Washington to central California (Monterey Bay area). This bird is rare in southern California

and is only found in the non-breeding season (late fall, winter, and early spring) in Ventura County (USFWS, 1997).

3.2.2.3 Natural History

Marbled murrelets nest in old-growth forests, approximately 50 miles (80 kilometers) inland, characterized by large trees, a multistoried stand, and moderate to high canopy closure. Nesting season for this species is late March to late September; downy young, and fledged juveniles have been observed June to September. Activity in forest nesting areas is highest from mid-April through late July in California and Oregon. Clutch size is one and incubation lasts about 30 days. Murrrelet's primarily feed in nearshore marine waters and their diet includes fishes (sandlance, capelin, herring, etc.), crustaceans (mysids, euphausiids), mollusks (USFWS, 1997).

3.2.2.4 Population Trends

Monitoring surveys conducted between 2000 and 2013 estimated 19,700 birds are present in the Northwest Forest Planning Area. Studies recorded linear declines in murrelet populations in the Washington nesting areas but found no evidence of declining populations in Oregon or California conservation areas (Falxa et al., 2016).

3.2.3 Short-tailed Albatross (*Diomedea albatrus*)

3.2.3.1 Status

The Short-tailed albatross was listed as a federally endangered species in 2000 (USFWS, 2008). No critical habitat has been designated.

3.2.3.2 Range and Habitat

As of 2008, 80 to 85 percent of the known breeding short-tailed albatross use a single colony, Tsubamezaki, on Torishima Island in Japan. The remaining population nests on other islands surrounding Japan. During the non-breeding season (July through October), short-tailed albatross range along the Pacific Rim from southern Japan to northern California, primarily along continental shelf margins (USFWS, 2008).

3.2.3.3 Natural History

Nests consist of a divot on the ground lined with sand and vegetation with eggs hatch in late December and January. The diet of this species is not well studied; however, research suggests at sea during the non-breeding season that squid, crustaceans, and fish are important prey (USFWS, 2008). Short-tailed albatross spend much of their time feeding along the continental shelf-break areas in water depths between 656 to 3,280 ft (200 to 1,000 m). The marine environment most heavily used by short-tailed albatross includes areas characterized by upwelling and high productivity, specifically along the northern edge of the Gulf of Alaska, along the Aleutian Island Chain, and along the Bering Sea shelf break; however, juvenile albatross have been recorded migrating to the northern coast of California (USFWS, 2008).

3.2.3.4 Population Trends

The worldwide estimate, including both Torishima and Minami-kojima breeding colonies, is 1,114 breeding adults and 1,292 subadult short-tailed albatross.

3.3 TURTLES

3.3.1 Green Turtle (*Chelonia mydas*)

3.3.1.1 Status

The East Pacific distinct population segment (DPS) was listed as Federally threatened on April 2016. Critical habitat has been designated for the species in Puerto Rico, but none in the Project area (NMFS, 2015a).

3.3.1.2 Range and Habitat

Green turtles occur worldwide and are generally found in tropical and subtropical waters along continental coasts and islands between 30 degrees North and 30 degrees South. In the eastern North Pacific, green turtles have been sighted from Baja California to southern Alaska, but most commonly occur south of San Diego (NMFS, 2015a). In Southern California, there are two known colonies near the warm water outfalls from power plants: In San Diego Bay and in Orange County near the San Gabriel River (Argonne National Laboratory, 2019).

3.3.1.3 Natural History

Green turtles can weigh 300 to 350 pounds (lbs) (135 to 160 kilograms [kg]) and are three feet (one meter) in length. They are herbivorous, feeding primarily on algae and sea grasses. Nesting season varies depending on location, but in the southeastern U.S., females generally nest in the summer between June and September; peak nesting occurs in June and July. The Project area is not within the breeding range of the green sea turtle; however, green turtles are often seen foraging in coastal waters during summer months. The green sea turtle is usually seen in El Nino years when ocean temperatures are warmer than normal (Argonne National Laboratory, 2019).

3.3.1.4 Population Trends

Recent minimum population estimates for green turtles indicate that at least 20,112 individuals are known to occur in the eastern Pacific (NMFS, 2015a).

3.3.2 Loggerhead Turtle (*Caretta caretta*)

3.3.2.1 Status

The loggerhead was first listed as endangered throughout its range on July 28, 1978. In September 2011, NMFS and USFWS listed nine DPS of loggerhead turtles under the FESA. At that time, the North Pacific loggerhead turtle DPS was Federally listed as an endangered species (NMFS, 2011). Critical habitat is designated along the U.S. east coast for the Northwest Atlantic Ocean DPS. No critical habitat has been designated for the North Pacific DPS (NMFS, 2011).

3.3.2.2 Range and Habitat

Loggerheads are circumglobal, occurring throughout the temperate and tropical regions of the Atlantic, Pacific, and Indian Oceans. Loggerheads are the most abundant species of sea turtle found in coastal waters. Within the North Pacific, loggerhead nesting has been documented only in Japan, although low level nesting may occur outside of Japan in areas surrounding the South China Sea. In the South Pacific, nesting beaches are restricted to eastern Australia and New Caledonia and, to a much lesser extent, Vanuatu and Tokelau (NMFS, 2011). Southern

California is considered to be the northern limit of loggerhead turtle distribution in the eastern Pacific; however, loggerhead turtles have been stranded on beaches as far north as Alaska (NMFS 2011). In the U.S., nesting occurs only in Florida (NMFS, 2011). Sightings of loggerhead turtles tend to occur from July and September but can occur over most of the year during El Nino years when ocean temperature rise and the turtles are following pelagic red crabs, which are a preferred prey. The loggerhead turtles are primarily pelagic, but occasionally enters coastal bays, lagoons, salt marshes, estuaries creeks, and mouths of large rivers (Argonne National Laboratory, 2019).

3.3.2.3 Natural History

Loggerhead turtles primarily occur in subtropical to temperate waters and are generally found over the continental shelf. In the southeastern U.S., mating occurs in late March to early June and females lay eggs between late April and early September. Females can lay three to five nests during a single nesting season. Loggerhead sea turtles are primarily carnivorous, although they do consume some plant matter as well (NMFS and USFWS, 2008).

3.3.2.4 Population Trends

The north Pacific population of loggerhead turtles is declining (NMFS and USFWS, 2008).

3.3.3 Leatherback Turtle (*Dermochelys coriacea*)

3.3.3.1 Status

The leatherback turtle was listed as Federally endangered in 1970. NMFS designated critical habitat to provide protection for endangered leatherback sea turtles along the U.S. West Coast in January 2012 (NMFS, 2013). Critical habitat within California extends 16,910 square miles (43,798 square kilometers [sq. km.]) stretching from Point Arena to Point Arguello, east of the 9,842-ft (3,000-m) depth contour. The Project area is not located designated critical habitat for leatherback turtle.

3.3.3.2 Range and Habitat

Leatherback turtles are the most common sea turtle off the west coast of the U.S. Leatherback turtles have been sighted as far north as Alaska and as far south as Chile (NMFS, 2013) and their extensive latitudinal range is due to their ability to maintain warmer body temperatures in colder waters (NMFS, 2013). Off the U.S. west coast, leatherback turtles are most abundant from July to September; however, their presence off the U.S. west coast is “two pronged” with sightings occurring in northern California, Oregon, Washington, and southern California, with few sightings occurring along the intermediate (central California) coastline. Among foraging turtles tagged in coastal waters off California, the majority moved north and spent time in areas offshore of northern California and Oregon before moving towards the equatorial eastern Pacific, then eventually westward, presumably towards western Pacific Ocean nesting beaches (NMFS, 2013).

3.3.3.3 Natural History

The leatherback turtle can reach 2,000 lbs (900 kg) and get 6.5 ft (2 m) in length (Sea Turtle Conservancy, 2019). Their lifespan and age of sexual maturity are both unknown. Leatherback turtles are omnivores, but feed principally on soft prey items such as jellyfish and

planktonic chordates (e.g., salps) (Sea Turtle Conservancy, 2019). The leatherback turtle lacks a hard shell, and instead has a thick, leathery carapace consisting of connective tissue covering dermal bones. Female leatherbacks lay clutches of approximately 100 eggs on sandy, tropical beaches. Females nest several times during a nesting season, typically at eight to 12-day intervals. The eggs will incubate for 60-65 days before hatching (Sea Turtle Conservancy, 2019).

3.3.3.4 Population Trends

Leatherback turtle populations are decreasing worldwide; however, survey data is limited at foreign nesting beaches in the western and eastern Pacific (NMFS, 2013).

3.3.4 Olive Ridley Turtle (*Lepidochelys olivacea*)

3.3.4.1 Status

In 1978, the breeding populations of the olive ridley turtle on the Pacific coast of Mexico were listed as Federally endangered while all other populations were listed as Federally threatened. No critical habitat has been designed for the species.

3.3.4.2 Range and Habitat

This species is considered to be the most common of the marine turtles and is distributed circumglobally; however, it is rare to see an olive ridley turtle along the California coast (NMFS, 2014; Argonne National Laboratory, 2019). Within the eastern Pacific Ocean, olive ridley turtles typically occur in tropical and subtropical waters, as far south as Peru and as far north as California, but occasionally have been documented as far north as Alaska (NMFS, 2014). The olive ridley is mainly a "pelagic" sea turtle, but has been known to inhabit coastal areas, including bays and estuaries.

3.3.4.3 Natural History

Olive ridley turtles weigh on average 100 lbs (45 kg) and are 22 to 31 in (55 to 80 cm) in length. Their lifespan is unknown, but they reach sexual maturity around 15 years. Vast numbers of turtles come ashore and nest in what is known as an "arribada" during which hundreds to thousands of females come ashore to lay their eggs. At many nesting beaches, the nesting density is so high that previously laid egg clutches are dug up by other females excavating the nest to lay their own eggs. Major nesting beaches are located on the Pacific coasts of Mexico and Costa Rica (NMFS, 2014).

3.3.4.4 Population Trends

At-sea abundance estimates appear to support an overall increase in the Endangered breeding colony populations on the Pacific coast of Mexico (NMFS, 2014).

3.4 MARINE MAMMALS (*MYSTICETI*)

3.4.1 Blue Whale (*Balaenoptera musculus*)

The blue whale was listed as Federally endangered throughout its range in 1970 under the Endangered Species Conservation Act (ESCA) of 1969 prior to the passage of the FESA in 1973. No critical habitat has been designated.

