



PG&E
OCEAN BOTTOM SEISMOMETER
DEPLOYMENT PROJECT

OFFSHORE DIABLO CANYON, CALIFORNIA

PADRE/AQUEOS ROV OPERATIONS
FIELD OPERATIONS AND COMPLIANCE REPORT

Survey Period: December 4 - 10, 2013
Report Number: 23.00007046 D1

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I. SURVEY INFORMATION

1. DESCRIPTION OF THE WORK PERFORMED

INTRODUCTION: - As part of Pacific Gas & Electric Company's (PG&E) seismic safety assessment at the Diablo Canyon Power Plant (DCPP), an ocean bottom seismometer (OBS) system was installed in the nearshore waters off Pt. Buchon, San Luis Obispo County (Map 1). The system comprises four long-term OBS units, approximately 11.5 miles (mi) (18.5 kilometer [km]) of 2 inch (in.) (5 centimeter [cm]) diameter cable that provides power and transmitted data to a shorebased facility within DCPP, and two temporary OBS units. The temporary OBS units were installed for eight weeks and permanently removed in November 2013. The cable for the long-term OBS units enters the DCPP facility through a PVC conduit which extends into the marine waters of the DCPP intake embayment adjacent to the power plant. Installation of those units and cable was completed from July 20 through July 27. Final adjustments to the system were made between November 6 and November 24, 2013. PG&E accepted the fully-adjusted system on November 24, 2013.

Regulatory requirements specified that following installation (and completion of all adjustments) of the OBS system, a post-installation (as-laid) visual survey of the entire cable route and OBS locations was to be completed by a qualified contractor. Tenera Environmental (Tenera) was retained by PG&E to complete a diver survey of the nearshore segment from the PVC conduit to the 80 foot [ft.] [24 meter [m]] isobaths. Padre Associates, Inc. (Padre) was retained to complete the deeper water segments of the cable corridor, seaward of the 80 ft. [24 m] isobath.

SURVEY OPERATIONS: Padre and Aqueos contracted Fugro Pelagos (FPI) to provide surface and subsurface positioning services in support of ROV operations in the deeper water segments (as seen on Plate 1). Wide area DGPS integrated with Hypack navigational software was used to position the survey vessel in real time. Subsurface positioning was achieved using the TrackPoint II USBL positioning system integrated with the surface navigation system. During survey operations, ROV position fixes were logged for the seismometer locations and along the seismometer cable installed location.

2. WEATHER AND SEA STATE DURING OPERATIONS

Table 2-1 summarizes the weather and sea state during the survey operations

Date	Weather and Sea State
12/06/2013	Winds 5-10 Kt, Seas 3-4 Ft
12/07/2013	Winds 20-35 Kt, Seas 5-7 Ft
12/08/2013	Winds 5-10 Kt, Seas 3-4 Ft
12/09/2013	Winds 5-15 Kt, Seas 2-3 Ft

Table 2-1. Summary Weather Conditions

3. CHART OF SURVEY AREA

A chart showing the ROV survey as-laid cable survey is included at the end of this report

4. SPATIAL INFORMATION RELATED TO SURVEY TRACKLINES

Accompanying and made a part of this report are digital GIS Shapefiles depicting the as laid cable survey.

5. DATA COLLECTION DATES AND TIMES

On December 4, 2013, all equipment systems were mobilized onboard the *M/V Danny C* in Port Hueneme. Upon completion, the vessel travelled to Morro Bay. ROV operations commenced on December 6 and finished on December 9. All survey equipment was demobilized on December 10, 2013. The Table 5-1 summarizes the dates and times during which the actual data collection was performed.

Date	Start Time of Data Collection	End Time of Data Collection
12/06/2013	0920 PST	1527 PST
12/07/2013	On standby due to weather	
12/08/2013	0850 PST	1513 PST
12/09/2013	0809 PST	1055 PST

Table 5-1. Operation Summary Showing Date, Time of Data Collection

6. NATURE AND LOCATION OF ENVIRONMENTAL HAZARDS ECOUNTERED

No environmental hazards were encountered during the survey operations.

