

CALIFORNIA COASTAL COMMISSION

45 FREMONT, SUITE 2000
SAN FRANCISCO, CA 94105-2219
VOICE AND TDD (415) 904-5200
FAX (415) 904-5400



RECORD PACKET COPY

Th6b

Date Filed:	August 9, 2005
49 th Day:	September 27, 2005
Staff:	SMR-SF
Staff Report:	August 30, 2005
Hearing Date:	September 15, 2005

**STAFF REPORT:
COASTAL DEVELOPMENT PERMIT APPLICATION
& CONSISTENCY CERTIFICATION**

CDP Application No.:	E-05-007
Consistency Certification No.:	CC-076-05
Project Applicant:	Monterey Bay Aquarium Research Institute (MBARI)
Location:	State and federal waters offshore of Moss Landing, California, within the Monterey Bay National Marine Sanctuary (Exhibit 1).
Project Description:	The project includes (a) installing and operating a 31.7-mile long submarine research fiber optic cable that will extend from a shore station in Moss Landing to a formation known as the Smooth Ridge in Monterey Bay, and (b) placement of a scientific node containing eight ports at the seaward end of the cable, approximately 2,923 feet below the ocean surface.
Substantive File Documents:	See Appendix A.

SYNOPSIS

The Monterey Bay Aquarium Research Institute (hereinafter, "MBARI") proposes to install and operate a 31.7-mile long marine research fiber optic cable offshore of Moss Landing and within the Monterey Bay National Marine Sanctuary. At the seaward end of the cable, on an area of the seabed called Smooth Ridge, MBARI also proposes to place a science node (a piece of equipment that measures approximately 15 feet long, 12 feet wide, and 4 feet high) that contains eight data ports to provide electrical power and data transfer capability (Exhibit 2). The purpose of the cable is to support Monterey Bay oceanographic research.

MBARI proposes to bury the cable to a depth of 3.3 feet (1 m), where feasible, within State and federal waters from the mean high tide line to approximately 31.7 miles offshore at a water depth of approximately 2,923 feet. MBARI estimates that about 76 percent of the total length of cable can be buried. In areas where a 1-meter burial depth is not achievable, the cable would be buried to the greatest depth possible. Some portions of the cable would remain unburied due to hard seafloor substrate and exposed rocks.

The portion of the project that lies within the Coastal Commission's retained permit jurisdiction, and which is the subject of coastal development permit ("CDP") application E-05-007, extends seaward from the mean high tide line to 3 miles offshore. From an onshore station in Moss Landing to 0.89 mile offshore, the cable will be installed under the seafloor using Horizontal Directional Drilling ("HDD"). From 0.89 mile to 31.7 miles offshore, the cable will be installed with a hydraulic plow and buried to a target depth of 1 meter, where feasible.

The project also requires a federal permit from the U.S. Army Corps of Engineers ("ACOE") and therefore requires a consistency certification pursuant to Section 307(c)(3)(A) of the Coastal Zone Management Act. For the portion of the project that lies in State waters, the consistency certification is redundant; the CDP serves as a consistency certification. On June 30, 2005, MBARI submitted a consistency certification to the Coastal Commission certifying that the proposed activities comply with the California Coastal Management Program ("CCMP") and will be conducted in a manner consistent with the CCMP. This staff report is a combined CDP and consistency certification.

Major Coastal Act issues associated with this project include potential impacts to marine resources and commercial fishing. Please see Table 1 for a summary of potential impacts, mitigation measures, and Commission staff recommended conditions of CDP approval. The Commission staff recommends approval of CDP application E-05-007, as conditioned.

The Commission staff also recommends that the Commission concur in CC-076-05.

Table 1. Major Issue Summary: Potential Impacts, Mitigation Measures and Permit Conditions

Significant Issue Area	Proposed Special Conditions and Mitigation Measures
Marine Resources: Marine Mammals	<p>Issue: Marine mammals may become entangled with the cable during feeding activities if the cable is insufficiently buried or exposed on the seafloor. Marine mammals or sea turtles may collide with vessels and be injured or killed.</p> <p>Special Conditions:</p> <p>Special Condition 4 requires the cable to be buried to a depth of 1.0 meter in state waters and in federal waters, except where precluded by seafloor substrates. Where a 1.0-meter burial depth cannot be achieved, MBARI shall bury the cable to the maximum depth feasible.</p> <p>Special Condition 5 requires that within 90 days of cable installation, MBARI shall submit to the Executive Director: (a) an as-built plan in writing (Route Position List) and on alignment or strip charts depicting bathymetry, seafloor substrates or features, seabed profile, depth of cable burial below the seafloor, and cable tension; (b) an electronic as-built plan; and (c) the as-built cable plans overlaid on National Oceanic and Atmosphere Administration ("NOAA") navigation charts.</p> <p>Special Condition 6 requires that within 90 days of cable installation, MBARI shall submit to the Executive Director: (a) an operations report describing any cable post-installation activities, including routine or non-routine post-lay surveys, repair activities, and cable inspection activities; and (b) a cable installation report containing, at minimum, the following: (i) a summary of pre-lay and installation operations; (ii) an as-laid position list with definitions for acronyms, time reference and locations of course alterations, repeaters and splice boxes. The information shall include: date, time, event, latitude, longitude, depth, incremental route distance, and any route deviations; (iii) a description of cable laying and burial equipment, and cable installation methods used; (iv) navigational and slack control equipment and methods; (v) identification of any areas of cable suspension greater than 1.0 meter from the seafloor; (vi) daily vessel reports and daily operations log; (vii) any additional acoustic, sub-bottom profile or other geophysical data generated that had not been previously submitted to the Executive Director; (viii) an evaluation of the consistency of cable installation with the project description and applicable special conditions of this permit; and (ix) a description of fishing activity during the pre-lay and cable installation project phases. MBARI has agreed to the same requirement for its cable located in federal waters.</p> <p>Special Condition 7 requires that every 18 to 24 months, MBARI shall survey the cable route to verify that buried cable has remained buried consistent with the as-built plan required by Special Condition 5. MBARI shall complete the first survey of the cable within 18-24 months of initial cable installation. The second survey shall be completed within 18-24 months of completion of the first survey. If, based on the results of the first two surveys, there is no evidence of cable movement (i.e., buried cable remains stable), MBARI may request in the form of a permit amendment application a reduction in subsequent survey intervals.</p>

Significant Issue Area	Proposed Special Conditions and Mitigation Measures
Marine Resources: Marine Mammals (continued)	<p>Surveys shall be conducted with a remotely operated vehicle ("ROV") equipped with video and by a party approved by the Executive Director. Within 30 days of survey completion, MBARI shall submit to the Executive Director a report describing the results of the survey (including example still images) and a copy of the videotape(s) recorded during the cable survey. The videotape(s) shall include a display that identifies the date, time, position, water depth, and heading of the ROV.</p> <p>MBARI prepared a Marine Mammal Monitoring Plan that includes, among other provisions, a 500-foot safety zone, and a commitment to undertake marine mammal monitoring. Special Condition 10 requires implementation of the Marine Mammal Monitoring Plan. The Executive Director must approve all marine mammal monitors.</p> <p>Special Condition 12 requires that within 30 days of the last day of all marine operations that require marine wildlife monitors onboard a vessel(s) pursuant to Special Condition 10, MBARI shall submit to the Executive Director and NOAA Fisheries a marine wildlife monitoring report prepared by the approved marine wildlife monitors. The report shall include: (a) an evaluation of the effectiveness of monitoring protocols and (b) reporting of (i) marine mammal, sea turtle, and other wildlife sightings (species and numbers); (ii) any wildlife behavioral changes that may have been attributable to project operations; and (iii) any project delays or cessation of operations due to the presence in the project area of marine wildlife species subject to protection under the Marine Mammal Monitoring Plan.</p> <p>Special Condition 13 requires that in order to address portions of the route where cable burial is infeasible due to seafloor substrates, MBARI shall incorporate "best available technology," so that the cable will conform as close as technically possible to the contours of the seafloor. "Best available technology" shall include but not be limited to the use, where appropriate, of cable slack control. Before commencement of cable installation, MBARI shall use an autonomous underwater vehicle ("AUV") with multi-beam sonar to map the route. Based on the results of the AUV survey, MBARI shall route the cable to avoid, if feasible, all high relief (i.e., \geq 1-meter high) hard substrate.</p> <p>In the event that fishers snag the cable and lose or cut gear, or that any other type of entanglement occurs (e.g., whale), MBARI is required in Special Condition 17 to use all feasible measures to retrieve the fishing gear or object. MBARI shall notify the Executive Director within 48 hours of MBARI's knowledge of gear loss or other cable entanglement. Retrieval shall occur no later than six weeks after discovering or receiving notice of the incident, unless otherwise authorized by the Executive Director. If full removal of gear is not feasible, MBARI shall remove as much gear as practicable to minimize harm to wildlife (e.g. fishes, birds, and marine mammals). Within two weeks of completing the recovery operation, MBARI shall submit to the Executive Director a report describing (a) the nature of and location of the entanglement (with a map) and (b) the retrieval method used for removing the entangled gear or object, or the method used for minimizing harm to wildlife if gear retrieval proves infeasible.</p>