3.4.1.1 Range and Habitat

Blue whales are distributed worldwide in circumpolar and temperate waters, and although they are found in coastal waters, they are thought to occur generally offshore compared to other baleen whales (Allen et al., 2011). Like most baleen whales, they migrate between warmer water breeding and calving areas in winter and high latitude feeding grounds in the summer. Feeding grounds have been identified in coastal upwelling zones off the coast of California primarily within two patches near the Gulf of the Farallon's and at the western part of the Channel Islands (Allen et al., 2011). They migrate seasonally between summer and winter, but some evidence suggests that individuals remain in certain areas year-round. Offshore California, sightings are made seasonally between June and December in the Southern California Bight (Allen et al*.,* 2011). Blue whales are frequently observed in the Santa Barbara Channel and around offshore oil platforms.

3.4.1.2 Natural History

Blue whales on average are 75 to 80 ft (21 to 24 m) in length and weigh 100 to 150 tons (90,700 to 136,000 kg) making it the largest animal on Earth (Allen et al., 2011). Blue whales have no known social structure and can be seen traveling alone or in groups of 19 to 80 individuals. Blue whales feed primarily on euphausiid shrimp (krill).

3.4.1.3 Population Trends

The most recent estimates of the blue whale indicate that a minimum of 1,551 individuals are known to occur off the west coast (NMFS, 2018a).

3.4.2 Fin Whale (*Balaenoptera physalus*)

3.4.2.1 Status

The fin whale was listed as a Federally endangered species in 1973, but no critical habitat has been identified for this species to date.

3.4.2.2 Range and Habitat

Fin whales are found in deep, offshore waters of all major oceans, primarily in temperate to polar latitudes, and less commonly in the tropics. Fin whales are migratory, moving seasonally into and out of high latitude feeding areas and their wintering areas are not widely known (NMFS, 2017). They are mostly commonly seen feeding over the continental shelf in areas of high productivity. Peak abundances of fin whales in the Southern California Bight occur after periods of maximum upwelling, in summer and fall (Allen et. al., 2011).

3.4.2.3 Natural History

Fin whales are on average 59 ft (18 m) in length and weigh 50 to 70 tons (45,000 to 64,000 kg) (Allen et al., 2011). Little is known about the social and mating systems of fin whales. It is believed that males become sexually mature at six to ten years of age; and females at seven to 12 years of age. Physical maturity is attained at approximately 25 years for both sexes. Usually mating and birthing occurs in tropical and subtropical areas during midwinter. Fin whales feed on euphasiid shrimp, copepods, and small fish. Fin whales are usually found in groups of two to seven whales and are considered fast swimmers (NMFS, 2017a).

3.4.2.4 Population Trends

The most recent estimates of the fin whale population indicate that at least 8,127 individuals are known to occur off California, Oregon, and Washington (NMFS, 2017a).

3.4.3 Humpback Whale (*Megaptera novaeangliae*)

3.4.3.1 Status

The humpback whale was listed as Federally endangered in 1970. In September 2016, NMFS revised the FESA listing for the humpback whale to identify 14 DPS, list one as threatened, four as endangered, and identify nine others as not warranted for listing. The humpback whale Central America DPS is listed as Federally endangered and the Mexico DPS is listed as a Federally threatened population, both DPS feed offshore of Oregon (NMFS, 2018b). No critical habitat has been designated.

3.4.3.2 Range and Habitat

Humpback whales are distributed worldwide and travel great distance during their seasonal migration, the farthest migration of any animal. Humpback whales spend the winter and spring months offshore of Central America and Mexico for breeding and calving, and then migrate to their summer and fall range between California and southern British Columbia to feed (Allen et al., 2011). Although humpback whales typically travel over deep, oceanic waters during migration, their feeding and breeding habitats are in shallow, coastal waters over continental shelves. Cold and productive coastal waters characterize feeding grounds (NMFS, 2018b). In the North Pacific, the California/Oregon/Washington stock winters in coastal Central America and Mexico and migrates to areas ranging from the coast of California to southern British Columbia in summer/fall (NMFS, 2018b).

3.4.3.3 Natural History

Humpback whales are on average 42 ft (13 m) in length and weigh 25 to 40 tons (22,600 to 36,200 kg). Humpback whales are well known for their long pectoral fins, which can be up to 15 ft (4.6 m) long. These extensive fins give them increased maneuverability and they can be used to slow down or even go backwards. During the summer months, humpbacks spend the majority of their time feeding and building up fat stores that they will live off of during the winter. Humpbacks filter feed on tiny crustaceans (mostly krill), plankton, and small fish (Allen et al., 2011).

3.4.3.4 Population Trends

The most recent population estimates of humpback whales indicate that at least 1,876 individuals occur off California, Oregon, and Washington (NMFS, 2018b). This population appears to be increasing.

3.4.4 North Pacific Right Whale (*Eubalaena japonica*)

3.4.4.1 Status

The northern Pacific right whale was listed as federally endangered in 2008. In April 2008, NMFS designate critical habitat in the Gulf of Alaska and within the Bering Sea (NMFS, 2017d). The Project area is not within designated critical habitat.

3.4.4.2 Range and Habitat

Northern right whales inhabit the Pacific Ocean, particularly between 20- and 60-degrees North latitude. They primarily occur in coastal or shelf waters, although movements over deep waters are known. For much of the year, their distribution is strongly correlated to the distribution of their prey. During winter, right whales occur in lower latitudes and coastal waters where calving takes place. However, the whereabouts of much of the population during winter remains unknown. Right whales migrate to higher latitudes during spring and summer (NMFS, 2017b). Few sightings of right whales occur in the central North Pacific and Bering Sea. Sightings have been reported as far south as central Baja California in the eastern North Pacific, as far south as Hawaii in the central North Pacific, and as far north as the sub-Arctic waters of the Bering Sea and sea of Okhotsk in the summer. (NMFS, 2017b).

3.4.4.3 Natural History

North Pacific right whales weighs up to 70 tons (63,500 kg) and can be 45 to 55 ft (13.7 to 16.7 m) in length (NMFS, 2017b). They are slow swimmers, reaching top speeds of 8 kilometers per hour (5 miles per hour), and spend a lot of time on the surface. These characteristics may contribute to their high incidence in ship strikes (Allen et al., 2011). Females give birth to their first calf at an average age of nine to ten years. This species feeds from spring to fall, and also in winter in certain areas. The primary food sources are zooplankton, including copepods, euphausiids, and cyprids. Unlike other baleen whales, right whales are skimmers: they feed by removing prey from the water using baleen while moving with their mouth open through a patch of zooplankton (NMFS, 2017b).

3.4.4.4 Population Trends

Photographic recapture rate population estimates for this species remain low, with only 26 individuals being photographed. No long-term population trends have been determined at this time (NMFS, 2018d).

3.4.5 Sei Whale (*Balaenoptera borealis*)

3.4.5.1 Status

The sei whale was listed as an endangered species in 1973. No critical habitat has been designated for the species (NMFS, 2019c).

3.4.5.2 Range and Habitat

Sei whales occur throughout most temperate and subtropical oceans of the world. The northern Pacific stock rarely ventures above 55 degrees N latitude or south of California (Allen et al., 2011). Sei whales are associated with areas of strong upwelling and mixing, where copepod densities would be high. Sei whales are most common offshore southern California from May through October, peaking in July (Allen et al., 2011).

3.4.5.3 Natural History

Sei whales are up to 40 to 60 ft (12 to 18 m) in length and can weigh up to 100,000 lbs (45,000 kg). Sei whales are among the fastest of all the rorqual whales, reaching speeds of 35 miles per hour (mph) (56 kilometer per hours [km/h]). Like most baleen whales, they migrate between warmer waters used for breeding and calving in winter and high latitude feeding grounds

where food is plentiful in the summer. The northern Pacific stock ranges almost exclusively in pelagic waters and rarely ventures into coastal waters (Allen et al., 2011; NMFS, 2019c). Sei whales tend to avoid ships, and therefore are rarely sighted (Allen et. al., 2011).

3.4.5.4 Population Trends

The most recent estimates of the sei whale northern Pacific stock population indicate that at least 374 individuals are known to occur off California, Oregon, and Washington (NMFS, 2019c).

3.5 MARINE MAMMALS (*ODONTECETI*)

3.5.1 Sperm Whale (*Physeter macrocephalus*)

3.5.1.1 Status

The sperm whale was listed as a federally endangered species in 1970 under the endangered Species Conservation Act of 1969. No critical habitat has been designated (NMFS, 2018e).

3.5.1.2 Range and Habitat

Sperm whales tend to inhabit areas with a water depth of 1,968 ft (600 m) or more and are uncommon in waters less than 984 ft (300 m) deep. Female sperm whales are generally found in deep waters (at least 3,280 ft [1,000 m]) of low latitudes (less than 40 degrees, except in the North Pacific where they are found as high as 50 degrees). These conditions generally correspond to sea surface temperatures greater than 59 degrees Fahrenheit (15 degrees Celsius), and while female sperm whales are sometimes seen near oceanic islands, they are typically far from land. Off California, sperm whales are present in offshore waters year-round, with peak abundance from April to mid-June and again from late August through November (Allen et al., 2011, NMFS, 2018e).

3.5.1.3 Natural History

Sperm whales are on average 36 to 53 ft (11 to 16 m) in length and weigh 50 tons (45,000 kg). Female sperm whales reach sexual maturity around 9 years of age when they are roughly 29 ft (9 m) long. One calf is produced every 5 years after a 14 to 16-month gestation period. Males reach physical maturity around 50 years and when they are 52 ft (16m) long. Sperm whales are the deepest divers of any marine mammals reaching depths of 1.2 mi (2 km) remaining under water for around one hour (Allen et. al., 2011). There are no known mating or birthing grounds, but both more than likely occur in lower latitudes between April and August (Allen et. al., 2011). Sperm whales feed on deep ocean water species of squid, octopus, and fish (NMFS, 2015b).

3.5.1.4 Population Trends

The most recent estimates indicate that at least 1,270 individuals are known to occur off California, Oregon, and Washington (NMFS, 2018e). Reported population numbers make the sperm whale population appear stable; however, population growth models range from negative to positive rates, so conclusions about whether the population has increased or decreased remain uncertain (NMFS, 2018e).

3.5.2 Killer Whale (*Orcinus orca*)

3.5.2.1 Status

Two potential designated stocks of killer whale have the potential to occur along the west coast of California, the West Coast transient and Southern Resident killer whale stocks. The West Coast transient killer whale stock is not designated as "depleted" under the MMPA or listed as threatened or endangered under the ESA. The Southern Resident stock experienced a population decline in the 1990's when NMFS listed the DPS as endangered under the ESA in November 2005.

3.5.2.2 Range and Habitat

Killer whales are found throughout the North Pacific. Along the west coast of North America, killer whales occur along the entire Alaskan coast, in British Columbia and Washington inland waterways, and along the outer coasts of Washington, Oregon, and California (NMFS, 2018f). Generally killer whales prefer colder and more productive water found at high latitudes; however, the Southern Resident killer whale population has been known to occur from central California to the Queen Charlotte Island's coast in British Columbia. The home ranges of the West Coast Transient whales also include the inland waters of Washington and may overlap with Southern Resident whales.