7. ACCIDENT, INJURY, DAMAGE TO OR LOSS OF PROPERTY

No accidents or injuries occurred during the duration of the project, and no damages or loss of property was reported.

8. OTHER INFORMATION RELATIVE TO THE PERMITTED ACTIVITIES

No other information related to the permitted activites are reported.

II. BIOLOGICAL INFORMATION

California State Lands Commission "Survey Permit PRC 8392 General Permit to Conduct Geophysical Surveys" states in Section 7, Paragraph h, item ii. "MWMs will not be required aboard vessels conducting survey activities that utilize, as the only form of geophysical equipment, non-pulse or non-acoustic generating passive survey equipment (e.g. ROV, magnetometers, gravity meters. Therefore no MWMs were present onboard the vessel and information provided in this section are from observations by the vessel and ROV survey crews.

1. ENCOUNTERS WITH WITH MARINE WILDLIFE

The captain of the vessel and all personnel aboard were instructed to visually monitor the area around the vessel for approaches by marine wildlife. No encounters with marine wildlife were reported during the ROV visual inspections.

2. SHUT-DOWNS AND SLOW DOWNS

During ROV video operations, no shut-downs or slow downs were required related to proximity of marine wildlife.

3. OBSERVATIONS OF PINNIPED BEHAVIOR

The ship and ROV survey crews were instructed to report any visual observations of Pinnipeds exhibiting unusual behavior. During the ROV video surveys no unusual Pinniped behavior was observed or reported.

4. COLLISION EVENTS

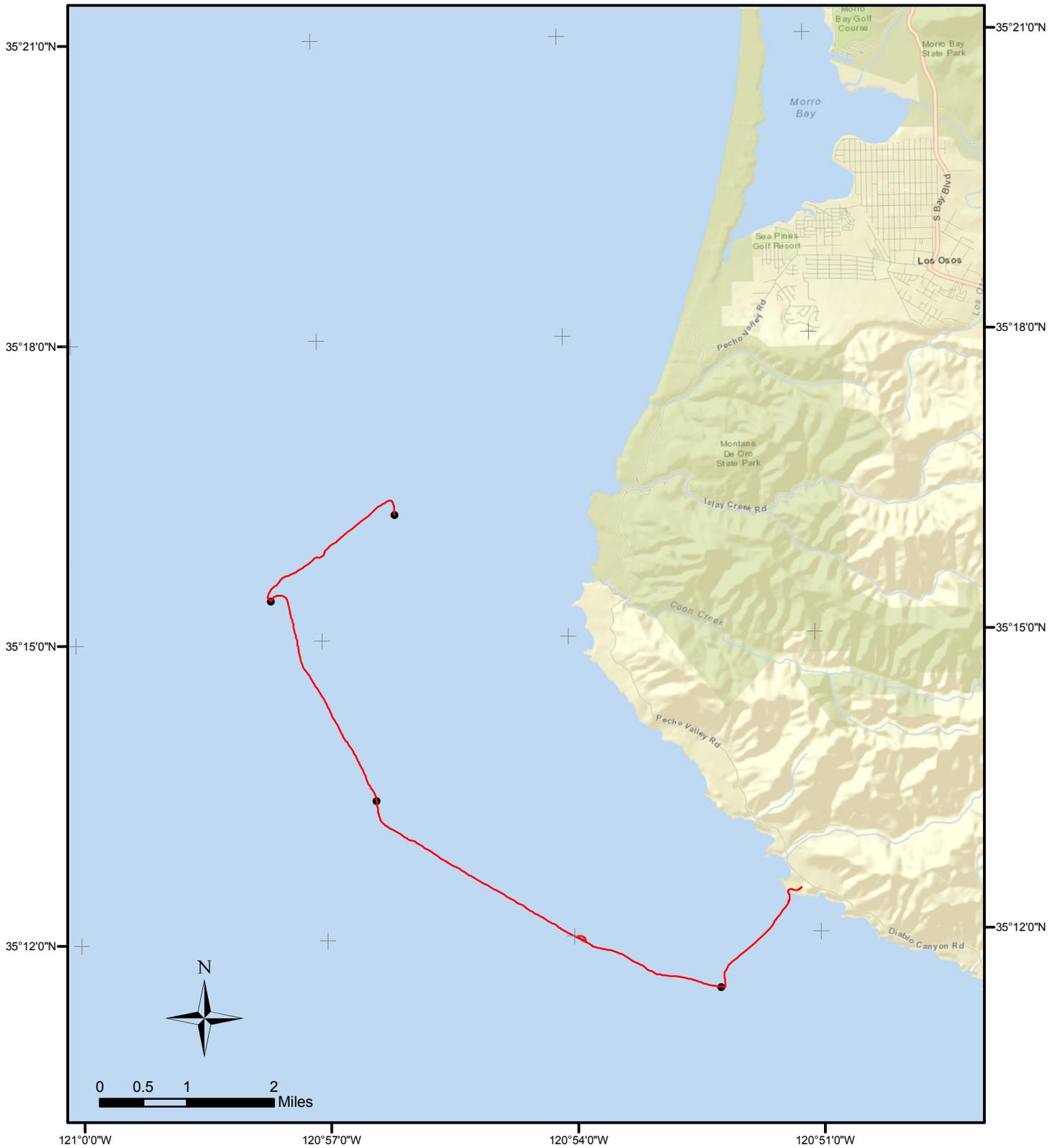
There were no collision events during the ROV video survey operations.