Significant Issue Area	Proposed Special Conditions and Mitigation Measures
Marine Resources: Marine Mammals (continued)	<p>Special Condition 20 requires that within 90 days of either taking a cable out of service or after the expiration or sooner termination of MBARI's lease or permit, MBARI is to apply for an amendment to this permit to remove the cable from State waters. MBARI has also agreed to remove cable located in federal waters.</p> <p>Issue: A hydraulic plow generates underwater sound levels up to 185 dB. Marine mammals at or near the project site could be harmed by project-related underwater sound.</p> <p>Special Conditions: MBARI estimates that at 100 feet from the sound source (hydraulic plow), sound will attenuate to 160 dB. It proposes to establish a 500-foot marine mammal safety zone. Within that safety zone, two marine mammal monitors will be stationed on a vessel at all times to monitor the presence of marine mammals. The monitors have authority to stop all work until there is no longer a threat to an animal transiting the area. Special Condition 11 requires that prior to issuance of this permit MBARI submit for Executive Director review and approval a plan to verify in the field (through placement of an array of hydrophones) either prior to or on the first day of cable laying operations the 500-foot marine mammal safety zone. MBARI shall adjust the safety zone outward, if necessary, if the distance to a received sound level of 160dB is greater than 500 feet.</p>
Marine Resources: Hard Bottom	<p>Issue: Because sensitive, rare, and slow-growing epifaunal species reside on rocky substrates, cable laying activities may disturb or destroy them. Cable laying activities in federal waters will also affect about 890 square meters of hard substrate.</p> <p>Mitigation Measures: In the past, an applicant has mitigated or compensated for unavoidable hard bottom habitat impacts by paying a mitigation fee into a California Department of Fish and Game ("CDFG") Hard Bottom Mitigation Fund. The pooled funds are then used to build new artificial reefs or augment existing ones. However, that mitigation fund is now closed and therefore not available to MBARI. To offset its hard substrate impacts, MBARI proposes instead to (a) use side scan and multi-beam sonar to image a section of the Sanctuary's seafloor with the goal of identifying derelict fishing gear, and (b) provide that data to agencies and others who can then use it to remove the debris that is causing human, wildlife and habitat adverse impacts. The survey will occur within an area approximately 7 square kilometers (in waters depths of around 30 meters) slightly more than one mile from shore northwest of Moss Landing (Exhibit 4).</p> <p>Within one year of offshore cable installation, MBARI will complete the survey and submit the results to the Coastal Commission and the Monterey Bay National Marine Sanctuary. Within 60 days of completion of the survey, MBARI will process the data and provide: 1) A summary report; 2) Survey coverage maps; 3) Spreadsheets of target locations, including a target identification number, date that the target was imaged, latitude and longitude of the target, and depth; and 4) Seafloor imagery data in a format that is commonly used by most mapping software programs.</p>

Significant Issue Area	Proposed Special Conditions and Mitigation Measures
Marine Resources: Water Quality	<p>Issue: Vessel discharges would cause an adverse impact on water quality. Subsurface boring and installation of conduit can result in the release of bentonite, a drilling lubricant, to the marine environment.</p> <p>Special Conditions:</p> <p>Special Condition 9 prohibits the marine discharge of sewage, bilge or ballast water, or debris from vessels installing or repairing cable. The applicant has agreed to implement this requirement in federal waters.</p> <p>Special Condition 14 requires MBARI submit for the Executive Director's review and approval a revised Drilling Fluid Monitoring and Remediation Plan for Horizontal Directional Drilling (hereinafter "Drilling Plan") that includes the following additional elements: (1) use of water to lubricate the final three drill stems or pipes (approximately 100 feet) of the borehole; (2) back-flushing of residual drilling fluids with water prior to surfacing of the borehole on the seafloor, using equipment that is free of all hydrocarbons and associated contaminants (e.g., gasoline, crude, toluene, BTEX, and other HC products) for any conduit flushing; (3) use of the fluorescent dye rhodamine added to the drilling fluid together with a fluorometer (a dye detector) to identify any drilling fluids released into water; (4) use of side-scan sonar to assist in drilling release detection if the fluorometer detects a drilling fluid release; (5) visual monitoring and inspection onshore and offshore (by boat and with divers recording suspected releases on videotape); and (6) a set of contingency and response measures, including identification of a reasonable worst-case spill scenario, a list of spill response equipment to be kept onboard that is sufficient to respond to the identified worst-case spill scenario, an agency notification (call down list), and MSDS sheets for all chemicals/materials used in HDD.</p>
Commercial Fishing	<p>Issue: Trawlers may snag their gear on project cables that are insufficiently buried or exposed and thus experience significant economic losses from abandoned gear and lost fishing time.</p> <p>Special Conditions: To minimize gear entanglements, the Commission is requiring Special Conditions 4-8, 15, 17, 18, and 20, as described above under the Marine Resources issue area. For gear snags and losses that do occur, MBARI has committed to establishing a gear claim and cost reimbursement process. The gear loss claims process is described in the State Lands Commission's approved General Lease—Right of Way Use for the proposed project (PRC W 25980/R12903). MBARI has incorporated these provisions as part of its CDP application and consistency certification.</p>
Geology	<p>Issue: Drilling could cause a "frac-out" and drilling fluid release.</p> <p>Special Conditions:</p> <p>The Commission is requiring Special Condition 14, as discussed above under the Water Quality issue area.</p>

TABLE OF CONTENTS

SYNOPSIS	2
TABLE 1. Issue Summary: Potential Impacts and Proposed Conditions and Measures	3
TABLE OF CONTENTS	7
1.0 STAFF RECOMMENDATION	8
2.0 STANDARD CONDITIONS	9
3.0 SPECIAL CONDITIONS	9
4.0 FINDINGS AND DECLARATIONS	14
4.1 PROJECT DESCRIPTION	14
4.2 PRIOR FIBER OPTIC CABLE PROJECTS APPROVED BY COASTAL COMMISSION	17
4.3 THE COASTAL COMMISSION'S PERMIT AND FEDERAL CONSISTENCY JURISDICTION	17
4.4 RELATED APPROVALS	18
4.5 COASTAL ACT ISSUES	19
4.5.1 Dredging and Placement of Fill in Coastal Waters	19
4.5.2 Marine Resources and Water Quality	22
4.5.3 Oil Spills	35
4.5.4 Commercial Fishing	36
4.5.5 Geology	43
4.5.6 Public Access and Recreation	45
4.5.7 Cultural Resources	46
4.5.8 Air Quality	47
4.6 CALIFORNIA ENVIRONMENTAL QUALITY ACT	48
<u>Appendix A.</u> Substantive File Documents	49
Exhibit 1. Area Location and Marine Cable Route	
Exhibit 2. Science Node and Trawl-Resistant Frame	
Exhibit 3. Marine Mammal Monitoring Plan	
Exhibit 4. Mitigation Survey Area for Derelict Gear	

1.0 STAFF RECOMMENDATION

1.1 Approval with Conditions

The staff recommends conditional approval of Coastal Development Permit Application No. E-05-007.

Motion:

I move that the Commission approve Coastal Development Permit Application No. E-05-007 subject to the conditions set forth in the staff recommendation dated August 30, 2005.

Staff recommends a **YES** vote on the foregoing motion. Passage of this motion will result in conditional approval of the permit and adoption of the following resolution and findings. The motion passes only by affirmative vote of a majority of the Commissioners present.

Resolution:

The Commission hereby approves coastal development permit E-05-007 and adopts the findings set forth below on grounds that the development as conditioned will be in conformity with the policies of Chapter 3 of the Coastal Act and will not prejudice the ability of the local government having jurisdiction over the area to prepare a Local Coastal Program conforming to the provisions of Chapter 3. Approval of the permit complies with the California Environmental Quality Act because either 1) feasible mitigation measures and/or alternatives have been incorporated to substantially lessen any significant adverse effects of the development on the environment, or 2) there are no further feasible mitigation measures or alternatives that would substantially lessen any significant adverse impacts of the development on the environment.

1.2 Concurrence

The staff recommends the Coastal Commission adopt the following resolution:

Motion:

I move that the Commission concur in consistency certification CC-076-05 that the project described therein is consistent with the enforceable policies of the California Coastal Management Program (CCMP).

Staff recommends a **YES** vote on the motion. Passage of this motion will result in a concurrence in the certification and adoption of the following resolution and findings. An affirmative vote of a majority of the Commissioners present is required to pass the motion.

Resolution:

The Commission hereby concurs in the consistency certification by the Monterey Bay Aquarium Research Institute ("MBARI") on the grounds that the project described therein is consistent with the enforceable policies of the CCMP.

2.0 STANDARD CONDITIONS

1. **Notice of Receipt and Acknowledgment.** The permit is not valid and development shall not commence until a copy of the permit, signed by the permittee or authorized agent, acknowledging receipt of the permit and acceptance of the terms and conditions, is returned to the Commission office.
2. **Expiration.** If development has not commenced, the permit will expire two years from the date on which the Commission voted on the application. Development shall be pursued in a diligent manner and completed in a reasonable period of time. Application for extension of the permit must be made prior to the expiration date.
3. **Interpretation.** Any questions of intent of interpretation of any condition will be resolved by the Executive Director or the Commission.
4. **Assignment.** The permit may be assigned to any qualified person, provided assignee files with the Commission an affidavit accepting all terms and conditions of the permit.
5. **Terms and Conditions Run with the Land.** These terms and conditions shall be perpetual, and it is the intention of the Commission and the permittee to bind all future owners and possessors of the subject property to the terms and conditions.