3.5.2.3 Natural History

Killer whales are the largest cetacean in the dolphin family. There are three identified ecotypes of killer whale: residents, transients, and offshore, although there can be considerable overlap in the geographic range. These ecotypes do not appear to interbreed. Differences between the ecotypes extend to their morphology, foraging ecology, and behavior. Southern resident whales are generally fish-eaters, while transient whales are often mammal-eaters (i.e., other small whales, seals and sea lions). Resident whales can be more vocal, especially when foraging or socializing, while transients are quiet hunters, presumably because their prey can hear within the frequency range of their vocalizations (NMFS, 2010).

3.5.2.4 Population Trends

The West Coast transient stock has seen rapid growth from the 1970's due to an increase in primary prey animals, harbor seals; however, population growth started slowing in the 1990's and has continued to slow in recent years. Given population estimates are based on photo identification of individuals and considering minimum estimates, no reliable estimate of trend is available (NMFS, 2018f).

The Southern Resident stock saw a peak number of whales in 1995, at 99 individuals, but the population size has declined at currently stands at 77 animals as of the 2017 census (NMFS, 2018f).

3.6 MARINE MAMMALS (PINNIPEDS)

3.6.1 Guadalupe Fur Seal (*Arctocephalus townsendi*)

3.6.1.1 Status

The Guadalupe fur seal was listed as a federally threatened species in 1985 due to the near extinction by commercial seal hunting in the 19th century. No critical habitat has been designated.

3.6.1.2 Range and Habitat

The Guadalupe fur seal range is from Guadalupe Island, Mexico north to the California Channel Islands, but individuals are occasionally sighted as far south as Tapachula near the Mexico-Guatemala border and as far north as Mendocino, California (Allen et al., 2011). As their numbers increase, Guadalupe fur seals are expanding their range and are regularly seen on San Miguel and San Nicolas Islands, and, occasionally, on the South Farallon Islands. During breeding season, they are found in coastal rocky habitats and caves. Little is known about their whereabouts during the non-breeding season (NMFS, 2017b). Presently, the species breed only on Isla de Guadalupe off the coast of Baja California, Mexico, however, since 2008, individual adult females, subadult males, and between one and three pups have been observed annually on San Miguel Island (NMFS, 2017b).

3.6.1.3 Natural History

Guadalupe fur seals are on average 4 to 8 ft (1.2 to 2.4 m) and weigh 110 to 375 lbs (50 to 170 kg), with highly dimorphic appearances (Allen et al., 2011). Guadalupe fur seals are solitary, non-social animals. Males are "polygamous" and may mate with up to 12 females during a single breeding season. Males form small territories that they defend by roaring or coughing. Breeding season is June through August. Females arriving in early June, and pups are born a few days after their arrival (NMFS, 2017b). Guadalupe fur seals feed mainly at night on squid, mackerel, and lantern fish by diving up to depths of 65 feet (20 m) (NMFS, 2017b).

3.6.1.4 Population Trends

Recent population estimates for the Guadalupe fur seal in Mexico is 15,830 individuals. Population estimates appear to show that the population is increasing (NOAA, 2017b).

4.0 IMPACT ASSESSMENT

This BA has been prepared to provide information to the Federal lead agencies, NMFS and the USFWS, to determine the potential to affect threatened or endangered species, based on one of three possible findings for each species potentially affected:

- No effect: the proposed action will not affect the listed species or critical habitat;
- Not likely to adversely affect: effects of the listed species are expected to be discountable (extremely unlikely to occur), insignificant (minimal impact without take), or beneficial; and
- Likely to adversely affect: adverse effect may occur as a direct or indirect result of the proposed action, and the effect is not discountable, insignificant or beneficial.

Potential impacts due to Project activities includes seafloor disturbance and loss of habitat structure during conductor removal, potential increase in underwater noise, potential vessel strikes, and degradation of water quality or seafloor habitats from the discharge of petroleum in the event of an accidental spill from Project vessels. Potential impacts are described below.

4.1 SEAFLOOR DISTURBANCE

The cutting and subsequent removal of conductors from each platform has the potential to create localized turbidity and affect nearby soft-bottomed seafloor habitat beneath the platform. These potential impacts include:

- The removal of marine growth prior to the conductor cutting;
- The increase in sediment suspension and potential subsurface discharge following cutting of the conductor with either abrasive or mechanical equipment; and
- The subsequent void and infill of the seafloor depression as the conductor is lifted from the seafloor.

Prior to removal, the external conductor surface will be cleaned of naturally occurring marine growth. As epibiota is detached from each conductor it will fall to the sea floor. For the duration of the Platforms' production operations, BSEE regulations required operations of offshore platforms to clear marine growth from shallow, submerged portions of the Platforms on a regular basis to reduce structure fatigue. Over time, this removed growth accumulates on the seafloor beneath the Platforms. The cleaning process is anticipated to result in some increased turbidity as these materials fall through the water column and again as it reaches the seafloor. The in suspended materials will rapidly disperse once the cleaning operation is completed. The resulting material added to the seafloor beneath the Platform is anticipated to contribute to benthic habitat that has been shown as a favored substrate for many juvenile rockfishes (Meyer-Gutbrod et al., 2019) and may contribute to a short-term increase in food availability within the water column.

During conductor cutting operations, there is the potential for the subsurface (15 feet below the mudline) discharge of cutting fluid (i.e., seawater, abrasive materials, steel cuttings) that may cause a short-term disturbance of the sediment around the conductor. As the conductor is pulled towards the surface, there is also the potential for minor amounts of cutting fluid to drift out of the cut site. These discharges will occur intermittently throughout the duration of the Project

(120 days at Platform Grace in 2021 and 240 days at Platform Gail in 2023). Turbidity in the water column will increase as the conductor is pulled to the surface, however; due to the 15-foot-deep cutting depth, this majority of cutting fluid will be buried beneath seafloor and disturbance is expected to be minimal.

Potential impacts could also occur as the conductors are pulled from the seafloor and expose the 15-foot-deep footprint of the cut conductor. As natural sediments move to fill the void, suspended sediments will create turbidity that would reduce water clarity and increase sediment deposition. This disturbance would also be localized and short-term, as water conditions and seafloor topography would be expected to return to natural conditions following Project completion.

Due to the exposed nature of the artificial hard substrate near the surface and lack of preferred food (kelp), protected invertebrate species are not expected to occur at the Project Platforms. There are no other threatened or endangered species that would be impacted by the potential seafloor disturbance; therefore, the impact is expected to have no effect.

4.2 LOSS OF HABITAT STRUCTURE

Chevron will remove 38 conductors from Platform Grace and 28 conductors from Platform Gail. Removal of the conductor pipes will reduce the surface area of artificial hard substrate by 26 percent for Platform Grace and 17 percent for Platform Gail. The removal of the conductors will result in a permanent decrease in available vertical structure and complexity of artificial habitat available within the water column. This reduction is only a small percentage of the existing structure present within the Platform jackets. The reduction in surface area and complexity has the potential to relocate the fish and invertebrate populations that utilize the area within the conductor footprint, to other areas within and around the platform structure.

There are no federally threatened or endangered fish species that have the potential to occur within the Project area. After conductor removal, the remaining platform structure and jacket is expected to continue to support invertebrate and fish habitat and the reduction in habitat is not anticipated to negatively affect the fish density or production; therefore, the loss of habitat is expected to have no effect on threatened or endangered species that feed on associated fish or invertebrate species.

4.3 NOISE AND LIGHT IMPACTS

4.3.1 Noise During Conductor Cutting

During conductor cutting there is the potential for an intermittent increase in underwater noise for approximately 120 days at Platform Grace in 2021 and 240 days at Platform Gail in 2023 with the highest potential noise source being at seafloor where the subsurface cutting noise may reverberate through the sedimentary substrate and the conductor string. Abrasive cutting techniques for the initial cut(s) are anticipated to take approximately seven hours per conductor. Mechanical cutting techniques are anticipated to take approximately 12 to 24 hours per conductor, depending on the number of internal strings of pipe that need to be cut. However, in comparison to the use of explosives, the proposed methodology utilizing Iron Silicate Abrasives and/or mechanical cutting methods within the conductors' interior, will significantly reduce the potential underwater noise levels associated with the Project.

Although there are no studies that evaluate noise associated with the use of subsurface abrasive cutting or internal mechanical methods, previous conductor cutting projects have utilized the noise characteristics of diamond wire cutting in conductor removal operations as a surrogate for the anticipated underwater noise levels (BOEM, 2020, Pangerc et al. 2017). BOEM (2020) cited the diamond wire abrasive cutting has an in-water sound source level of 154 decibels (dB) re 1 microPascal (µPa) at one meter from the sound source. This study determined that the noise generated from diamond wire cutting are not easily discernible above the background noise (i.e., vessel and operations noise). Noise generated during Project conductor cutting will be dampened by the 15-feet of sediments above the cut; therefore, received sound levels are expected to be lower than those created during in-water abrasive diamond wire cutting.

As such, noise levels are not expected to be of high enough energy to cause pathological or physiological effects; however, there is the potential for temporary behavioral changes in the form of avoidance of the Project area. Behavioral effects include changes in the distribution, migration, and reproduction behaviors of exposed animals.

Marine Mammals and Turtles. Marine mammals may behaviorally react to sound when exposed to anthropogenic noise. These behavioral reactions are often shown as: changing durations of surfacing and dives, number of blows per surfacing, or moving direction and/or speed; reduced/increased vocal activities; changing/cessation of certain behavioral activities (such as socializing or feeding); visible startle response or aggressive behavior (such as tail/fluke slapping or jaw clapping); avoidance of areas where noise sources are located; and/or flight responses (e.g., pinnipeds flushing into water from haul-outs or rookeries).

The biological significance of many of these behavioral disturbances is difficult to predict, especially if the detected disturbances appear minor. However, the consequences of behavioral modification could be expected to be biologically significant if the change affects growth, survival, and/or reproduction. Some of these significant behavioral modifications include:

- Drastic change in diving/surfacing patterns;
- Habitat abandonment due to loss of desirable acoustic environment; and,
- Cessation of feeding or social interaction.

While conductor cutting is in process the sound source will be continuous in nature and will not create dramatic increases in sound pressures as created by impulsive noise sources (i.e., pile driving). As discussed above, the noise created will attenuate through the sand and conductor walls before entering the water column which, by design is expected to reduce potential noise levels to below impact thresholds. Additionally, well conductor cutting events will occur intermittently at the platforms, and the overall spatial and temporal overlap with marine mammals and sea turtle species will be low during these activities; therefore, it is anticipated that noise associated with the proposed action will have negligible effects on marine mammal and sea turtle species (Argonne National Lab, 2019).