5. EXHIBIT H – MITIGATION MONITORING PROGRAM

Exhibit H is included as an attachment to this report.

6. MWM MONITORING REPORT

Based on the cooperative efforts of the Project team and vessel crew, no negative Project activity or transit-related effects to the marine environment were observed during Project activities. The project activities were in compliance with the mitigation measures outlined in Exhibit H of CSLC issued geophysical permit and all mitigation measures were implemented. The mitigation measures were effective in preventing or minimizing the environmental impacts from the PG&E OBS Project ROV Survey.



ROV SURVEY LOCATION
OCEAN BOTTOM SEISMOMETERS AND CABLE AS LAID

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
Air Quality and Greenhouse Gas (GHG) Emissions (MND Section 3.3.3)						
MM AIR-1: Engine Tuning, Certification, and Fuels. The following measures will be required to be implemented by all Permittees under the Offshore Geophysical Permit Program (OGPP), as applicable depending on the county offshore which a survey is being conducted	<p>All Counties: Maintain all construction equipment in proper tune according to manufacturers' specifications; fuel all off-road and portable diesel-powered equipment with California Air Resources Board (CARB)-certified motor vehicle diesel fuel limiting sulfur content to 15 parts per million or less (CARB Diesel).</p> <p>Los Angeles and Orange Counties: Use vessel engines meeting CARB's Tier 2-certified engines or cleaner; the survey shall be operated such that daily NO_x emissions do not exceed 100 pounds based on engine certification emission factors. This can be accomplished with Tier 2 engines if daily fuel use is 585 gallons or less, and with Tier 3 engines if daily fuel use is 935 gallons or less.</p> <p>San Luis Obispo County: Use vessel engines meeting CARB's Tier 2-certified engines or cleaner, accomplished with Tier 2 engines if daily fuel use is 585 gallons or less; all diesel equipment shall not idle for more than 5 minutes; engine use needed to maintain position in the water is not considered idling; diesel idling within 300 meters (1,000 feet) of sensitive receptors is not permitted; use alternatively fueled construction equipment on site where feasible, such as compressed natural gas, liquefied natural gas, propane or biodiesel.</p> <p>Santa Barbara County: Use vessel engines meeting CARB's Tier 2-certified engines or cleaner, accomplished with Tier 2 engines if daily fuel use is 790 gallons or less;</p> <p>Ventura County: Use alternatively fueled construction equipment on site where feasible, such as compressed natural gas, liquefied natural gas, propane or biodiesel.</p>	Daily emissions of criteria pollutants during survey activities are minimized.	<p>Determine engine certification of vessel engines.</p> <p>Review engine emissions data to assess compliance, determine if changes in turning or fuel are required.</p> <p>Verify that Tier-2 or cleaner engines are being used.</p> <p>Calculate daily NO_x emissions to verify compliance with limitations.</p> <p>Verify that Tier-2 or cleaner engines are being used.</p> <p>Inform vessel operator(s) of idling limitation.</p> <p>Investigate availability of alternative fuels.</p> <p>Verify that Tier-2 or cleaner engines are being used.</p> <p>Investigate availability of alternative fuels.</p> <p>Investigate availability of alternative fuels.</p>	OGPP permit holder and contract vessel operator; California State Lands Commission (CSLC) review of Final Monitoring Report.	Prior to, during, and after survey activities. Submit Final Monitoring Report after completion of survey activities.	<p>11-4-13</p> <p>BS</p>