3.0 SPECIAL CONDITIONS

This permit is granted subject to the following special conditions:

General Conditions

1. **Scope of Project Approval.** This permit authorizes those project activities specifically described in MBARI's June 6, 2005 coastal development permit application, as amended by letters and submittals dated July 7, 2005, July 11, 2005, August 22, 2005, and August 29, 2005, except as otherwise modified by the conditions of this permit. Any future modifications of or additions to the project, as described in the referenced documentation, shall require an amendment to this permit.
2. **Indemnification.** In addition to any immunities provided for by law, in exercising this permit, MBARI agrees to hold harmless and indemnify the Coastal Commission, its officers, employees, agents, successors and assigns from any claims, demands, costs, expenses and liabilities for any damage to public or private properties or personal injury that may result directly or indirectly from the project.

3. **Liability for Costs and Attorneys Fees.** MBARI shall reimburse the Coastal Commission in full for all costs and attorneys fees-- including (1) those charged by the Office of the Attorney General, and (2) any court costs and attorneys fees that the Coastal Commission may be required by a court to pay-- that the Coastal Commission incurs in connection with the defense of any action brought against the Coastal Commission, its officers, employees, agents, successors and assigns challenging the approval or issuance of this permit, the interpretation and/or enforcement of permit conditions, or any other matter related to this permit.

Mitigation Measures

4. **Cable Burial Depth.** The cable shall be buried to a depth of 1.0 meter except where precluded by seafloor substrates. Where a 1.0-meter burial depth cannot be achieved, MBARI shall bury the cable to the maximum depth feasible.
5. **As-Built Documentation.** Within 90 days of cable installation, MBARI shall submit to the Executive Director: (a) an as-built plan in writing (Route Position List) and on alignment or strip charts depicting bathymetry, seafloor substrates or features, seabed profile, depth of cable burial below the seafloor, and cable tension; (b) an electronic as-built plan; and (c) the as-built cable plan overlaid on National Oceanic and Atmosphere Administration ("NOAA") navigation charts.

For purposes of Special Conditions 5-8 of this permit, the cable shall be considered installed the day after MBARI's acceptance of cable installation work as complete by the contractor. The cable's location shall be documented using a differential global positioning system ("GPS"). Within 90 days of completing any cable repair or maintenance work, MBARI shall submit to the Executive Director and to all fishers licensed to operate within the project area updates of items "(a)-(c)" above.

6. **Installation Reports.** Within 90 days of cable installation, MBARI shall submit to the Executive Director: (a) an operations report describing any cable post-installation activities, including routine or non-routine post-lay surveys, repair activities, and cable inspection activities; and (b) a cable installation report containing, at minimum, the following: (i) a summary of pre-lay and installation operations; (ii) an as-laid position list with definitions for acronyms, time reference and locations of course alterations, repeaters and splice boxes. The information shall include: date, time, event, latitude, longitude, depth, incremental route distance, and any route deviations; (iii) a description of cable laying and burial equipment, and cable installation methods used; (iv) navigational and slack control equipment and methods; (v) identification of any areas of cable suspension greater than 1.0 meter from the seafloor; (vi) daily vessel reports and daily operations log; (vii) any additional acoustic, sub-bottom profile or other geophysical data generated that had not been previously submitted to the Executive Director; (viii) an evaluation of the consistency of cable installation with the project description and applicable special conditions of this permit; and (ix) a description of fishing activity during the pre-lay and cable installation project phases.

7. **Cable Surveying and Reburial.** Every 18-24 months MBARI shall survey the cable route to verify that buried cable has remained buried consistent with the as-built plan required by Special Condition 5. MBARI shall complete the first survey of the cable within 18-24 months of initial cable installation. The second survey shall be completed within 18-24 months of completion of the first survey. If, based on the results of the first two surveys, there is no evidence of cable movement (i.e., buried cable remains stable), MBARI may request in the form of a permit amendment application a reduction in subsequent survey intervals.

Surveys shall be conducted with a remotely operated vehicle ("ROV") equipped with video and by a party approved by the Executive Director. Within 30 days of survey completion, MBARI shall submit to the Executive Director a report describing the results of the survey (including example still images) and a copy of the videotape(s) recorded during the cable survey. The videotape(s) shall include a display that identifies the date, time, position, water depth, and heading of the ROV.

If a survey shows that a segment(s) of the cable is no longer buried consistent with the as-built plan required by Special Condition 5, MBARI shall, within 30 days of survey completion, submit to the Executive Director for approval a plan to re-bury those cable segments. Upon approval of the plan by the Executive Director, MBARI shall proceed to implement the plan in accordance with the time schedule specified therein.

8. **Update NOAA Charts.** Within 90 days of cable installation, MBARI shall submit evidence to the Executive Director that it has submitted to the National Oceanic and Atmospheric Administration ("NOAA")¹: (a) geographic coordinates of the cable as-built plan using a Differential Geographic Positioning System ("DGPS") unit or comparable navigational equipment; and (b) MBARI's point of contact and telephone number.
9. **Prohibition of Marine Discharge.** There shall be no marine discharge of sewage, bilge or ballast water, or debris from vessels installing or repairing the cable.
10. **Marine Wildlife Monitoring.** During all cable installation activities (including all repair and maintenance operations), MBARI shall implement the Marine Mammal Monitoring Plan dated July 11, 2005. Prior to cable installation activities, the Executive Director must approve the marine mammal monitors.
11. **Field Verification of Safety Zone.** Prior to issuance of this permit, MBARI shall submit for Executive Director review and approval a plan to verify in the field either prior to or on the first day of cable laying operations its estimated 160 dB 500-foot marine mammal safety zone. The plan shall include placement of an array of hydrophones at different depths and distances from the hydraulic plow. MBARI shall adjust the safety zone

¹ The NOAA contact to which the information is to be submitted is currently: Ms. Lyn Preston, Chief, Nautical Data Branch, NOAA, N/CS26 Station 7350, 1315 East West Highway, Silver Spring, MD 20910. Email for submittal of digital route position list: lyn.preston@noaa.gov Phone: (301) 713-2737 x123.

outward, if necessary, if the distance to a received sound level of 160dB is greater than 500 feet.

12. **Marine Wildlife Monitoring Report.** Within 30 days of the last day of all marine operations that require marine wildlife monitors onboard a vessel(s) pursuant to Special Condition 10, MBARI shall submit to the Executive Director and NOAA Fisheries a marine wildlife monitoring report prepared by the approved marine wildlife monitors. The report shall include: (a) an evaluation of the effectiveness of monitoring protocols and (b) reporting of (i) marine mammal, sea turtle, and other wildlife sightings (species and numbers); (ii) any wildlife behavioral changes that may have been attributable to project operations; and (iii) any project delays or cessation of operations due to the presence in the project area of marine wildlife species subject to protection under the Marine Mammal Monitoring Plan.
13. **Avoid and Eliminate Cable Suspensions.** To address portions of the route where cable burial is infeasible due to seafloor substrates, MBARI shall incorporate "best available technology," so that the cable will conform as close as technically possible to the contours of the seafloor. "Best available technology" shall include but not be limited to the use, where appropriate, of cable slack control. Before commencement of cable installation, MBARI shall use an autonomous underwater vehicle ("AUV") with multi-beam sonar to map the route. Based on the results of the AUV survey, MBARI shall route the cable to avoid, if feasible, all high relief (i.e., \geq 1-meter high) hard substrate.
14. **HDD Borehole Requirements.** Prior to issuance of this permit, MBARI shall submit for the Executive Director's review and approval a revised Drilling Fluid Monitoring and Remediation Plan for Horizontal Directional Drilling (hereinafter "Drilling Plan") that includes the following additional elements: (1) use of water to lubricate the final three drill stems or pipes (approximately 100 feet) of the borehole; (2) back-flushing of residual drilling fluids with water prior to surfacing of the borehole on the seafloor, using equipment that is free of all hydrocarbons and associated contaminants (e.g., gasoline, crude, toluene, BTEX, and other HC products) for any conduit flushing; (3) use of the fluorescent dye rhodamine added to the drilling fluid together with a fluorometer (a dye detector) to identify any drilling fluids released into water; (4) use of side-scan sonar to assist in drilling release detection if the fluorometer detects a drilling fluid release; (5) visual monitoring and inspection onshore and offshore (by boat and with divers recording suspected releases on videotape); and (6) a set of contingency and response measures, including identification of a reasonable worst-case spill scenario, a list of spill response equipment to be kept onboard that is sufficient to respond to the identified worst-case spill scenario, an agency notification (call down list), and MSDS sheets for all chemicals/materials used in HDD.
15. **Fishermen Notification.** At least 30 days prior to commencement of cable installation activities, MBARI shall use diligent good faith efforts to distribute written notification to any fisherman legally authorized to trawl in areas traversed by the cable route. MBARI shall obtain contact information for fishermen reporting catch in the project area from the California Department of Fish and Game ("CDFG"). The notification to fishermen, to be

sent by certified mail and posted at the Moss Landing Harbormaster's Office, and filed with the Monterey Bay Aquarium Research Institute, the Monterey Bay National Marine Sanctuary Office, and CDFG, shall: (a) describe the proposed project, (b) include a navigation chart overlaid with the exact coordinates of the proposed route, (c) contain a copy of all MBARI provisions dealing with entanglements, lost gear, and claims, and (d) provide MBARI's contact information.