4.3.2 Project Lighting

The lighting required to conduct Project activities on a 24/7 schedule will be the same as the existing operations lighting on the Project Platforms. Adverse effects to migrating birds due to the lights on offshore platforms appear to be an infrequent occurrence (Johnson et al., 2011).

Interactions between the observed migrating birds and the Platforms appear to be due more to the general patterns of migration rather than platform location or design (Johnson et al., 2011).

The Project Platforms will continue to direct all lighting downward and toward the active working deck to reduce light pollution and any adverse effects to marine wildlife. The Platforms will also continue to follow all navigational safety requirements in accordance with the U.S. Coast Guard (USCG). The effects of lighting from Project activities are not likely to affect threatened or endangered species.

4.4 VESSEL TRAFFIC

The OSV *Adele Elise* is the primary vessel planned for use for this Project. The length is 225-feet with a maximum speed of 10.2 knots. A support vessel, the M/V *Jackie C.* will be utilized twice daily for supplies and transport of the crew. The *Jackie C.* currently makes routine runs twice daily to the Platforms in support of current operations. The *Jackie C.* is a 120-foot vessel with a maximum speed of 19 knots. Project activities are currently estimated at 120 days in 2021 for Platform Grace and 240 days in 2023 for Platform Gail. During this time, approximately 48 vessel trips total (16 trips or an average of 1 trip/week for Platform Grace and 32 trips or an average of 1 trip/week for Platform Gail) utilizing the *Adele Elise* will be made from the Platforms to the POLB or Port Hueneme, and the twice daily crew boat trips from Carpinteria (Casitas) Pier to the Platforms using the *Jackie C* will continue throughout the Project.

During these trips, Project vessels will utilize (or continue to utilize) the existing U.S. Coast Guard Traffic Separation Scheme (VTSS) and Joint Oil Fisheries Liaison Office (JOFLO) corridors within the Santa Barbara Channel. During Project-related transit, captains will remain at least 100 m away from all sighted whale species, and 50 m away from dolphins and sea turtles. Transit vessel speed will be reduced when feasible to minimize the potential for vessel strikes with marine wildlife. Due to the small size of the proposed Project vessels, in combination with the use of established vessel traffic lanes, potential vessel strikes with marine wildlife are not likely to affect threatened or endangered species.

4.5 OIL SPILL POTENTIAL

Prior to the Project, as part of the well plug and abandonment program, each well will be plugged in accordance with BSEE regulations; therefore, there is no potential for hydrocarbon release from the Project Platforms' wells.

The unintentional release of petroleum into the marine environment from proposed Project activities is limited to Project 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 (i.e., diesel, gasoline.) are more toxic than heavier crude or Bunker-type products, and the loss of a substantial amount of fuel or lubricating oil during survey operations could affect the water column, seafloor, intertidal habitats, and associated biota, resulting in their mortality or substantial injury, and in alteration of the existing habitat quality.

Although many marine organisms have created adaptive strategies to survive in their environment, when these marine organisms are introduced to oil, it adversely affects them physiologically. For example, physiological effects from oil spills on marine life could include the

contamination of protective layers of fur or feathers, loss of buoyancy, and loss of locomotive capabilities. Direct lethal toxicity or sub-lethal irritation and temporary alteration of the chemical make-up of the ecosystem could also occur. The following text provides a brief summary of the potential impacts from exposure to oil spills.

4.5.1 Marine Invertebrates

Oil spill impacts on sensitive marine invertebrates, including the white and black abalone, would likely result from direct contact, ingestion of contaminated water and food (algae), and secondary impacts associated with response operations. Although abalone species are not expected to occur in the Project area, coastal areas in the Project region may provide habitat for protected abalone species (i.e., Anacapa Island). In the event of a spill related to the proposed Project activities, the oil could undergo some weathering before reaching the mainland or Channel Islands, which could limit toxicity; however, depending on the amount and the prevailing wind and currents, there is the potential that oil could compromise critical habitat areas for abalone outside of the Project area. Due to the small size of the proposed Project 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 threatened or endangered invertebrate species.

4.5.2 Turtles

Oil spills are not considered a high cause for mortality for sea turtles, although reports from the Gulf of Mexico Deepwater Horizon spill indicate a possible increase in strandings of oil impacted turtles. Since sea turtle species have been listed as threatened or endangered under the FESA, there is very little direct experimental evidence about the toxicity of oil to sea turtles. Sea turtles are negatively affected by oil at all life stages: eggs on the beach, post hatchings, young sea turtles in near shore habitats, migrating adults, and foraging grounds. Each life stage varies depending on the rate, severity, and effects of exposure.

Sea turtles are more vulnerable to oil impacts due to their biological and behavior characteristics including indiscriminate feeding in convergence zones, long pre-dive inhalations, and lack of avoidance behavior (Milton et al., 1984). A sea turtle's diving behavior puts individuals at risk because they inhale a large amount of air before diving and will resurface over time. During an oil spill, this would expose sea turtles to longer periods of both physical exposure and petroleum vapors, which can be the most harmful during an oil spill. Due to the small size of the proposed Project 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 threatened or endangered marine turtle species.

4.5.3 Marine Birds

Marine birds can be affected by direct contact with oil in three ways: (1) thermal effects due to external oiling of plumage; (2) toxic effects of ingested oil as adults; and (3) effects on eggs, chicks, and reproductive abilities.

The loss of waterproofing is the primary external effect of oil on marine birds and buoyancy can be lost if the oiling is severe. A main issue with oil on marine birds is the damage oil does to the arrangement of feathers, which is responsible of water repellency (Fabricius, 1959). Without water repellency, the water can go through the dense layers of feathers to the skin exposing the

bird to cold water temperatures. To survive, the bird must metabolize fat, sugar, and eventually skeletal muscle proteins to maintain body heat. The cause of oiled bird deaths can be the result from exposure and loss of these energy reserves as well as the toxic effects of ingested oil (Schultz et al., 1983). The internal effect of oil on marine birds varies. Anemia can be the result of bleeding from inflamed intestinal walls. Oil passing into the trachea and bronchi could result in the development of pneumonia. A bird's liver, kidney, and pancreatic functions can be disturbed due to internal oil exposure. Ingested oil can inhibit a bird's mechanism for salt excretion that enables seabirds to obtain fresh water from salt water and could result in dehydration (Holmes and Cronshaw, 1975).

A bird's vulnerability to an oil spill depends on each individual species' behavioral and other attributes. Some of the more vulnerable species are alcids and sea ducks due to the large amount of time they spend on the ocean surface, the fact that they dive when disturbed, and their gregarious behavior. A bird's vulnerability depends on the season as well. For example, colonial seabirds are most vulnerable between early spring through autumn because they are tied to breeding colonies. There are no breeding colonies of protected bird species within the Project areas; therefore, impacts from oil to breeding bird colonies is not anticipated. Due to the small size of the proposed Project 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 threatened or endangered bird species.

4.5.4 Marine Mammals

The impact of direct contact with oil on the animal's skin varies by species. Cetaceans have no fur; therefore, they are not susceptible to the insulation effects of hypothermia in other mammals. However, external impacts to cetaceans from direct skin contract with oil could include: eye irritation, burns to mucous membranes of eyes and mouth, and increase vulnerability to infection.

Baleen whales skim the surface of water for feeding and are particularly vulnerable to ingesting oil and baleen fouling. Adult cetacean would most likely not suffer from oil fouling of their blowholes because they spout before inhalation, clearing the blowhole. Younger cetaceans are more vulnerable to inhale oil. Internal injury from oil is more likely for cetaceans due to oil. Oil inhaled could result in respiratory irritation, inflammation, emphysema, or pneumonia. Ingestion of oil could cause ulcers, bleeding, and disrupt digestive functions. Both inhalation and ingested chemicals could cause damage in the liver, kidney, lead to reproductive failure, death, or result in anemia and immune suppression.

4.5.4.1 Marine Mammals (Pinnipeds)

Pinnipeds that come in contact with oil could experience a wide range of adverse impacts including: thermoregulatory problems, disruption of respiratory functions, ingestions of oil as a result of grooming or eating contaminated food, external irritation (eyes), mechanical effects, sensory disruption, abnormal behavioral responses, and loss of food by avoidance of contaminated areas.

Guadalupe fur seals could experience thermoregulatory problems if they come into contact with oil (Geraci and Smith, 1976). Oil makes hair of a fur seal lose its insulating qualities. Once this happens, the animal's core body temperature may drop and increases its metabolism

to prevent hypothermia. This could potentially be fatal to a distressed or diseased animal and highly stressful for a healthy animal (Engelhardt, 1983).

When pinnipeds are coated with viscous oil, it may cause problems in locomotion and breathing. Pinnipeds that are exposed to heavy coating from oil will experience swimming difficulties, which may lead to exhaustion (Engelhardt, 1983; Davis and Anderson, 1976), and possible suffocation from breathing orifices that are clogged. The viscosity of the oil is a major factor in determining the effects on pinnipeds. Severe eye irritation is caused by direct contact with oil but non-lethal (Engelhardt, 1983). Skin absorption, inhalation, and ingestion of oil while grooming are all possible pathways of ingestion. However, there have not been enough studies on the long-term effects of chronic exposure to oil on pinnipeds.

Project activities are not expected to have long-term, significant effects on open water habitat. Platform-specific oil spill contingency and response plans have been developed and will be used to direct the containment and recovery of any Project-related vessel 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 Project vessels will adhere to a zero-discharge policy. Refer to Section 5.1 for more information on applicant proposed mitigation measures. Due to the small size of the proposed Project 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 threatened or endangered marine mammal species.

5.0 MEASURES TO REDUCE POTENTIAL PROJECT RELATED IMPACTS

The proposed well conductor cutting and removal program has been designed to minimize the potential for adverse impacts to the surrounding marine environment. The Project will implement the following measures to ensure the potential for impacts are reduced to the extent feasible.

- Conductor cutting and removal activities will be conducted in accordance with Bureau of Safety and Environmental Enforcement (BSEE) Requirements (30 CFR Part 250.1710-1723) for decommissioning activities associated with the existing operational plans at Platforms Grace and Gail.
- As part of the well plug and abandonment program, the wellheads will have been removed and each well plugged in accordance with BSEE regulations prior to conductor cutting/removal activities.
- Conductor cutting and removal activities have been scheduled in one phase at each Platform to minimize Project timing and associated impacts.
- No anchoring has been proposed to minimize potential seafloor disturbance.
- Chevron has designed the Project to utilize internal conductor cutting methodologies to minimize potential noise impacts and potential discharges.
- Initial conductor cuts will be performed approximately 15 feet below mudline to minimize turbidity.
- Existing marine growth on the conductors will be cleared prior to conductor removal activities.
- Chevron will implement its existing agency-approved Oil Spill Contingency and Response Plans and Hazardous Materials Management Plans for both Platform Grace and Gail. These plans will be used to direct the containment and recovery of Project-related petroleum products in the event that they are accidentally released into the marine waters. Each Project vessel will have supporting spill kit equipment and will implement procedures specified in the spill plan to reduce the effects of accidentally discharged petroleum by facilitating rapid response and cleanup operations. The Project vessels will adhere to a zero-discharge policy.