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials												
<p>MM BIO-1: Marine Mammal and Sea Turtle Presence -- Current Information.</p>	<p>All State waters; prior to commencement of survey operations, the geophysical operator shall (1) contact the National Oceanic and Atmospheric Administration Long Beach office staff and local whale-watching operations and shall acquire information on the current composition and relative abundance of marine wildlife offshore, and (2) convey sightings data to the vessel operator and crew, survey party chief, and onboard Marine Wildlife Monitors (MWMs) prior to departure. This information will aid the MWMs by providing data on the approximate number and types of organisms that may be in the area.</p>	<p>No adverse effects to marine mammals or sea turtles due to survey activities are observed.</p>	<p>Document contact with appropriate sources. Submit Final Monitoring Report after completion of survey activities.</p>	<p>OGPP permit holder; Inquiry to NOAA and local whale watching operators.</p>	<p>Prior to survey.</p>	<p>12-4-13 PJS</p>												
<p>MM BIO-2: Marine Wildlife Monitors.</p>	<p>A minimum of two qualified MWMs who are experienced in marine wildlife observations shall be onboard the survey vessel throughout both transit and data collection activities. The specific monitoring, observation, and data collection responsibilities shall be identified in the Marine Wildlife Contingency Plan required as part of all Offshore Geophysical Permit Program permits. Qualifications of proposed MWMs shall be submitted to the National Oceanic and Atmospheric Administration (NOAA) and CSLC at least two weeks in advance of the survey for their approval by the agencies. Survey operations shall not commence until the CSLC approves the MWMs.</p>	<p>Competent and professional monitoring or marine mammals and sea turtles; compliance with established monitoring policies.</p>	<p>Document contact with and approval by appropriate agencies. Submit Final Monitoring Report after completion of survey activities.</p>	<p>OGPP permit holder.</p>	<p>Prior to survey.</p>	<p>N/A</p>												
<p>MM BIO-3: Safety Zone Monitoring.</p>	<p>Onboard MWMs responsible for observations during vessel transit shall be responsible for monitoring during the survey equipment operations. All visual monitoring shall occur from the highest practical vantage point aboard the survey vessel; binoculars shall be used to observe the surrounding area, as appropriate. The MWMs will survey an area (i.e., safety or exclusion zone) based on the equipment used, centered on the sound source (i.e., vessel, towfish), throughout time that the survey equipment is operating. Safety zone radial distances, by equipment type, include:</p> <table border="1"> <thead> <tr> <th>Equipment Type</th> <th>Safety Zone (radius, m)</th> </tr> </thead> <tbody> <tr> <td>Single Beam Echosounder</td> <td>50</td> </tr> <tr> <td>Multibeam Echosounder</td> <td>500</td> </tr> <tr> <td>Side-Scan Sonar</td> <td>600</td> </tr> <tr> <td>Subbottom Profiler</td> <td>100</td> </tr> <tr> <td>Boomer System</td> <td>100</td> </tr> </tbody> </table>	Equipment Type	Safety Zone (radius, m)	Single Beam Echosounder	50	Multibeam Echosounder	500	Side-Scan Sonar	600	Subbottom Profiler	100	Boomer System	100	<p>No adverse effects to marine mammals or sea turtles due to survey activities are observed; compliance with established safety zones.</p>	<p>Compliance with permit requirements (observers); compliance with established safety zones. Submit Final Monitoring Report after completion of survey activities.</p>	<p>OGPP permit holder.</p>	<p>Prior to survey.</p>	<p>N/A</p>
Equipment Type	Safety Zone (radius, m)																	
Single Beam Echosounder	50																	
Multibeam Echosounder	500																	
Side-Scan Sonar	600																	
Subbottom Profiler	100																	
Boomer System	100																	