16. **Radio Broadcasts.** During cable installation activities MBARI shall make daily radio broadcast announcements on the local fishers' emergency radio frequency that provide the current cable installation location and a toll-free number that can be called for additional information.
17. **Cable Entanglements and Gear Retrieval.** In the event that fishers snag the cable and lose or cut gear, or that any other type of entanglement occurs (e.g., whale), MBARI shall use all feasible measures to retrieve the fishing gear or object. MBARI shall notify the Executive Director within 48 hours of MBARI's knowledge of gear loss or other cable entanglement. Retrieval shall occur no later than six weeks after discovering or receiving notice of the incident, unless otherwise authorized by the Executive Director. If full removal of gear is not feasible, MBARI shall remove as much gear as practicable to minimize harm to wildlife (e.g. fishes, birds, and marine mammals). Within two weeks of completing the recovery operation, MBARI shall submit to the Executive Director a report describing (a) the nature of and location of the entanglement (with a map) and (b) the retrieval method used for removing the entangled gear or object, or the method used for minimizing harm to wildlife if gear retrieval proves infeasible.
18. **Cable Repairs.** MBARI shall provide notice in writing to the Executive Director and in a U.S. Coast Guard *Notice to Mariners* 15 days prior to any cable repair or maintenance activity, or as soon as possible for emergency repairs.
19. **Regional Water Quality Control Board Certification.** Prior to issuance of this permit, MBARI shall submit to the Executive Director evidence that the Regional Water Quality Control Board has approved a 401 Certification for the project.
20. **Cable Removal.** Within 90 days of either taking a cable out of service or after the expiration or sooner termination of MBARI's lease or permit, MBARI shall apply for an amendment to this permit to remove the cable from the territorial waters of the State of California. Upon approval by the Commission of the permit amendment, MBARI shall implement the cable removal project authorized by the amendment in accordance with the time schedule specified therein.

4.0 FINDINGS AND DECLARATIONS

4.1 Project Description

The Monterey Bay Aquarium Research Institute (hereinafter, "MBARI") proposes to install and operate the Monterey Accelerated Research System ("MARS") cabled observatory project. The project consists of a submarine cable to be laid between a shore station in Moss Landing and a science node that would be placed on the seabed on Smooth Ridge, approximately 31.7 miles west-southwest of Moss Landing and within the Monterey Bay National Marine Sanctuary. The science node, containing eight data ports that provide electrical power and data transfer capability, would be secured to the seabed at the end of the cable route within a trawl-resistant frame (Exhibit 2).

The purpose of the MARS cable is to support Monterey Bay oceanographic research. Research activities taking advantage of the MARS project would be directed at oceanographic features that are particularly well represented in Monterey Bay. Such features include the large and active submarine canyon, well-developed coastal upwelling and associated biological productivity, cold seeps and associated benthic faunas, and tectonic features associated with the eastern edge of the Pacific lithosphere plate. The cable and science node, by supplying both data links and electrical power, would allow researchers to gather real-time, continuous and long-term monitoring data of conditions beneath the surface of Monterey Bay. Currently such information can be gathered only during intermittent ship cruises or using temporary devices that must eventually be retrieved when their batteries are depleted. In addition to supporting oceanographic research within Monterey Bay, the project would serve as a testing ground for technologies to be used in more ambitious and remote undersea networks, such as the North-East Pacific Time Series Undersea Networked Experiments ("NEPTUNE") observatory in the Pacific Northwest, where the weather window is seasonal and remotely operated vehicles ("ROVs") are infrequently available.

The marine portion of the cable route extends seaward from the mean high tide line to a water depth of approximately 2,923 feet (891 m). From an onshore station in Moss Landing to 0.89 mile offshore, the cable is to be installed below the sea floor using Horizontal Directional Drilling ("HDD"). From 0.89 mile to approximately 31.7 miles offshore, the cable is to be installed with a hydraulic plow and buried to target depth of 1 meter, where feasible. The cable route extends offshore from Moss Landing to the northwest and west, north of the submarine Monterey Canyon, then turns southwest and south along the continental margin to the southeastern part of the Smooth Ridge (Exhibit 1).

MBARI estimates that approximately 76 percent (24.1 miles) of the cable can be buried to the target depth of 1 meter, where sand and clay substrates will allow full burial. Approximately 6 percent (1.9 miles) of the cable can be partially buried (not to the full 1-meter target burial depth). Burial will be difficult or infeasible for approximately 18 percent (5.7 miles) of the cable due to the presence of rock outcrops or steep slopes. (See Table 2 in Section 4.5.2.1 for additional detail.) The total estimated installation time for cable laying is 5 to 6 days; however, weather conditions and other difficulties could increase the time needed to complete the installation. An installation timeframe of a total of 10 to 14 days is assumed for completion of all cable laying activities. Cable laying activities will be undertaken 24 hours per day.

For the nearshore part of the cable, MBARI proposes to install an approximately 0.89-mile-long subsurface cable conduit by HDD from an onshore landing site located in Moss Landing near the north end of Sandholdt Road to an offshore point on the seafloor at an approximate water depth of 50 feet. The HDD drill site is located within the County of Monterey's certified local coastal program ("LCP") permitting jurisdiction and therefore will require a separate permit from the County.

HDD is a subsurface boring technology in which the drill head is fitted with a steering tool that uses magnetometers and inertial devices to track the direction of advance (horizontal and vertical) and the absolute location of the drill head. Bentonite clay is mixed with water and used as a drilling fluid to lubricate the bore, cool the drill, and keep the hole open by sealing the outer surface of the bore. The depth of the drill path will be approximately 56 feet below the sea floor, in order to prevent the possible release of drilling fluid while remaining above possible subterranean formations that may occur at greater depths. During installation, the conduit is advanced in sections through the borehole as it is drilled. The HDD operations are expected to take approximately 2 weeks.

The remainder of the offshore cable, from 0.89 mile offshore to the seabed on Smooth Ridge, is to be installed using a hydraulic plow, which simultaneously cuts a trench and buries the cable as the plow moves along the seabed. In areas where rocky or steep substrate prevents burial of the cable, the plow is raised above the obstruction and cable is laid out along the surface until the substrate allows burial. In order to clear the cable route of obstacles that a cable plow or remotely operated vehicle ("ROV") may encounter, a grapnel (an anchor-like hook) will be pulled along the cable route in a pre-lay grapnel run immediately prior to cable installation. If the grapnel hooks debris, the towing will cease and the grapnel and associated debris will be retrieved and stowed on the vessel for proper disposal onshore. Grapnel operations will not take place over rocky substrates.

In the event of an accidental oil spill during cable laying operations, MBARI's construction vessel, the Maersk Defender, has a contract with the California-approved oil spill response organization, the National Response Corporation ("NRC"). NRC is approved by the Office of Spill Prevention and Response ("OSPR") to provide oil spill containment and clean up operations in the open ocean waters of Monterey Bay. However, NRC does not have oil spill response equipment and personnel permanently located in the Monterey Bay area. The closest location for NRC oil spill response equipment and personnel is the San Francisco Bay area, which is between 109-120 miles north and about 2-3 hours transport time under the best traffic conditions. Therefore, in a letter dated August 29, 2005, MBARI amended its project description to address the California Office of Spill Prevention and Response ("OSPR") regulations (14 CCR Section 827.02(h)(2)(B)(2)(iii)), which require that "vessels operating in the Monterey Bay shall have containment boom and associated deployment equipment for a 2500 barrel spill pre-staged such that it can be immediately deployed." Accordingly, NRC shall provide sufficient containment boom, skimmers, and associated deployment equipment (i.e., boats and trained personnel), to contain and clean up a 2,500-barrel spill.

For areas where the cable cannot be buried by the plow, the cable will be post-lay buried where possible using an ROV. ROV operators will use jetting tools to loosen and liquefy seafloor sediments beneath the cable and allow the cable to settle to the desired depth. The ROV will also be equipped with a depressor, which is shaped like an arm at the rear of the ROV and is used to press the cable into the trench of liquefied sediment. The cable-laying vessel will use an ROV to conduct post-lay inspection and burial of the cable. Post-lay inspection and burial activities include the following: 1) inspection of the splice positions in the buried sections of the cable; 2) jet burial in the plowed sections where the plow could not bury the cable; and 3) burial and inspection of any unburied sections of the cable remaining from the deployment of the science node. Post-lay inspection and burial activities require one to two days for completion and closely follow that of the main lay vessel. The activities are designed to minimize additional impacts to biological resources where maximum cable burial is not achieved and to reduce the risk to the exposed cable.

After cable laying is complete, MBARI will place on the seafloor at the seaward end of the cable a trawl resistant node frame. The science node is then lowered onto the ocean floor near the frame. An ROV will latch onto the science node, lift it, and then lower it into the frame. The ROV then attaches the underwater connectors between the node and the frame to allow the node electronics to be connected to the shore through the cable.

The proposed project also includes the repair and maintenance of the science node and cable, as needed. The science node has been designed to allow repairs without disturbing the cable. Most of the communications and power electronics are contained within the node, which can be removed with an ROV without disturbing the cable and trawl-resistant frame. The ROV can bring the node to the surface where it can be transported to MBARI's shore facilities for repair or maintenance. MBARI does not anticipate that any cable maintenance will be required over the life of the cable. However, the cable could be damaged by slumping, saltwater intrusion, or anchors or fishing gear could snag the cable. If the cable were damaged, a cable ship would be brought in to repair the cable. If the repaired section of cable were previously buried, MBARI will rebury it to the maximum extent possible using an ROV jetting tool.