6.0 CUMULATIVE EFFECTS

FESA Regulations at 50 CFR 402.14(g)(3)(4) require Federal agencies to "evaluate the effects of the action and cumulative effects on the listed species or critical habitat" and "formulate its biological opinion as to whether the action, taken together with cumulative effects, is likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat."

According to the Endangered Species Consultation Handbook (USFWS and NMFS, 1998), cumulative effects include the effects of future State, local or private actions that are reasonably certain to occur in the action area considered in a biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of FESA. Indicators of effects "reasonably certain to occur" may include but are not limited to: approval of the action by State or local agencies or governments (e.g., permits, grants); indications by granting authorities that an action is imminent; assurances by project sponsors that an action will proceed; the obligation of venture capital; and/or initiation of contracts. Speculative non-Federal actions that may never be implemented are not factored into cumulative effects analyses. The following is a summary of the other marine projects conducted or proposed in the Project area.

6.1 COMPLETED PROJECTS

Freeport-McMoRan (Freeport) has submitted an application to the BSEE and BOEM for removal of conductors at Platforms Hermosa, Harvest, and Hidalgo. These activities include 62 well conductors on the Point Arguello facilities: Hidalgo (14), Harvest (19) and Hermosa (29). Removal occurred in two phases: the initial conductor casing cutting/proving and conductor casing extraction. Total duration expected for Phase 1 was 78 days and Phase 2 was expected to require 130 days for a total project duration of 208 days. The Freeport conductor removal project is ongoing but is anticipated to be completed prior to initiation of conductor cutting and removal activities at Platform Grace in 2021.

6.2 PROPOSED PROJECTS

There are no known proposed projects in the region that would contribute to the cumulative effects of the Project.

7.0 CONCLUSION AND DETERMINATION

Implementation of the conductor cutting and removal Project will involve potential impacts to marine species and habitats that could affect listed and/or proposed species in the Project area. A total of 17 listed marine species have been analyzed in this BA. Table 7.0-1 below provides an analysis of the potential Project effects on the following: habitat loss, mortality, harassment, loss of prey, loss of shelter/cover, loss of access to habitats, noise and light effects, habitat fragmentation, urbanization, increased predation, and critical habitat.

The proposed Project may affect, but is not likely to adversely affect the listed species for the following reasons:

- The Project would not involve temporary or permanent loss of critical habitat;
- The Project would be of limited size and geographic effect; and,
- The Project will include avoidance, minimization, and mitigation measures, as detailed in Section 5.0, to avoid and minimize potential adverse effects.

Table 7.0-1. Potential Effects Matrix for Protected Species

Species	Loss of Habitat[1]	Mortality[2]	Harassment[3]	Loss of Prey[4]	Loss of Cover[5]	Loss of Access[6]	Noise/Light[7]	Fragmentation[8]	Urbanization[9]	Predation[10]	Critical Habitat[11]	Effect Determination[12]
White abalone	a	a	a	a	a	a	a	a	a	a	a	a
Black abalone	a	a	a	a	a	a	a	a	a	a	a	a
California Least Tern	a	a	a	a	a	a	a	a	a	a	a	a
Marbled Murrelet	a	a	a	a	a	a	a	a	a	a	a	a
Short-tailed Albatross	a	a	a	a	a	a	a	a	a	a	a	a
Green Turtle	b	b	b	b	b	b	b, c	b	a	b	b	b
Loggerhead Turtle	b	b	b	b	b	b	b, c	b	a	b	b	b
Olive Ridley Turtle	a	a	a	a	a	a	a	a	a	a	a	a
Leatherback Turtle	b	b	b	b	b	b	b, c	b	a	b	b	b
Blue Whale	b	b	b	c	b	b	b, c	b	a	b	a	b
Fin Whale	b	b	b	c	b	b	b, c	b	a	b	a	b
Humpback Whale	b	b	b	c	b	b	b, c	b	a	b	a	b
Northern Pacific Right Whale	a	a	a	a	a	a	a	a	a	a	a	a
Sei Whale*	a	a	a	a	a	a	a	a	a	a	a	a
Sperm Whale	b	b	b	c	b	b	b, c	b	a	b	a	b
Killer Whale	a	a	a	a	a	a	a	a	a	a	a	a
Guadalupe Fur Seal	b	b	b	c	b	b	b, c	b	a	b	a	b

[1]Loss of Habitat Codes
a. Species not expected to occur in Project area.
b. No habitat will be temporarily or permanently lost.

[2]Mortality Codes
a. Species not expected to occur in Project area.
b. Oil spills or the release of other pollutants from the Project equipment or vessels is a low probability event based on the nature of the operation.

[3]Harassment
a. Species not expected to occur in Project area.
b. Minor increases in underwater noise are not expected to harass wildlife.

[4]Loss of Prey
a. Species not expected to occur in Project area.
b. Prey species do not occur in Project area.
c. No permanent loss of prey expected. Short-term displacement of prey from immediate area of operations could occur.

[5]Loss of Shelter/Cover
a. Species not expected to occur in Project area.
b. No temporary or permanent loss of shelter/cover will occur.

[6]Loss of Access
a. Species not expected to occur in Project area.
b. No temporary or permanent loss of access.

[7]Noise/Light Impacts
a. Species not expected to occur in Project area.
b. Minor increases in underwater noise are not expected to harass wildlife.
c. Platforms lighting would be consistent with existing operations lighting.

[8]Habitat Fragmentation
a. Species not expected to occur in Project area.
b. No temporary or permanent loss of habitat will occur. Consequently, no fragmentation.

[9]Urbanization
a. Not applicable

[10]Increased Predation
a. Species not expected to occur in Project area.
b. Project activities do not affect likelihood of species predation.

[11]Critical Habitat
a. No critical habitat designated for species.
b. Critical habitat designated for species, but none occurring in Project area.

[12]Effect Determination
a. No effect
b. May affect, but not likely to adversely affect
c. May affect and likely to adversely affect

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APPENDIX E

Essential Fish Habitat Assessment

ESSENTIAL FISH HABITAT ASSESSMENT

SANTA CLARA UNIT (PLATFORMS GRACE AND GAIL) CONDUCTOR CUTTING PROGRAM OFFSHORE VENTURA, CALIFORNIA

Project No. 2002-5111

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1.0 INTRODUCTION

In support of a permit application to National Marine Fisheries Service (NMFS), and to satisfy the requirements of Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act, the following assessment of potential impacts to Essential Fish Habitat (EFH) has been prepared. This EFH assessment is for the Chevron West Coast Decommissioning (Chevron WCD) Santa Clara Unit (SCU) Conductor Cutting Program at Platforms Grace and Gail. This assessment is prepared in accordance with 50 Code of Federal Regulations (CFR) 600.920(g)(2) and addresses the managed fish and invertebrate taxa that could occur at the Project site.

1.1 PROPOSED ACTION

Chevron WCD proposes to remove the conductors at both Platforms Grace and Gail in accordance with Bureau of Safety and Environmental Enforcement (BSEE) requirements. The SCU facilities are located within Federal Outer Continental Shelf (OCS) waters and include Platforms Grace (OCS P-217) and Gail (OCS P-0205) (Figure 1.1-1). The Project proposes to cut the conductors 15 feet (ft) (4.5 meters [m]) below the seafloor and recover each conductor to the deck of the Platform. Prior to removal operations, the conductors will be cleaned of marine growth using divers with water jetting tools. In addition to diver operations, a water jetting ring will be attached to each conductor below the water line prior to jacking operations to continue removal of any attached marine growth on the lower sections of the conductor.

Abrasive material or mechanical cutting methods will be utilized to make the cuts from inside the conductor and through the outer casing(s). The abrasive material will be made up of Sharpshot© Iron Silicate Abrasives. The average conductor cut requires approximately seven hours, or approximately 3,500 lbs. of material for abrasive material cutting methodology and twelve to twenty-four hours for the mechanical cutting methodology. Conductors will be recovered in multiple sections.

The cut conductor pipe will be pulled up to the Platform deck using a casing jack or hydraulic hoist and then placed onto the Platform staging area(s) to be cut into smaller segments utilizing a mechanical cutting tool. Topside cuts will require approximately 3 hours each once the conductors have been lifted from the seafloor.

The cut pipe will be stacked on the Platform deck and then transferred to the OSV *Adele Elise* for transport to SA Recycling in the Port of Long Beach (POLB) or brought to Port Hueneme for trucking to Standard Industries in Saticoy, Ventura County, California. Once all well conductors on Platform Grace are completed in 2021, the Platform equipment and support vessels will be demobilized and will return to complete well conductor removal activities on Platform Gail in 2023.

1.1.1 Project Schedule

The proposed activities, including mobilization and demobilization, are expected to take approximately 360 operational days to complete. Work at Platform Grace would take approximately 120 days (4 months), and removal at Platform Gail would take approximately 240 days (8 months). The conductor cutting and removal is targeted for at Platform Grace in the 3rd quarter of 2021, following completion of well Temporary Abandonment (TA) prior to final removal

(anticipated to be completed by the 1st quarter of 2021) and all required environmental reviews and permitting. Conductor cutting and removal is targeted at Platform Gail in the 2nd through 3rd quarter of 2023, following completion of well TA and all required environmental reviews and permitting.