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Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
<p>MM BIO-4: Limits on Nighttime OGPP Surveys.</p>	<p>The onboard MWMMs shall have authority to stop operations if a mammal or turtle is observed within the specified safety zone and may be negatively affected by survey activities. The MWMMs shall also have authority to recommend continuation (or cessation) of operations during periods of limited visibility (i.e., fog, rain) based on the observed abundance of marine wildlife. Periodic reevaluation of weather conditions and reassessment of the continuation/cessation recommendation shall be completed by the onboard MWMMs. During operations, if an animal's actions are observed to be irregular, the monitor shall have authority to recommend that equipment be shut down until the animal moves further away from the sound source. If irregular behavior is observed, the equipment shall be shut-off and will be restarted and ramped-up to full power, as applicable, or will not be started until the animal(s) is/are outside of the safety zone or have not been observed for 15 minutes.</p> <p>For nearshore survey operations utilizing vessels that lack the personnel capacity to hold two MWMMs aboard during survey operations, at least twenty-one (21) days prior to the commencement of survey activities, the Permittee may petition the CSLC to conduct survey operations with one MWMM aboard. The CSLC will consider such authorization on a case-by-case basis and factors the CSLC will consider will include the timing, type, and location of the survey, the size of the vessel, and the availability of alternate vessels for conducting the proposed survey. CSLC authorizations under this subsection will be limited to individual surveys and under any such authorization, the Permittee shall update the MWCP to reflect how survey operations will occur under the authorization.</p>	<p>No adverse effects to marine mammals or sea turtles due to survey activities are observed.</p>	<p>Pre-survey request for nighttime operations, including equipment specifications and proposed use schedule.</p> <p>Document equipment</p>	<p>OGPP permit holder.</p>	<p>Approval required before survey is initiated. Monitoring Report following</p>	<p>AWA</p>

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
<p>MM BIO-5: Soft Start.</p>	<p>All State waters; the survey operator shall use a "soft-start" technique at the beginning of survey activities each day (or following a shut down) to allow any marine mammal that may be in the immediate area to leave before the sound sources reach full energy. Surveys shall not commence at nighttime or when the safety zone cannot be effectively monitored. Operators shall initiate each piece of equipment at the lowest practical sound level, increasing output in such a manner as to increase in steps not exceeding approximately 6 decibels (dB) per 5-minute period. During ramp-up, the marine wildlife monitors shall monitor the safety zone. If marine mammals are sighted within or about to enter the safety zone, a power-down or shut-down shall be implemented as though the equipment was operating at full power. Initiation of ramp-up procedures from shut-down requires that the marine wildlife monitors be able to visually observe the full safety zone.</p>	<p>No adverse effects to marine mammals or sea turtles due to survey activities are observed.</p>	<p>Submit Final Monitoring Report after completion of survey activities. Compliance with permit requirements (observers); compliance with safe start procedures. Submit Final Monitoring Report after completion of survey activities.</p>	<p>OGPP permit holder.</p>	<p>Immediately prior to survey.</p>	<p><i>NA</i></p>
<p>MM BIO-6: Practical Limitations on Equipment Use and Adherence to Equipment Manufacturer's Routine Maintenance Schedule.</p>	<p>All State waters; geophysical operators shall follow, to the maximum extent possible, the guidelines of Zykov (2013) as they pertain to the use of subbottom profilers and side-scan sonar, including:</p> <ul style="list-style-type: none"> Using the highest frequency band possible for the subbottom profiler; Using the shortest possible pulse length; and Lowering the pulse rate (pings per second) as much as feasible. <p>Geophysical operators shall consider the potential applicability of these measures to other equipment types (e.g., boomer). Permit holders will conduct routine inspection and maintenance of acoustic-generating equipment to ensure that low energy geophysical equipment used during permitted survey activities remains in proper working order and within manufacturer's equipment specifications. Verification of the date and occurrence of such equipment</p>	<p>No adverse effects to marine mammals or sea turtles due to survey activities are observed.</p>	<p>Document initial and equipment settings during survey. Submit Final Monitoring Report after completion of survey activities.</p>	<p>OGPP permit holder.</p>	<p>Immediately prior to and during survey.</p>	<p><i>NA</i></p>