MBARI proposes to remove the cable and node at the end of the project's operational life (25 years). Future removal of the cable will require a separate coastal development permit and consistency certification. If, in the future, MBARI proposes the placement of any additional equipment or structures on the seafloor, this may trigger the need for additional federal consistency review of such proposed activities.

On August 8, 2005, the State Lands Commission certified a final EIR/EIS and approved a 25-year lease for the project. On August 22, 2005, MBARI submitted an amendment to the project description of both CDP application E-05-007 and Consistency Certification CC-076-05, stating MBARI's commitment to implement the requirements of the State Lands Commission's approved General Lease--Right of Way Use for the cable, including the SLC-approved Mitigation Monitoring Program. Specific lease requirements are discussed where relevant in Section 4.5 of this report, which discusses potential impacts of the proposed project on coastal resources and uses.

4.2 Prior Fiber Optic Cable Projects Approved by Coastal Commission

The Coastal Commission has approved the following fiber optic cable projects:

- In January 1992, the Coastal Commission approved the installation, operation, and maintenance of one cable, HAW-5, and four conduits (#4-91-61) offshore of Montana de Oro State Park.
- In September 1994, the Coastal Commission approved two additional cables, TPC5-T1 and TPC5-G (#4-91-61-A1) offshore of Montana de Oro State Park.
- In April 2000, the Coastal Commission approved the installation of two fiber optic cables and five offshore conduits by MFS Globenet and MCI WorldCom (E-99-011) at Montana de Oro State Park.
- In May and June 2000, the Coastal Commission approved the installation of two fiber optic cables by AT&T (E-98-029) off of Montana de Oro State Park.
- In June 2000, the Coastal Commission approved the installation of three fiber optic cables and three conduits by PC Landing Corporation and PAC Landing Corporation at Grove Beach (E-98-27).
- In September 2000, the Coastal Commission approved the installation of one fiber optic cable and five conduits at Manchester State Beach, and one cable off of Montana de Oro State Park by AT&T Corporation (E-00-004).
- In December 2000, the Coastal Commission approved the installation of a festoon fiber optic cable along the California coastline landing onshore at four locations (Morro Bay, Leadbetter Beach in Santa Barbara, Manhattan Beach, and Mission Beach in San Diego) by Global West Network, Inc. (E-00-008).
- In July 2002, the Coastal Commission approved the installation of two fiber optic cables landing at the City of Hermosa Beach in Los Angeles County by Tyco Networks (US), Inc. (E-01-029).

Through its federal consistency authority, the Coastal Commission has also concurred with consistency certifications, consistency determinations, and negative determinations for a number of submarine fiber optic cable-related projects by, for example, the Navy, Coast Guard, and Federal Aviation Administration.

4.3 The Coastal Commission's Permit and Federal Consistency Jurisdiction

The Coastal Commission retains coastal permit jurisdiction over project areas on public trust lands, tidelands, and submerged lands from the mean high tide line to 3 nautical miles offshore. Therefore, that portion of the project that involves cable laying within State waters (*i.e.*, seaward of the mean high tide line to 3 nautical miles offshore) requires issuance of a permit from the Coastal Commission and is the subject of coastal development permit application E-05-007.

The offshore component of the project also requires a federal permit from the United States Army Corps of Engineers ("ACOE") and therefore requires a consistency certification pursuant to Section 307(c)(3)(A) of the Coastal Zone Management Act. For the portion of the project that lies in State waters, the consistency certification is redundant; the coastal development permit serves as a consistency certification. For the portion of the project that lies outside the coastal

zone in federal waters, the applicant has submitted a consistency certification (CC-076-05) to the Coastal Commission.

On June 30, 2005 (and as amended in a letter dated August 29, 2005), MBARI submitted a consistency certification to the Coastal Commission certifying that the proposed activity complies with California's approved coastal management program ("CCMP") and will be conducted in a manner consistent with the CCMP.

This staff report is a combined coastal development permit and consistency certification.

4.4 Related Approvals

4.4.1 State Lands Commission

For this project, the State Lands Commission is the "lead agency" under the California Environmental Quality Act ("CEQA"). The State Lands Commission and the Monterey Bay National Marine Sanctuary prepared a joint Environmental Impact Report/Environmental Impact Statement ("EIR/EIS"). On August 8, 2005, the State Lands Commission certified the final EIR/EIS and approved a 25-year lease for the project. In part, the State Lands Commission will require of MBARI a \$500,000 surety bond for the placement of cable and equipment on the seafloor. The State Lands Commission will also have onboard the cable-laying vessel at all times a monitor to ensure that the cable is laid consistent with agency approvals.

4.4.2 County of Monterey

The onshore components of the project (e.g., temporary HDD drilling site, small building) are located within the County of Monterey's certified local coastal program ("LCP") jurisdiction. The Monterey County Department of Planning and Building Department is currently processing a coastal development permit application request.

4.4.2 Regional Water Quality Control Board ("RWQCB")

The Central Coast Regional Water Quality Control Board ("RWQCB") regulates waste discharges into receiving waters in the project area. MBARI submitted an application for the proposed project to the RWQCB on July 19, 2005. Prior to issuance of this permit, MBARI is required by Special Condition 19 to submit to the Executive Director of the Coastal Commission (hereinafter, "Executive Director") evidence that the Regional Water Quality Control Board has approved 401 Certification for the project.

4.4.3 U.S. Army Corps of Engineers ("ACOE")

The U.S. Army Corps of Engineers ("ACOE") has regulatory authority over the proposed project under Section 10 of the Rivers and Harbors Act of 1899 (33 U.S.C. 1344), Section 404 of the Clean Water Act, and Section 4(f) of the Outer Continental Shelf Lands Act ("OCSLA"), as amended. Section 10 of the Rivers and Harbors Act regulates the diking, filling and placement of structures in navigable waterways. Section 404 of the Clean Water Act regulates fill or discharge

of materials into waters and ocean waters. Section 4(f) of the OCSLA requires a permit for the construction of artificial islands, installations, and other devices on the seabed to the seaward limit of the outer continental shelf. According to the ACOE, cable laying on the seafloor beyond the three-mile State limit is considered an "installation" and "other device" on the seabed.

On June 13, 2005, MBARI submitted to the ACOE an application for a Section 12 Nationwide Permit for discharges of dredged or fill material associated with excavation and installation of the proposed project. As required by the federal Endangered Species Act, the ACOE has initiated consultation with the U.S. Fish and Wildlife Service and NOAA Fisheries.

Pursuant to Section 307(c)(3)(A) of the Coastal Zone Management Act, any applicant for a required federal permit to conduct an activity affecting any land or water use or natural resource in the coastal zone must obtain the Coastal Commission's concurrence in a certification to the permitting agency that the project will be conducted consistent with California's approved coastal management program.

4.5 Coastal Act Issues

4.5.1 Dredging and Placement of Fill in Coastal Waters

Coastal Act §30233 (a) states, in part:

The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to the following:

- (1) New or expanded port, energy, and coastal-dependent industrial facilities, including commercial fishing facilities.*
- (2) Maintaining existing, or restoring previously dredged depths on existing navigational channels, turning basins, vessel berthing and mooring areas, and boat launching ramps.*
- (3) In wetland areas only, entrance channels for new or expanded boating facilities; and in a degraded wetland, identified by the Department of Fish and Game pursuant to subdivision (b) of Section 30411, for boating facilities if, in conjunction with such boating facilities, a substantial portion of the degraded wetland is restored and maintained as a biologically productive wetland. The size of the wetland area used for boating facilities, including berthing space, turning basins, necessary navigation channels, and any necessary support service facilities, shall not exceed 25 percent of the degraded wetland.*
- (4) In open coastal waters, other than wetlands, including streams, estuaries, and lakes, new or expanded boating facilities and the placement of*

structural pilings for public recreational piers that provide public access and recreational opportunities.

- (5) *Incidental public service purposes, including but not limited to, burying cables and pipes or inspection of piers and maintenance of existing intake and outfall lines.*
- (6) *Mineral extraction, including sand for restoring beaches, except in environmentally sensitive areas.*
- (7) *Restoration purposes.*
- (8) *Nature study, aquaculture, or similar resource dependent activities.*

Coastal Act § 30108.2 defines “fill” as “earth or any other substance or material ... placed in a submerged area.” The fiber optic cable and science node to be placed on the seafloor constitute fill under this definition. The pre-lay grapnel run will create an approximate 8-inch wide, 1.3-foot deep swath of disturbance. Depending on soil conditions, burying the cable could form sidecast berms of 3.3 feet (1 m) to 6.6 feet (2 m) in width. These activities collectively constitute a form of “dredging” for purposes of §30233.

Coastal Act §30233(a) authorizes a project that includes dredging and/or fill of open coastal waters only if it meets three tests. The first test requires the proposed activity to fit into one of eight categories of uses enumerated in Coastal Act §30233(a)(1)-(8). The second test requires that there be no feasible less environmentally damaging alternative. The third and last test mandates that feasible mitigation measures be provided to minimize the project’s adverse environmental effects.

(1) Allowable Use Test

The proposed project, consisting of an undersea research cable and science data and power node in Monterey Bay, is coastal-dependent as defined in Section 30101 because it requires “a site on, or adjacent to, the sea to be able to function at all.” The Commission thus finds that the proposed project meets the allowable use test of Coastal Act §30233(a)(1). In addition, Coastal Act §30233(a)(8) allows filling of open coastal waters for “Nature study, aquaculture, or similar resource dependent activities.” The express purpose of the MBARI cable project is for scientific research, specifically to provide researchers with long-term, real-time data access to deep-sea benthic communities and ocean processes. Accordingly, the Commission also finds that the project qualifies as “nature study” and is therefore an allowable use under 30233(a)(8). The Commission therefore finds that the proposed project meets the first test of Coastal Act Section 30233(a).