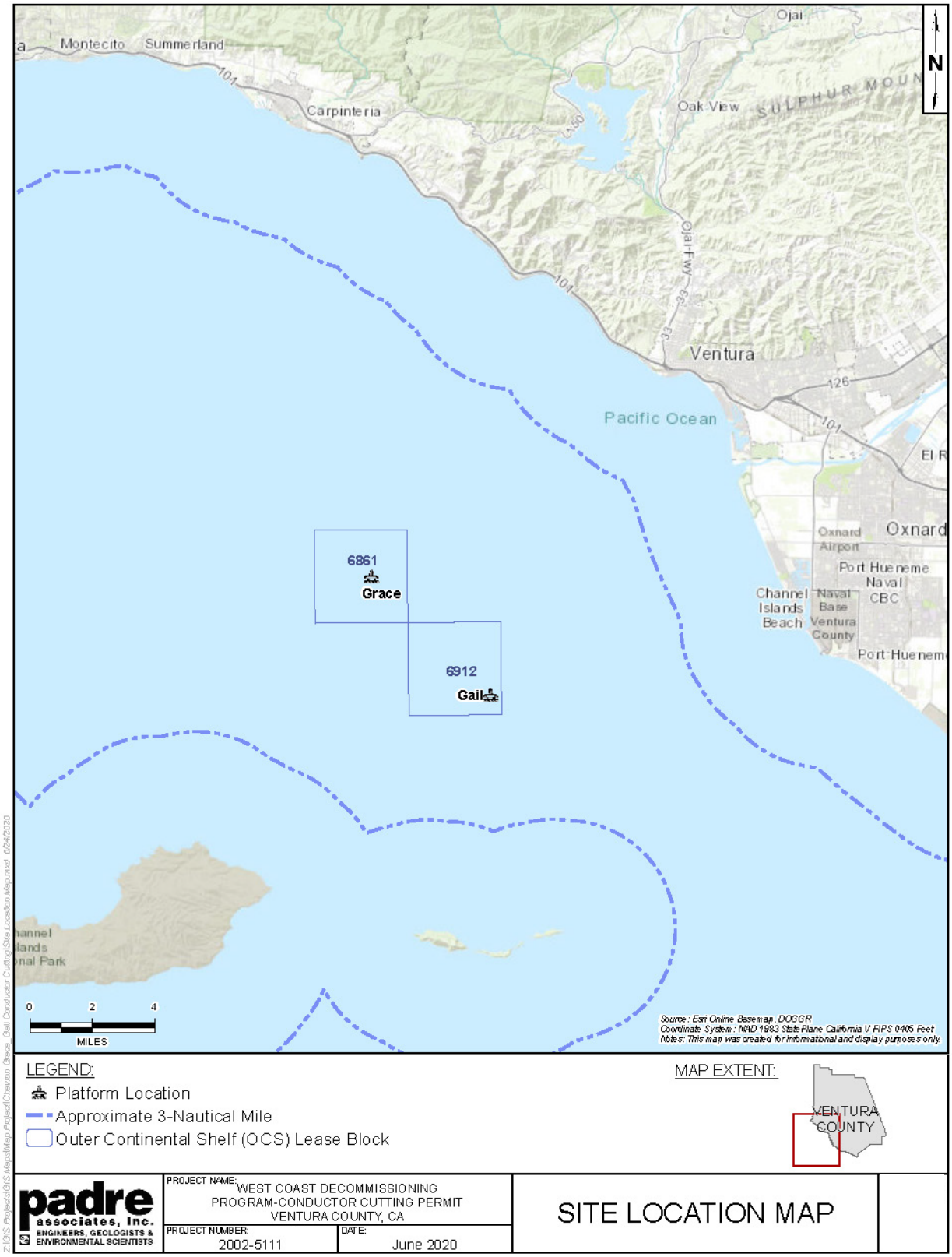

Figure 1.1-1. Site Location Map

2.0 EXISTING CONDITIONS

The Project is located at Platforms Grace and Gail offshore of Ventura, California in approximately 318 and 739 ft (97 and 225 m) of water, respectively. Platform Grace was installed first and become operational in 1980. Platform Gail become operational in 1988. Chevron is responsible for the decommissioning of the two Platforms, which are currently operated by Beacon West. When these Platforms were active, produced oil and gas was transported from Platform Gail to Platform Grace by subsea pipelines. Produced oil and natural gas were then transported to Chevron's onshore separation and treatment facilities in Carpinteria, Santa Barbara County. The Platforms were shut-in in November 2017 following bankruptcy of the previous operator (Venoco). The Venoco bankruptcy resulted in the relinquishment of the leases.

The platforms' structure and surrounding seafloor support diverse populations of invertebrate and fish species; however, existing conditions at each Platform differ slightly due to differences in water depth at each location. The existing conditions for each platform are presented below.

2.1 PLATFORM GRACE

Habitats and seafloor sediments within the Project area at Platform Grace have been characterized by several previous studies (Clearwater Port, 2006; Love et. al, 2000; Love et. Al, 2003; MEC Analytical Systems, 2003). The seafloor around Platform Grace is sedimentary, comprised of medium to fine grain sand and silts (Fugro West, 2003 and 2005). The Platform's shell mound area measures approximately 78,000 square feet (ft^2) (7,246 square meters [m^2]) on the northwest side of the Platform footprint and is approximately 13 ft (4 m) tall (MEC Analytical Systems, 2003).

Epibiota and fish communities associated with Platform Grace were characterized by Milton Love submersible and diver surveys (1999, 2000, 2003), Clearwater Port Remote Operated Vehicle (ROV) Surveys (2006), and MBC surveys (1987). Previous studies observed that the upper 25 to 30 ft (7 to 9 m) of the Platform Grace structure was composed of epibiota communities including barnacles and mussels and two species of anemone (*Metridium senile* and *Corynactis californica*) which is also commonly attached on the deeper sections of the Platform. The macroepibiota community on the shell mounds is dominated by seastars (*Pisaster*, *Asterina*, and *Pycnopoidia*), rock crabs (*Cancer* spp.), small gorgonian corals, and the same anemone species listed above.

Fish species reported from the surface to mid-water range (to approximately 100 ft [33 m]) include blacksmith (*Girella nigricans*), halfmoon (*Medialuna californiensis*), widow rockfish (*Sebastes entomelas*), squarespot (*S. hopkinsi*) and blue rockfish (*S. mystinus*), and pelagic species such as sardines (*Sardinops sagax*) and barracuda (*Sphyraena argentea*) (Love et. al, 2003; Clearwater Port, 2006). Meyer-Gutbroad et al. (2019) reported that the average fish density at the submerged structure of Platform Grace between the surface and 114 ft (35 m) structure was 52 fish per 1,076 ft^2 (100 m^2).

Species found near the bottom of the Platform legs and on the shell mound include widow, calico, vermillion, and halfbanded rockfish (*S. entomelas*, *S. dalli, S. miniatus, and S. semicinctus*, respectively). The sharpnose surfperch (*Phanerodon atripes*) is also commonly observed within

the deeper portion of Platform Grace. Love (2003) reported that two species, halfbanded rockfish and shiner surfperch (*Cymatogaster aggregatta*), accounted for 86.5 percent of the total fish observed on the shell mound at Platform Grace throughout the six-year study. Young of the year and juvenile boccaccio rockfish (*S. paucispinis*), a once depleted species that has subsequently recovered as a stock, were relatively abundant in the mid- and bottom-depth areas of Platform Grace during the 1999 and 2000 surveys (Love, et al., 2003). Fish species observed along the exposed shell mound habitat and transition areas to the soft sediment bottom include sanddabs (*Citharichtys* spp.), halfbanded rockfish, and other unidentified perch and juvenile rockfish (Crystal Energy, 2006).

2.2 PLATFORM GAIL

Habitats and seafloor sediments within the Project area at Platform Gail have also been characterized by several previous studies (Love et. al, 2000; Love et. al, 2003; MEC Analytical Systems, 2003). The seafloor around Platform Gail is also primarily sedimentary; however, the shell mounds beneath the Platform are lower relief and smaller area than around Platform Grace. MEC Analytical (2003) estimated that there are four identifiable shell mounds under Platform Gail which are approximately two to three feet tall, the largest of which measures 40 by 60 ft (12 to 18 m) at its base. The total volume of the four mounds under Platform Gail cannot be calculated accurately because the mounds are too small and difficult to identify with the multibeam survey equipment on a sloping sea floor but it is estimated to be less than 500 cubic yards.

Epibiota and fish species from the surface to mid-water depth are similar between Platform Gail and Grace; however, due to its considerable deeper bottom depth, Platform Gail hosts a different suite of species around its shell mounds and seafloor, including bocaccio, cowcod (*Sebastes levis*), another federally managed species experiencing a stock recovery, pinkrose (*S. simulator*), and greenblotched (*S. rosenblatti*) rockfishes. Love and Nishimoto (2012) reported that the assemblage of fish known to occupy the lower-relief shell mounds is composed of 1) juvenile fishes of larger species and juveniles and adults of dwarf species that utilize small sheltering sites (i.e., juvenile cowcod and lingcod [*Ophiodon elongatus*], blackeye goby (*Rhinogobiops nicholsii*), and calico rockfish [*S. dallii*]), 2) ecotonal species that favor soft sea floor-low, hard-relief bottom (greenstriped [*S. elongatus*] and stripetail [*S. saxicola*] rockfishes), and 3) a few schooling taxa (notably halfbanded rockfish) that are habitat generalists. Meyer-Gutbroad et al. (2019) reported that the average fish density at the submerged structure of Platform Gail between the surface and 114 ft (35 m) structure was 54 fish per 1,076 ft^2 (100 m^2).

2.3 ESSENTIAL FISH HABITAT

EFH is defined as "…those waters and substrate necessary for fish spawning, breeding, feeding, or growth to maturity." "Waters," as used in this definition, are defined to include "aquatic areas and their associated physical, chemical, and biological properties that are used by fish." These may include "…areas historically used by fish where appropriate; 'substrate' to include sediment, hard bottom, structures underlying the waters, and associated biological communities." "Necessary" means, "the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem." EFH is described as a subset of all habitats occupied by a species (NOAA, 1998). The Pacific Fishery Management Council (PFMC) is responsible for managing certain groundfish, coastal pelagic species, highly migratory species,

and salmon from 3 to 200 miles (5 to 322 kilometer) offshore of Washington, Oregon, and California. As amended in 1986, the Magnuson-Stevens Act requires PFMC to evaluate the effects of habitat loss or degradation on their fishery stocks and take actions to mitigate such damage.

The PFMC has designated areas of EFH for four fishery management groups, including Pacific coast groundfish, highly migratory species, coastal pelagic species and Pacific coast salmon. Based on habitat suitability modeling all marine waters less than 3,500 m in depth have been determine to be EFH for groundfish including the open waters within and around the project platforms.

The open-water domain or pelagic zone is the largest habitat on earth and home to about 40 percent of the fish species observed off California (BOEM, 2011). Several managed species known to occur in various life stages within the pelagic zone, may be present in the Project area (refer to Section 3 – Managed Species of Interest). Fish assemblages often overlap between the mesopelagic and bathypelagic zones, and offshore southern California, the common species that inhabit these zones include bent-tooth bristlemouth (family Gonostomatidae), California smooth-tongue (*Symphurus atricaudus*), Mexican lampfish (*Triphoturus mexicanus*), northern lampfish (*Stenobrachius leucopterus*), and showy bristlemouth (*Cyclothone* sp.) (Argonne National Laboratory, 2019).

Platforms are high-relief artificial structure similar to naturally occurring pinnacles that rise steeply from deep to shallow water. Pinnacles, which harbor high densities of juvenile fish, are uncommon along the California coast; therefore, platforms provide a surrogate habitat (Argonne National Laboratory, 2019). While offshore platforms are not designated EFH, surveys document that high concentrations of groundfish have been observed in association with these platforms, including recovering species such as formerly listed California Department of Fish and Wildlife (CDFW) species of special concern bocaccio (*Sebastes paucispinis*) and cowcod (*Sebates levis*) (Love, et al. 2003). NMFS and BOEM (2019) recognize that “oil and gas platforms may serve important EFH functions that enhance the survivorship of juvenile rockfishes”. In addition to providing suitable habitat, most of these platform jackets are not fished and act as de facto reserves.