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
MM BIO-7: Avoidance of Pinniped Haul-Out Sites.	<p>inspection and maintenance shall be provided in the required presurvey notification to CSLC.</p> <p>The Marine Wildlife Contingency Plan (MWCP) developed and implemented for each survey shall include identification of haul-out sites within or immediately adjacent to the proposed survey area. For surveys within 300 meters (m) of a haul-out site, the MWCP shall further require that:</p> <ul style="list-style-type: none"> The (survey) vessel shall not approach within 91 m of a haul-out site, consistent with National Marine Fisheries Service (NMFS) guidelines; Survey activity close to haul-out sites shall be conducted in an expedited manner to minimize the potential for disturbance of pinnipeds on land; and Marine wildlife observers shall monitor pinniped activity onshore as the vessel approaches, observing and reporting on the number of pinnipeds potentially disturbed (e.g., via head lifting, flushing into the water). <p>The purpose of such reporting is to provide CSLC and California Department of Fish and Wildlife (CDFW) with information regarding potential disturbance associated with OGPP surveys.</p>	No adverse effects to pinnipeds at haul outs are observed.	Document pinniped reactions to vessel presence and equipment use. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Monitoring Report following completion of survey.	11-1-13 [Signature]
MM BIO-8: Reporting Requirements - Collision.	<p>All State waters; if a collision with marine mammal or reptile occurs, the vessel operator shall document the conditions under which the accident occurred, including the following:</p> <ul style="list-style-type: none"> Vessel location (latitude, longitude) when the collision occurred; Date and time of collision; Speed and heading of the vessel at the time of collision; Observation conditions (e.g., wind speed and direction, swell height, visibility in miles or kilometers, and presence of rain or fog) at the time of collision; Species of marine wildlife contacted (if known); Whether an observer was monitoring marine wildlife at the time of collision; and, Name of vessel, vessel owner/operator, and captain officer in charge of the vessel at time of collision. <p>After a collision, the vessel shall stop, if safe to do so; however, the vessel is not obligated to stand by and may proceed after confirming that it will not further damage the animal by doing so. The vessel will then immediately communicate by radio or telephone all details to the</p>	No adverse effects to marine mammals or sea turtles due to survey activities are observed.	Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Monitoring Report following completion of survey.	[Signature]