(2) No Feasible Less Environmentally Damaging Alternative

After qualifying as an allowable use under §30233(a), the Commission must find that there is no (a) feasible and, (b) less environmentally damaging alternative to the proposed project. Coastal Act §30108 defines “feasible” as “...capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social and

technological factors.” Since the express purpose of the project is to provide researchers with long-term, real-time data access to deep-sea benthic communities and ocean processes of the Monterey Bay National Marine Sanctuary, there are no alternatives to the use of the fiber optic cable and science node that would avoid the use of “fill.” Nevertheless, the EIR/EIS for the proposed project examined alternative routes and configurations to determine if a feasible alternative exists that would minimize the amount of fill and dredging.

(a) Alternative Project Configuration

The EIR/EIS evaluated the possibility of using a series of moored buoys and shorter lengths of fiber optic cable installed on the sea floor. This alternative could be a less environmentally damaging alternative because a much shorter length of cable would be installed on seafloor. Further, use of a moored buoy system would result in a reduction of impacts on benthic communities by the elimination of cable-burying activities. However, potential impacts on marine mammals and fishing activities would be increased from possible entanglement in the buoy mooring lines. Moored buoys would require annual removal and maintenance, which would result in the abandonment of the unit’s anchoring structures each time the unit is serviced. Data collection and experiments being conducted at science nodes attached to the anchoring structures would be disrupted by this annual maintenance schedule.

The EIR/EIS also concludes that this alternative would not meet the project objectives because a system of moored buoys cannot provide the same cable system design, power requirements, and data transfer capability required for long term undersea experiments. Another significant issue is the reliability of the power and data cable-mooring line interface. Current buoy line technology incorporates electrical and optical conductors along the length of the steel mooring cable. Both the data and fiber optic cables have a low stretch tolerance and high susceptibility to failure. While MBARI currently deploys several moored buoy data systems in Monterey Bay, they are not configured to support the wide array of equipment that would be used for the project and cable breakages would limit the types of scientific experiments that could be conducted in Monterey Bay.

(b) Alternatives to the Offshore Routes

The EIR/EIS also examined an alternative marine route for the proposed cable project, with a route extending from the shore into Monterey Bay along the south side of the Monterey Bay Canyon. This alternative route would not, however, meet the purpose and need of the proposed project, because the southern route could not reach a location on the western side of the San Gregorio Fault line without crossing the Monterey Canyon. This would expose the cable to substantial risk of landslide and mass wasting events, which frequently occur within the Canyon. Equipment or cables placed in the Canyon would likely survive less than one year before being destroyed. One of the scientific aims of the proposed project is to connect the cable to a permanent broadband seismometer located west of the San Gregorio Fault, to provide better directional coverage of seismic events and thereby improve the characterization of moderate to large earthquakes occurring in northern California along the San Andreas fault system. In addition, if the science node were placed in a location where it does not cross the submarine canyon, the maximum possible depth of the node would be only 427 feet, and the proposed

project requires proximity to a deep-water site (i.e., the submarine Monterey Canyon) in order to adequately test the project's research components and systems.

The Commission therefore finds that there is no feasible less environmentally damaging alternative marine route to the proposed project. Accordingly, the Commission finds that the proposed project is the least environmentally damaging feasible alternative and therefore meets the second test of Coastal Act §30233(a).

(3) *Feasible Mitigation Measures*

The final requirement of Coastal Act §30233(a) is that dredging and filling of coastal waters may be permitted if feasible mitigation measures have been provided to minimize any adverse environmental impacts. In other sections of this report, the Commission has identified feasible mitigation measures that will minimize the project's adverse environmental impacts. With the imposition of the conditions of this permit, in combination with MBARI's commitment to implement similar requirements in federal waters, the Commission finds that the third and final test of Coastal Act §30233(a) has been met.

Because the three tests have been met, the Commission therefore finds the proposed project consistent with Coastal Act §30233(a).

4.5.2 Marine Resources and Water Quality

Coastal Act §30230 states:

Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Coastal Act §30231 states:

The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Cable laying could cause the following potential marine resource and water quality impacts:

(1) marine mammal entanglements on unburied or suspended cable, or on other lines such as the plow tow rope; (2) marine mammal collisions with project vessels; (3) impacts to hard-substrate

and soft-substrate benthic species and habitat due the pre-lay grapnel run, cable installation, operation and repair; (4) impacts to filter-feeding benthic organisms due to increased turbidity and resettling of potentially contaminated sediments within Monterey Bay; (5) impacts to benthic habitat and water quality due to a release of the drilling fluid bentonite if a "frac-out" occurs during horizontal directional drilling operations; and (6) water quality impacts from release of project vessel sewage and bilge or ballast water.

4.5.2.1 Marine Mammal Impacts

There are three potential types of impacts to marine mammals and other marine wildlife due to the proposed project: entanglement with project cables or other lines, noise impacts, and collision with project vessels.

Potential Marine Mammal Entanglement with Project Cables

Whales and other marine mammals that travel through coastal waters in the project area may become entangled in unburied or insufficiently buried cable, or in cable suspensions.

Approximately 76 percent (24.1 miles) of the cable will be buried to the target depth of 1 meter, where sand and clay substrates will allow full burial. Approximately 6 percent (1.9 miles) of the cable will be partially buried. Burial will be difficult or infeasible for approximately 18 percent (5.7 miles) of the cable due to the presence of rock outcrops or steep slopes. (See Table 2 below.)

The Marine Mammal Protection Act of 1972 protects whales. In addition, the sperm whale is federally listed as an endangered species and is therefore protected by the federal Endangered Species Act. Gray whales have been delisted from the federal endangered species list due to increased population numbers. Cable entanglement with other marine mammals such as pinnipeds (*e.g.*, sea lions, harbor seals) and fissipeds (*e.g.*, sea otters), or with sea turtles, is not expected to occur because these animals do not exhibit similar diving and/or feeding behaviors in bottom sediments.

To date, whale entanglement with fiber optic cables has not been reported offshore California. Of the whale species (*i.e.*, gray, humpback, blue, fin, sei, sperm) that are known to migrate past the project area, three species--the California gray whale (*Eschrichtius robustus*), the sperm whale (*Physeter macrocephalus*), and Baird's beaked whale (*Berardius bairdii*)--have the potential to become entangled due to bottom-feeding behavior or deep-diving behavior.

Approximately 20,000 gray whales migrate through California waters each year between Alaskan waters and Baja California. Due to their abundance off the Pacific coast, their tendency to hug the shoreline during migration, and their bottom feeding patterns, gray whales may face the highest risk of entanglement with insufficiently buried or exposed cables. The majority of southbound (November to January) gray whales migrate within 2 nautical miles from shore, while the northbound migration occurs much closer to shore with mother and calves reported within kelp beds and sometimes only yards from the shoreline. Gray whales can dive in waters from 150 to 200 meters deep, but usually prefer shallower water. Gray whales usually feed nearshore in soft-bottom sediments, and also typically feed opportunistically during migration (MMS 1989).

Sperm whales are much less abundant off the coast of California than gray whales, numbering only approximately 1,200 individuals. Sperm whales typically inhabit deep open waters, and are the deepest and longest diving of all cetaceans. The area where sperm whales are most frequently sighted in the Monterey region is around Davidson Seamount, outside the Sanctuary boundaries and beyond the project area (Hall and Kum 2001).

Baird's beaked whale (*Berardius bairdii*) is the largest of the beaked whales, and can grow up to 40 feet long and travel in pods of up to 20 animals, with the adults being often heavily scarred. These whales are found annually in Monterey Bay, usually in summer and fall. Although little is known of their life history, they apparently eat squid, deep-sea fishes, and crustaceans. They can dive for up to 40 minutes.

While the risk of whale entanglement with the project cable is considered low, the risk of entanglement with the cable is increased for those portions of the cable that are unburied or suspended above the seafloor. MBARI estimates that approximately 6 percent (1.9 miles) of the cable will be partially buried. Burial will be difficult or infeasible for approximately 18 percent (5.7 miles) of the cable due to the presence of rock outcrops or steep slopes. (See Table 2 below.)

Table 2. Summary of Burial Feasibility in State and Federal Waters

Cable Location miles (km)	Water Depth feet (meters)	Expected Burial Depth	Soil Type
0 to 18.6 (0 to 30)	55 to 78 (17 to 88)	Full	Loose to medium dense sand or very soft to soft clay
18.6 to 19.7 (30 to 31.7)	288 to 300 (88 to 92)	Partial	Very soft clay over very dense sand
19.7 to 25.2 (31.7 to 40.6)	300 to 1448 (92 to 441)	Limited /No burial	Very stiff to hard clay/rock
25.2 to 26.1 (40.6 to 42)	1448 to 1556 (441 to 475)	Partial	Soft to very stiff clay, weakly cemented
26.1 to 31.7 (42 to 51)	1556 to 2923 (475 to 891)	Full	Very soft to firm clay

Source: MARS Geophysical & Burial Assessment Surveys, Fugro, 2004.

Given the diving depth ranges of gray, sperm, and beaked whales, and the bottom-foraging behavior of gray whales, cable suspensions increase the risk of whale entanglement in cables. In addition, due to the protection of these marine mammals under the Endangered Species Act and the Marine Mammal Protection Act, entanglement or injury impacts due to insufficiently buried or exposed cables would be significant.