For the purposes of this EFH, the offshore pelagic habitat within which the conductor removal activities will be conducted is of importance because it is habitat for the life stages of many fish species. Larvae, in particular, are seasonally abundant in surface layers shallower than 33 ft (10 m) where they feed on smaller phytoplankton and zooplankton.

2.4 HABITAT AREAS OF PARTICULAR CONCERN

EFH guidelines defines Habitat Areas of Particular Concern (HAPC) based on one or more of the following considerations:

- The importance of the ecological function provided by the habitat;
- The extent to which the habitat is sensitive to human-induced environmental degradation;

- Whether, and to what extent, development activities are or will be stressing the habitat type; and,
- The rarity of the habitat type.

Federal regulations recognize three HAPCs: Rock reefs, canopy kelps, and seagrass beds. . The following descriptions include an overview of these habitat types.

2.4.1 Rock Reefs

Rocky reef habitats can be categorized as either nearshore or offshore, in reference to the proximity of the habitat to the coastline. Rocky habitat may be composed of bedrock with varying degrees of vertical relief, boulders, or smaller rocks, such as cobble and gravel. Hard substrates are among the most important habitats for groundfish. The rocky reefs HAPC includes those waters, substrates, and other biogenic features associated with hard substrate up to the mean higher high-water mark.

Based on several geophysical surveys conducted between 2001 and 2006, the seafloor around both Platform Grace and Gail is sedimentary aside from the Platforms' respective shell mounds (MMS, 2001, 2003, and 2005; Crystal Energy, 2006). There are no known rocky reef habitats that would qualify as HAPC within the Project area that would be impacted by Project activities.

2.4.2 Canopy Kelps

Of the habitats associated with the rocky substrate on the continental shelf, kelp forests are of primary importance to the ecosystem and serve as important groundfish and epipelagic species nursery habitat. Kelp forest communities are found relatively close to shore along the open coast and are not found growing on offshore platforms. Due to the water depth and the lack of rock reef habitat in the photic zone, canopy kelps HAPC is not expected to occur within the Project area.

2.4.3 Seagrasses

Two important seagrass species found on the West Coast of the U.S. are eelgrass (*Zostera* spp.) and surfgrass. These grasses are vascular plants, not algae, forming dense beds of leafy shoots year-round in the lower intertidal and subtidal areas. Studies have shown seagrass beds to be among the areas of highest primary productivity in the world and both seagrass species are important for groundfish and pelagic species reproduction. Eelgrass is found on soft-bottom substrates in intertidal and shallow subtidal areas of estuaries and in some nearshore areas, such as the Channel Islands and Santa Barbara Channel. Surfgrass occurs on hard-bottom substrates along higher energy coastlines. Due to the water depths, distance from the coastline, and the lack of rock reef habitat, seagrass HAPC is not expected to occur within the Project area.

3.0 MANAGED SPECIES OF INTEREST

NMFS EFH online mapper was utilized to identify which management units are located within the offshore Project area (NMFS, 2020). Distribution and habitat information available in Miller and Lea (1972) and McCain (2005) was used to estimate which of the species listed in each management unit could occur in the Project area. Table 3.0-1 lists the managed species that could occur within the geographical region, water depth range, and habitat types found within the Project area.

Table 3.0-1. EFH Designated Species and Live Stages with the Potential to Occur in the Project Area

	Life Stages		
	Larvae/Neonates	**Juveniles**	**Adults**
Coastal Pelagic Species			
Northern anchovy (*Engraulis mordax*)	X	X	X
Pacific sardine (*Sardinops sagax*)	X	X	X
Pacific mackerel (*Scomber japonicus*)	X	X	X
Jack mackerel (*Trachurus symmetricus*)	X	X	X
Market squid (*Loligo opalescens*)	X	X	X
Pacific herring (*Clupea pallasii*)	X	X	X
Krill – *Euphausia pacifica*	X	X	X
Krill – *Thysanoessa spinifera*	X	X	X
Highly Migratory Species			
North Pacific albacore (*Thunnus alalunga*)		X	X
Yellowfin tuna (*Thunnus albacares*)		X	X
Bigeye tuna (*Thunnus obesus*)		X	X
Skipjack tuna (*Katsuwonus pelamis*)			X
Northern Bluefin (*Thunnus orientalis*)		X	X
Common thresher shark (*Alopias vulpinus*)	X	X	X
Pelagic thresher shark (*Alopias pelagicus*)	X	X	X
Bigeye thresher shark (*Alopias superciliosus*)		X	X
Shortfin mako (*Isurus oxyrhinchus*)	X	X	X
Blue shark (*Prionace glauca*)	X	X	X
Striped marlin (*Tetrapturus audax*)			X

Table 3.0-1. EFH Designated Species and Live Stages with the Potential to Occur in the Project Area

	Life Stages		
	Larvae/Neonates	**Juveniles**	**Adults**
Pacific swordfish (*Xiphias gladius*)		X	X
Dorado (*Coryphaena hippurus*)		X	X
Pacific Groundfish			
Arrowtooth flounder (*Atheresthes stomias*)	X	X	X
Butter sole (*Isopsetta isolepis*)	X	X	X
Curlfin sole (*Pleuronichthys decurrens*)	X	X	X
Dover sole (*Microstomus pacificus*)	X	X	X
English sole (*Parophrys vetulus*)	X	X	X
Flathead sole (*Hippoglossoides elassodon*)	X	X	X
Pacific sanddab (*Citharichthys sordidus*)	X	X	X
Petrale sole (*Eopsetta jordani*)	X	X	X
Rex sole (*Glyptocephalus zachirus*)	X	X	X
Rock sole (*Lepidopsetta bilineata*)	X	X	X
Sand sole (*Psettichthys melanostictus*)	X	X	X
Starry flounder (*Platichthys stellatus*)	X	X	X
Aurora Rockfish (*Sebastes aurora*)	X	X	X
Bank Rockfish (*Sebastes rufus*)	X	X	X
Black Rockfish (*Sebastes melanops*)	X	X	X
Blackgill Rockfish (*Sebates melanostomus*)	X	X	X
Blue Rockfish (*Sebates mystinus*)	X	X	X
Bocaccio (*Sebastes paucispinis*)	X	X	X
Brown Rockfish (*Sebates auriculatus*)	X	X	X
Calico Rockfish (*Sebates dalli*)	X	X	X
California Scorpionfish (*Scorpaena guttata*)	X	X	X
Canary Rockfish (*Sebates pinniger*)	X	X	X
Chilipepper (*Sebastes goodei*)	X	X	X
China Rockfish (*Sebastes nebulosus*)	X	X	X

Table 3.0-1. EFH Designated Species and Live Stages with the Potential to Occur in the Project Area

	Life Stages		
	Larvae/Neonates	**Juveniles**	**Adults**
Copper Rockfish (*Sebastes caurinus*)	X	X	X
Cowcod (*Sebates levis*)	X	X	X
Darkblotched Rockfish (*Sebastes carmeri*)	X	X	X
Flag Rockfish (*Sebastes rubrivinctus*)		X	X
Gopher Rockfish (*Sebastes carnatus*)	X	X	X
Greenblotched Rockfish (*Sebastes rosenblatti*)	X	X	X
Greenstriped Rockfish (*Sebastes elongates*)	X	X	X
Honeycomb Rockfish (*Sebastes umbrosus*)	X	X	X
Longspine Thorneyhead (*Sabastolobus altivelis*)	X	X	X
Mexican Rockfish (*Sebastes macdonaldi*)	X	X	X
Olive Rockfish (*Sebastes serranoides*)	X	X	X
Pacific Ocean Perch (*Sebastes alutus*)	X	X	X
Pink Rockfish (*Sebastes eos*)	X	X	X
Quillback Rockfish (*Sebastes maliger*)	X	X	X
Redbanded Rockfish (*Sebastes babcocki*)	X	X	X
Redstripe Rockfish (*Sebastes proriger*)	X	X	X
Rosethorn Rockfish (*Sebastes helvomaculatus*)	X	X	X
Rosy Rockfish (*Sebastes rosaceus*)	X	X	X
Rougheye Rockfish (*Sebastes aleutianus*)	X	X	X
Sharpchin Rockfish (*Sebastes zacentrus*)	X	X	X
Shortbelly Rockfish (*Sebastes jordani*)	X	X	X
Shortspined Thornyhead (*Sebastolobus alascanus*)	X	X	X
Speckled Rockfish (*Sebastes ovalis*)	X	X	X
Splitnose Rockfish (*Sebastes diploproa*)	X	X	X
Squarespot Rockfish (*Sebastes hopkinsi*)	X	X	X
Starry Rockfish (*Sebastes constellatus*)	X	X	X
Stripetail Rockfish (*Sebastes saxicola*)	X	X	X

Table 3.0-1. EFH Designated Species and Live Stages with the Potential to Occur in the Project Area

	Life Stages		
	Larvae/Neonates	**Juveniles**	**Adults**
Treefish (*Sebastes serriceps*)	X	X	X
Vermilion Rockfish (*Sebastes miniatus*)	X	X	X
Widow Rockfish (*Sebastes entomelas*)	X	X	X
Yelloweye Rockfish (*Sebastes ruberriums*)	X	X	X
Yellowtail Rockfish (*Sebastes flavidus*)	X	X	X
Lingcod (*Ophiodon elongates*)	X	X	X
Pacific Cod (*Gadus macrocephalus*)	X	X	X
Pacific Hake (Whiting) (*Merluccius productus*)	X	X	X
Pacific flatnose (*Antimora microlepis*)	X	X	X
Spotted Ratfish (*Hydrolagus colliei*)		X	X
Sable fish (*Anoplaopoma fimbria*)	X	X	
Pacific Grenadier (*Coryphaenoides acrolepis*)		X	X
Leopard shark (*Triakis semifasciata*)		X	X
Soupfin shark (*Galeorhinus galeus*)		X	X
Spiny dogfish (*Squalus acanthias*)		X	X
Big skate (*Raja binoculata*)		X	X
California skate (*Raja inornata*)		X	X
Longnose skate (*Raja rhina*)		X	X

Source: PFMC, 1998 and 2005

4.0 POTENTIAL IMPACTS

4.1 SEAFLOOR DISTURBANCE IMPACTS

The cutting and subsequent removal of conductors from each platform has the potential to create localized turbidity and affect nearby soft-bottomed seafloor habitat beneath the platform. These potential impacts include:

- The removal of marine growth prior to the conductor cutting;
- The increase in sediment suspension and potential subsurface discharge following cutting of the conductor with either abrasive or mechanical equipment; and
- The subsequent void and infill of the seafloor depression as the conductor is lifted from the seafloor.