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Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
<p>MM BIO-9: Limitations on Survey Operations in Select Marine Protected Areas (MPAs).</p>	<p>vessels base of operations, and shall immediately report the incident. Consistent with Marine Mammal Protection Act requirements, the vessel's base of operations or, if an onboard telephone is available, the vessel captain him/herself, will then immediately call the NOAA Stranding Coordinator to report the collision and follow any subsequent instructions. From the report, the Stranding Coordinator will coordinate subsequent action, including enlisting the aid of marine mammal rescue organizations, if appropriate. From the vessel's base of operations, a telephone call will be placed to the Stranding Coordinator, NOAA NMFS, Southwest Region, Long Beach, to obtain instructions. Although NOAA has primary responsibility for marine mammals in both State and Federal waters, The California Department of Fish and Wildlife will also be advised that an incident has occurred in State waters affecting a protected species.</p>	<p>No adverse effects to MPA resources due to survey activities are observed.</p>	<p>Monitor reactions of wildlife to survey operations; report on shutdown conditions and survey restart. Submit Final Monitoring Report after completion of survey activities.</p>	<p>OGPP permit holder; survey permitted by CDFW.</p>	<p>Prior to survey.</p>	<p>MAA</p>

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
MM HAZ-1: Oil Spill Contingency Plan (OSCP) Required Information.	Permittees shall develop and submit to CSLC staff for review and approval an OSCP that addresses accidental releases of petroleum and/or non-petroleum products during survey operations. Permittees' OSCPs shall include the following information for each vessel to be involved with the survey: <ul style="list-style-type: none"> • Specific steps to be taken in the event of a spill, including notification names, phone numbers, and locations of: (1) nearby emergency medical facilities, and (2) wildlife rescue/response organizations (e.g., Oiled Wildlife Care Network); • Description of crew training and equipment testing procedures; and • Description, quantities and location of spill response equipment onboard the vessel. 	Reduction in the potential for an accidental spill. Proper and timely response and notification of responsible parties in the event of a spill.	Documentation of proper spill training. Notification of responsible parties in the event of a spill.	OGPP permit holder and contract vessel operator.	Prior to survey.	10/25/13 [Signature] Via Email
MM HAZ-2: Vessel fueling restrictions.	Vessel fueling shall only occur at an approved docking facility. No cross vessel fueling shall be allowed.	Reduction in the potential for an accidental spill.	Documentation of fueling activities.	Contract vessel operator.	Following survey.	N/A
MM HAZ-3: OSCP equipment and supplies.	Onboard spill response equipment and supplies shall be sufficient to contain and recover the worst-case scenario spill of petroleum products as outlined in the OSCP.	Proper and timely response in the event of a spill.	Notification to CSLC of onboard spill response equipment/supplies inventory, verify ability to respond to worst-case spill.	Contract vessel operator.	Prior to survey.	10/25/13 [Signature]

EXHIBIT H

Mitigation Monitoring Program

Mitigation Measure (MM)	Location and Scope of Mitigation	Effectiveness Criteria	Monitoring or Reporting Action	Responsible Party	Timing	Implementation Date(s) and Initials
MM HAZ-1: Oil Spill Contingency Plan (OSCP) Required Information.	Outlined under Hazards and Hazardous Materials (above)					10/25/13 BJS
MM HAZ-2: Vessel fueling restrictions.	Outlined under Hazards and Hazardous Materials (above)					
MM HAZ-3: OSCP equipment and supplies.	Outlined under Hazards and Hazardous Materials (above)					
MM BIO-9: Limitations on Survey Operations in Select MPAs.	Outlined under Biological Resources (above)					
MM REC-1: U.S. Coast Guard (USCG), Harbormaster, and Dive Shop Operator Notification.	All California waters where recreational diving may occur; as a survey permit condition, the SCLC shall require Permittees to provide the USCG with survey details, including information on vessel types, survey locations, times, contact information, and other details of activities that may pose a hazard to divers so that USCG can include the information in the Local Notice to Mariners, advising vessels to avoid potential hazards near survey areas. Furthermore, at least 21 days in advance of in-water activities, Permittees shall: (1) post such notices in the harbormasters' offices of regional harbors; and (2) notify operators of dive shops in coastal locations adjacent to the proposed offshore survey operations.	No adverse effects to recreational divers from survey operations.	Notify the USCG, local harbor-masters, and local dive shops of planned survey activity. Submit Final Monitoring Report after completion of survey activities.	OGPP permit holder.	Prior to survey.	10/25/13 BJS via email, FAX, & Neg. mail