To minimize the risk of marine mammal entanglement with the cable, the Commission is imposing the following conditions:

- **Special Condition 4** requires MBARI to bury the cable in State waters to a depth of 1.0 meter except where precluded by seafloor substrates. Where a 1.0-meter burial depth cannot be achieved, MBARI is to bury the cable to the maximum depth feasible. This depth represents a protection factor of roughly 300% when compared with the depth (15-25 cm) at which gray whales are believed to trench into bottom sediments. In federal waters, MBARI has agreed to also achieve a 1.0-meter cable burial depth where feasible.
- **Special Condition 7** requires that every 18 to 24 months, MBARI shall survey the cable route in State waters to verify that buried cable has remained buried consistent with the as-built plan required by Special Condition 5. MBARI shall complete the first survey of the cable within 18-24 months of initial cable installation. The second survey shall be completed within 18-24 months of completion of the first survey. If, based on the results of the first two surveys, there is no evidence of cable movement (i.e., buried cable remains stable) MBARI may seek a change to subsequent survey intervals through a modification to the consistency certification.

Surveys shall be conducted with a remotely operated vehicle ("ROV") equipped with video and by a party approved by the Executive Director. Within 30 days of survey completion, MBARI shall submit to the Executive Director a report describing the results of the survey (including example still images) and a copy of the videotape(s) recorded during the cable survey. The videotape(s) shall include a display that identifies the date, time, position, water depth, and heading of the ROV.

If a survey shows that a segment(s) of the cable is no longer buried consistent with the as-built cable burial plan required by Special Condition 5, MBARI shall, within 30 days of survey completion, submit to the Executive Director for approval a plan to re-bury those cable segments. Upon approval of the plan by the Executive Director, MBARI shall proceed to implement the plan in accordance with the time schedule specified therein.

- MBARI has prepared a Marine Mammal Monitoring Plan that includes establishment of a 500-foot marine mammal safety zone and commitment to undertake marine mammal monitoring during cable laying activities. Two trained marine wildlife monitors approved by the Executive Director in consultation with NOAA Fisheries shall be onboard the cable installation vessel (including all repair and maintenance operations) at all times (with two monitors working during each 12-hour shift, alternating work shifts of a maximum of 4 hours each) to monitor for marine wildlife in the project area. During daytime observations, all monitors shall use 7 x 50 reticulated binoculars. During

nighttime observations, all monitors shall use nighttime vision equipment. MBARI shall ensure that the monitors have a 360-degree view of all activities during all marine operations (e.g., cable installation, post-lay inspection, burial, maintenance and repair, retrieval of entangled fishing gear, and inspection surveys). If a marine mammal approaches the work area (defined as a 500-foot or 152-meter "safety zone"), or the monitors determine that project operations have the potential to threaten the health or safety of marine wildlife or "take" a protected species as defined by regulations implementing the federal Endangered Species Act and the Marine Mammal Protection Act, the monitors shall have the authority to order cessation of all project operations until the monitors determine there is no longer a threat and/or the animal(s) transits the area. The captain shall comply with this order as soon as it safe to do so and for as long as the order remains in effect. **Special Condition 10** requires MBARI to implement the Marine Mammal Monitoring Plan (Exhibit 3).

- **Special Condition 12** requires MBARI to submit, to the Executive Director and NOAA-Fisheries, within 30 days of the last day of all marine operations that require marine wildlife monitors onboard a vessel(s) pursuant to Special Condition 10, a marine wildlife monitoring report prepared by the approved marine wildlife monitors. The report shall include: (a) an evaluation of the effectiveness of monitoring protocols and (b) reporting of (i) marine mammal, and other wildlife sightings (species and numbers); (ii) any wildlife behavioral changes that may have been attributable to project operations; and (iii) any project delays or cessation of operations due to the presence in the project area of marine wildlife species subject to protection under the Marine Mammal Monitoring Plan.
- **Special Condition 13** requires MBARI to address portions of the route where cable burial is infeasible due to seafloor substrates by incorporating "best available technology" to minimize cable slack and suspension so that the cable will conform as closely as technically possible to the contours of the seafloor. "Best available technology" must include but not be limited to the use, where appropriate, of cable slack control. Before commencement of cable laying, MBARI shall use an autonomous underwater vehicle ("AUV") with multi-beam sonar to map the route. Based on the results of the AUV survey, MBARI shall route the cable to avoid, if feasible, all high relief (i.e., 1-meter high) hard substrate. During post-lay inspection and burial operations, MBARI shall use an ROV to reposition and/or bury to 1.0-meter any suspended or exposed cable segment, unless precluded by seafloor substrates.
- **Special Condition 17** provides a system for minimizing cable impacts to marine wildlife by requiring that if any type of entanglement occurs (e.g., whale), MBARI shall use all feasible measures to retrieve the fishing gear or object. MBARI shall notify the Executive Director within 48 hours of MBARI's knowledge of gear loss or other cable entanglement. Retrieval shall occur no later than 6 weeks after discovering or receiving notice of the incident, unless otherwise authorized by the Executive Director. If full removal of gear is not feasible, MBARI shall remove as much gear as practicable to minimize harm to wildlife (e.g., fishes, birds, and marine mammals). Within two weeks of completing a recovery operation, MBARI shall submit to the Executive Director a report describing (a) the nature and location of the entanglement (with a map) and (b) the

retrieval method used for removing the entangled gear or object, or the method used for minimizing harm to wildlife if gear retrieval proves infeasible. Over time, this type of monitoring may eventually contribute to an up-to-date risk assessment of entanglement impacts.

- **Special Condition 20** requires that within 90 days of either taking the cable out of service or after the expiration or sooner termination of MBARI's lease(s) or permit(s), MBARI shall apply for an amendment to this permit to remove the cable from the territorial waters of the State of California. Upon approval by the Commission of the permit amendment, MBARI shall implement the cable removal project authorized by the amendment in accordance with the time schedule specified therein.

MBARI has committed to implement these same requirements in federal waters. With these measures in place, the Commission believes that the project will minimize any risk of harm to marine mammals and that healthy populations of the species will be maintained as required by section 30230 of the Coastal Act.

Noise

Because the drill rig is located onshore, no underwater noise impacts should be generated by HDD operations. The EIR/EIS estimates that cable-laying vessels will create underwater noise levels up to 180 dB, and plowing operations can generate sound levels of up to 185 dB.

Anthropogenic sound in the sea may have several direct, negative effects on marine mammals, including:

- Physical injury to marine mammals' auditory systems, resulting in temporary or permanent reductions in hearing sensitivity;
- Interfering with marine mammals' abilities to detect calls, pulses, or other important natural sounds (such as calls of predators);
- Disturbing or altering marine mammal behavior, which can cause stranding and mortality; and
- Non-auditory physical trauma to several species of cetaceans, most notably the beaked whale, which can cause stranding and mortality.

In determining acceptable levels of impulsive underwater sound under the Marine Mammal Protection act, NOAA Fisheries has typically relied on a two-part harassment definition – Level A harassment (injury), occurring at a received level threshold of 180 dB, and Level B harassment (not causing direct injury, but potentially affecting important biological functions), occurring at 160 dB (and at 120 dB for continuous sound). Ample evidence exists that sound levels of 140 dB can cause behavioral responses, and the issue of noise thresholds remains highly controversial.

The EIR/EIS estimates that noise levels from the plow will attenuate to 160 dB at 100 feet (30 meters). MBARI proposes to establish a 500-foot marine mammal safety zone. While the 500-foot safety zone may be conservative, there is a high degree of uncertainty about the appropriate size of a marine mammal safety zone. How sound attenuates in water is complicated

and based on many site-specific factors, including depth of water and bathymetry. Given this uncertainty, an applicant can use on the first day of the underwater activity an array of hydrophones placed at different depths and distances to verify the size of the safety zone. This field verification would allow MBARI to calibrate predicted results with actual field conditions and then adjust, if necessary, the size of the impact or safety zone. To ensure that the 500-foot marine mammal safety zone is adequate, **Special Condition 11** requires that prior to issuance of this permit MBARI submit for Executive Director review and approval a plan to verify in the field either prior to or on the first day of cable laying operations its estimated 160 dB 500-foot marine mammal safety zone. The plan shall include placement of an array of hydrophones at different depths and distances from the hydraulic plow. MBARI shall adjust the safety zone outward, if necessary, if the distance to a received sound level of 160dB is greater than 500 feet.

Marine Mammal Collision with Project Vessels

Another potential impact to marine mammals is collision with project vessels during all marine operations associated with the proposed project. Various species of whales could be present in the project area at all times of the year. Project vessels will be in the project area for up to fourteen days for cable lay and burial, for one to two days during post-lay inspection and burial, and during cable repair and maintenance activities. Whales are sensitive to noise and typically avoid large vessels, and that the likelihood of whale collision with cable vessels is low due to the slow speeds of cable vessels. However, whale-vessel collisions do occur. During cable installation, four project-related vessels would be operating in the project area. Because of the low level of vessel traffic associated with the cable installation operations, the short duration off offshore activities (up to 2 weeks), and the slow speed at which the lay vessel will be moving, a collision with a marine mammal during cable placement is unlikely.