Prior to removal, the external conductor surface will be cleaned of naturally occurring marine growth. As epibiota is detached from each conductor it will fall to the sea floor. For the duration of the Platforms' production operations, BSEE regulations required operations of offshore platforms to clear marine growth from shallow, submerged portions of the Platforms on a regular basis to reduce structure fatigue. The removed growth accumulated on the seafloor beneath the Platforms. The cleaning process is anticipated to result in some increased turbidity as these materials fall through the water column and again as it reaches the seafloor. The suspended materials will rapidly disperse once the clearing operation is completed. The resulting material added to the seafloor beneath the Platform is anticipated to contribute to benthic habitat that has been shown as a favored substrate for many juvenile rockfishes (Meyer-Gutbrod et al., 2019) and may contribute to a short-term increase in food availability within the water column.

During the final phase of conductor cutting operations, there is the potential for the subsurface (15 feet below the mudline) discharge of cutting fluid (i.e., seawater, abrasive materials, steel cuttings) that may cause a short-term disturbance of the sediment around the conductor. As the conductor is pulled towards the surface, there is also the potential for minor amounts of cutting fluid to drift out of the cut site. These discharges will occur intermittently throughout the duration of the Project (120 days at Platform Grace and 240 days at Platform Gail). Turbidity in the water column will increase as the conductor is pulled to the surface, however; due to the 15-foot-deep cutting depth, the majority of cutting fluid will be buried beneath the seafloor and disturbance is expected to be minimal.

Potential impacts could also occur as the conductors are pulled from the seafloor and expose the 15-foot-deep footprint of the cut conductor. As natural sediments move to fill the void, suspended sediments will create turbidity that would reduce water clarity and increase sediment deposition. This disturbance would also be extremely localized and short-term, as water conditions and seafloor topography would be expected to return to natural conditions following Project completion.

4.2 LOSS OF HABITAT STRUCTURE

Chevron will remove 38 conductors Platform Grace and 28 conductors from Platform Gail. Removal of the conductor pipes will reduce the surface area of artificial hard substrate by 26 percent for Platform Grace and 17 percent for Platform Gail. The reduction in surface area and

complexity has the potential to relocate the fish and invertebrate populations that utilize the area within the conductor footprint, to other areas within and around the platform structure.

The removal of the conductors would will result in a permanent decrease in available vertical structure and complexity of artificial habitat available within the water column. This reduction is only a small percentage of the existing habitat structure present within and surrounding the Platform jackets. Removal of the conductors would therefore not result in an adverse effect to regional populations of managed groundfish species.

4.3 NOISE IMPACTS FROM CONDUCTOR CUTTING

During conductor cutting there is the potential for an intermittent increase in underwater noise for approximately 120 days at Platform Grace and 240 days at Platform Gail with highest potential being at seafloor where the subsurface cutting noise may reverberate through the sedimentary substrate and the conductor string. Abrasive cutting techniques for the initial cut(s) are anticipated to take approximately seven hours per conductor. Mechanical cutting techniques are anticipated to take approximately 12 to 24 hours per conductor, depending on the number of internal strings of pipe that need to be cut. However, in comparison to the use of explosives, the use of the iron silicate abrasives cutting method and/or mechanical cutting methods within the conductors' interior, will significantly reduce the potential underwater noise levels associated with the cutting activities.

Although there are no studies that evaluate noise associated with the use of subsurface abrasive cutting or internal mechanical methods, previous conductor cutting projects have utilized the noise characteristics of diamond wire cutting in conductor removal operations as a surrogate for the anticipated underwater noise levels (BOEM, 2020, Pangerc et al. 2017). BOEM (2020) cited the diamond wire abrasive cutting has an in-water sound source level of 154 decibels (dB) re 1 microPascal (µPa) at one meter from the sound source. This study determined that the noise generated from diamond wire cutting are not easily discernible above the background noise (i.e., vessel and operations noise). Noise generated during Project conductor cutting will be dampened by the 15-feet of sediments above the cut; therefore, received sound levels are expected to be lower than those created during in-water abrasive diamond wire cutting.

As such, noise levels from internal conductor cutting are not expected to be of high enough energy to cause pathological or physiological in marine animals; however, there is the potential for temporary behavioral changes in the form of avoidance of the Project area. Behavioral effects include changes in the distribution, migration, and reproduction behaviors of exposed fish. Studies investigating the possible effects of sound on fish behavior have been conducted in higher noise energy environments on both uncaged and caged individuals (Chapman and Hawkins, 1969; Pearson et al., 1992; Santulli et al., 1999; Wardle et al., 2001; Hassel et al., 2003, in L-DEO, 2011). Studies have shown that typically, fish exhibited a sharp startle response at the onset of a sound followed by habituation and a return to normal behavior after the sound ceased.

Wardle et al. (2001) used video and telemetry to observe behavioral responses of marine fishes. The source discharges caused a startle response in the fish, but Wardle noted that there was no affect to their diurnal migrations or their distribution around the reef. There were also indications of responses to visual stimuli; if the acoustic source were visible to the fish, they would

swim away from it. However, if the source were out of the fish's line of sight, they would continue to swim towards the sound source.

Open water and submerged platform habitats will experience intermittent increases in noise levels during each conductor's respective cutting and removal (seven hours for iron silicate abrasives and 12 to 24 hours for mechanical cutting method); however, primary impacts will be to fish behavior which is expected to resume normal conditions after each conductor is cut. It is expected that fish will be displaced temporarily from deeper areas within the interior of the Platform structure; however, the conductor removal area is only a small part of the larger structure habitat and Project activities are not expected to affect the long-term fitness of local fish populations. Fish larva and egg phases are expected to experience mortality due to removal of settlement substrates on the surface of the conductors; however, mortality rates associated with the Project are considered low as compared against natural mortality rates, and would be difficult to completely quantify.

4.4 OIL SPILL EFFECTS

Prior to the Project, as part of the well plugging and abandonment operations, each well will have been plugged in accordance with BSEE regulations, eliminating the potential of the release of hydrocarbons from the wells.

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

When marine organisms are exposed to oil, exteriorly or interiorly, it adversely affects them physiologically. For example, physiological effects from oil spills on marine life could include the contamination of protective layers, loss of buoyancy, and loss of locomotive capabilities. Direct lethal toxicity or sub-lethal irritation and temporary alteration of the chemical make-up of the ecosystem can also occur. Oil spills have many variables to consider when dealing with the impact of the spill including oil type, season of occurrence, animal behavior, oceanographic and meteorological conditions, and the cleanup methods employed.

The effects of oil on fish have been well documented both in the field and within a laboratory. Research shows that fish that are unable to avoid hydrocarbons and take them up from food, sediments, and surrounding waters. Once these hydrocarbons are in the organism's tissues, they will affect the life span through a variety of behavioral, physiological, or biochemical changes. Also, exposure to oil will affect a species' ability to search, find, and capture food, which will affect its nutritional health. Early development life stages, such as larvae, will be especially impacted. Small amounts of oil can impact fish embryos by causing physical deformities, damage to genetic material, and mortality (Carls, et. al., 1999). Fishes experience the highest mortalities due to oil exposure when they are eggs or larvae. However, these deaths would not be significant

in terms of the overall population in offshore water. Brief encounters with oil by juvenile and adult fish species would not likely be fatal.

While a release of petroleum would be expected to have some short-term effect on the habitats and fish within the Project area, the likelihood of such an event occurring and the existing mitigations that have been built into the Project design reduce the possibility of such impacts occurring as a result of project related activities.

5.0 PROJECT MEASURES FOR EFH PROTECTION

The proposed well conductor cutting and removal program has been designed to minimize the potential for adverse impacts to the surrounding marine environment. The Project will implement the following measures to ensure the potential disturbance to EFH during Project operations is reduced to the extent feasible.

- Conductor cutting and removal activities will be conducted in accordance with BSEE Requirements (30 CFR Part 250.1710-1723) for decommissioning activities associated with the existing operational plans at Platforms Grace and Gail.
- As part of the well plug and abandonment program, the wellheads will have been removed and each well plugged in accordance with BSEE regulations prior to conductor cutting/removal activities.
- Conductor cutting and removal activities have been scheduled in one phase at each Platform to minimize Project timing and associated impacts.
- No anchoring has been proposed to minimize potential seafloor disturbance.
- Chevron has designed the Project to utilize internal conductor cutting methodologies to minimize potential noise impacts and potential discharges.
- Initial conductor cuts will be performed approximately 15 feet below mudline to minimize turbidity.
- Existing marine growth on the conductors will be cleared prior to conductor removal activities.
- Chevron will implement its existing agency-approved Oil Spill Contingency and Response Plans and Hazardous Materials Management Plans for both Platform Grace and Gail. These plans will be used to direct the containment and recovery of Project-related petroleum products in the event that they are accidentally released into the marine waters.
- Each Project vessel will have supporting spill kit equipment and will implement procedures specified in the spill plan to reduce the effects of accidentally discharged petroleum by facilitating rapid response and cleanup operations. The Project vessels will adhere to a zero-discharge policy.

6.0 CONCLUSION

Platforms Grace and Gail provide artificial vertical structure that is used by several EFH managed species. As described in Section 4.0 above, managed species in the area will experience temporary increases in water turbidity and noise levels, as well as a permanent incremental loss of artifical vertical structure as a result of conductor cutting and removal activities.

Temporary increases in water turbidity would primarily result from the removal of marine growth prior to conductor removal, potential discharge of cutting fluid during subsurface cutting of the conductor with either abrasive or mechanical equipment, and the infill of the seafloor depression as the conductor is lifted from the seafloor. The majority of cutting fluid is expected to stay either within the conductor or buried at the cut site. Seafloor disturbances would be localized and short-term, as water conditions and seafloor topography are expected to return to current conditions following Project completion.

During conductor cutting there is the potential for an intermittent increase in underwater noise for approximately 120 days at Platform Grace and 240 days at Platform Gail. The noise levels from internal conductor cutting are anticipated to be much less than that which would be expected utilizing explosive cutting techniques and are not expected to be of high enough energy to cause pathological or physiological effects in marine animals. However, there is the potential for temporary behavioral changes in the form of avoidance of the Project area. These impacts will be to fish behavior is expected to resume normal conditions after Project completion.

Fish displaced by the removal of the conductors are expected to find refuge and sufficient prey in the remaining Platform's structure and surrounding areas. Fish larva and egg phases have the potential to experience mortality due to removal of habitat; however, mortality rates associated with Project activities are low, as compared against natural mortality rates, and not expected to affect the long-term recruitment of fish stocks. Therefore, no EFH would be permanently altered by the proposed Project.

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