The most effective way to prevent marine mammal collisions with project vessels is to monitor effectively for the presence of marine mammals in the project area. As described above, MBARI will have two marine mammal observers on board the cable installation vessel at all times. These monitors will be authorized to stop or modify cable installation activities to avoid a collision with a marine mammal.

4.5.2.2 Hard-Bottom Impacts

Hard substrate (or hard bottom) areas are exposed rocky substrates that provide habitat for a diverse group of plants and animals. Impacts (e.g., crushing, displacement) to rocky substrates can occur during the pre-lay grapnel run and cable lay, burial, operation and repair. Laying the cable on rocky substrates will disrupt associated bottom communities, likely crushing and/or dislodging small, sessile or relatively sedentary invertebrates along a narrow strip. Adverse impacts to high-relief substrate in particular are significant because: (1) deepwater reefs are relatively rare along the central California coast; (2) they support a diverse assemblage of epifaunal invertebrates; (3) they attract fish as a nursery ground, food source, and as shelter; and (4) epibiota residing on rocky substrates are sensitive to mechanical disturbance and increased sediment loads. During the pre-lay grapnel run, MBARI has committed to avoiding areas of rocky substrates.

Predominant species occurring exclusively on hard substrate along the cable route are encrusting and vase sponges; the anemone *Metridium farcimen*; the alcyonacean (soft coral) *Anthomastus ritteri*; brachiopods (*Laqueos californianus*); crinoids (*Florometra serratissima*); gorgonians, basket stars (*Gorgoncephalus eucnemis*); and sea cucumber (*Psolus squamata*). Species residing on hard bottom could be harmed by placing the cable directly on hard substrate and by "strumming" or lateral movement of cable over the course of the cable's life. Cable "strumming" could also damage the hard substrate itself.

MBARI can avoid all hard substrate in State waters. However, it is not able to avoid all hard substrate along its route in federal waters. The estimated amount of hard bottom affected is calculated by multiplying the length of rocky substrate (5.7 miles or 8,900 meters) times the width of the impact area, which, if "strumming" of the 2.8-cm diameter cable occurs, is estimated to be 10 cm. Based on this estimate, approximately 890 square meters of hard bottom habitat will likely be affected by cable laying.

In past approvals of fiber optic cable projects that unavoidably affected hard bottom, the Commission required the applicant to pay a hard bottom mitigation fee, to be used by the California Department of Fish and Game ("CDFG") to build new or augment existing artificial reefs in the Southern California Bight. The amount of the fee was based on the total amount of square feet of hard bottom habitat affected multiplied by the CDFG's estimate of the per square foot cost to construct a new reef. Use of the "Hard Bottom Mitigation Fund" for artificial reef projects is governed by the terms of a Memorandum of Agreement between the CDFG and the Coastal Commission.

Unfortunately, CDFG is no longer accepting payments of hard bottom mitigation fees into the Hard Bottom Mitigation Fund, and so payment into the fund is unavailable to MBARI to mitigate or compensate for the hard bottom impacts caused by this project. Instead, MBARI is offering to use its ocean imaging technology to survey a section of the seafloor near the project site for the purpose of locating and mapping derelict fishing gear that can eventually be removed from the seafloor. Millions of derelict nets, fishing lines, lobster traps and crab pots litter the world's oceans. Derelict fishing gear is likely found in the water along the entire coast of California. It commonly gets caught on rocky hard substrate. The gear is potentially hazardous to divers and an array of wildlife including seabirds, turtles, sea otters, and other marine mammals. Derelict gear affects the marine environment in several ways: it can continue to "catch" marine animals, which become enmeshed or trapped, and it can damage the habitat upon which it becomes entangled or upon which it rests. It is also a visual blight on the seafloor, diminishing the natural aesthetic quality of the seafloor and rocky reef habitat. The data gathered by MBARI can then be used by federal, State, local and non-profit agencies to recover identified derelict fishing gear, thereby providing an ocean seafloor benefit by removing a human, wildlife, and habitat hazard.

In June 2005, the California Coastal Conservancy voted to allocate up to \$300,000 of ocean protection funds to support the UC-Davis SeaDoc Society's California Derelict Fishing Gear Removal Pilot Project. The SeaDoc Society is a university-based marine science program focused on improving the health of marine wildlife and ecosystems in California and Washington. For the California Derelict Fishing Gear Removal Pilot Project, the SeaDoc Society

will target portions of four coastal counties in California: Humboldt, Monterey, San Luis Obispo, and Los Angeles counties. The Commission staff conferred with the SeaDoc Society and CDFG to identify a section of seafloor for MBARI to survey that would complement the current work of the SeaDoc Society's gear removal program. With the SeaDoc Society and the CDFG's assistance, MBARI and Commission staff identified a 7-square-kilometer area slightly more than one mile from shore northwest of Moss Landing at water depths of about 30 meters (See Exhibit 4). The survey results will then be made available to the SeaDoc Society, the Monterey Bay National Marine Sanctuary, the CDFG, and others. Specially trained divers typically remove the derelict fishing gear.

Specifically, MBARI proposes to use an autonomous underwater vehicle ("AUV") instrumented with a state-of-the-art, high-resolution sidescan (410 kHz) and multibeam sonar. Sidescan sonar uses acoustic backscatter to image seafloor topography and texture. A 410 kHz sidescan is capable of imaging subtle seafloor features only a few centimeters high. Within one year of offshore cable installation, MBARI has committed to complete the survey and submit its results to the Coastal Commission. Within 60 days of completing the survey, MBARI will process the data and provide: (a) a summary report; (b) survey coverage maps; (c) spreadsheets of target locations, including a target² identification number, date that the target was imaged, latitude and longitude of the target, and depth; and (d) seafloor imagery data in a format that is commonly used by most mapping software programs.

4.5.2.3 Soft Bottom Impacts

Soft bottom areas are unconsolidated sediments (*e.g.*, gravel, coarse-grained and mixed sediments, sand, and mud) that provide habitat to epifaunal (surface living) and infaunal (below-surface living) organisms. Impacts to epifauna and infauna due to the proposed project are of concern because: (1) the proposed burial of cable will disturb their seafloor habitat; (2) many infaunal organisms have limited mobility and cannot easily escape habitat disturbance or rapidly repopulate regions of disturbance; and (3) they are a source of food for mobile epifaunal and pelagic marine organisms such as crabs, fin fish, and marine mammals.

Infaunal species collected in soft-bottom habitats, representing the principle substrate type where full cable burial is feasible, were characterized during recent studies by MBARI (2004). These studies documented polychaete worms as the infaunal group with highest abundance. Gammarid amphipods were relatively abundant. Other relatively abundant invertebrates included bivalves, nemertean worms, ostracods, and ophiuroids. ROV studies conducted by MBARI (2004) documented gastropods as the most abundant group on the sand substrate. Anemones were observed at most stations, as were crabs and seastars. Seapens were the most abundant and species rich group along the proposed cable route.

Cable grapnel, burial, post-lay burial, and repair operations, and vessel anchoring in soft-bottom areas will cause localized, temporary disturbance of the habitat and mortality to resident infaunal and slow-moving epifaunal species. In order to bury the cable to the target depth of 1.0-meter within the seafloor, divers with a hand-jet, seaplow, and ROV will be used. An ROV equipped

² A "target" is defined as any discrete 3-dimensional structure imaged on the seafloor detectable at the survey equipment's minimum detection limits.

with sediment jets will re-bury any cable segments that are not initially buried to 1.0-meter. Repair operations in the nearshore and adjacent to hard bottom areas will require an ROV to jet the damaged section from the seafloor, assuming it is buried. During periodic surveying of the cable routes, as required by **Special Condition 7**, any cable segments that have become exposed will be reburied with an ROV jet pursuant to an approved re-burial plan.

Depending on soil conditions, burying the cable could form sidecast berms of 3.3 feet (1 m) to 6.6 feet (2 m) in width. Disturbance to soft bottom habitat will be short term and minor in extent (relative to the amount of ocean soft bottom habitat). No species of special concern are known to occur in the soft bottom area, and recolonization and recovery of these soft bottom communities is typically rapid. Therefore, no long-term adverse impacts to soft bottom habitats will result from the proposed project.

4.5.2.4 Marine Water Quality

The cable is to be laid in open coastal waters off of Moss Landing, within the Monterey Bay National Marine Sanctuary (MBNMS). In general, water quality within the MBNMS is considered to be very good because of periodic upwelling and regular mixing with open ocean water masses that results in well mixed, biologically productive, and well-oxygenated water. Nearshore portions of Monterey Bay are affected by river and creek discharges and runoff. In particular, water quality near Moss Landing is affected locally by freshwater flow from the Salinas River. Agricultural drainage associated with river discharge has been a primary source of pesticide deposition in Monterey Bay (NOAA 1992).

The principal potential impacts on marine water quality due to the proposed project are: (1) impacts to filter-feeding benthic organisms due to increased turbidity during cable installation (including grapnel, burial, re-burial, repair, and jetting operations) and the suspension and resettling of contaminated sediments within Monterey Bay; (2) impacts on benthic habitat and water quality due to potential release of the drilling fluid bentonite if a "frac-out" occurs during HDD operations; and (3) the release of sewage and bilge/ballast water from project vessels. These are addressed below.

Turbidity Increases Due To Cable Installation and Conduit Cleaning and Jetting

Cable installation activities will re-suspend bottom sediments and create a plume with elevated particle concentrations and increased turbidity levels compared to surrounding waters. The size of the plume and specific suspended particle concentrations within the plume would vary depending on the grain size of bottom sediments, rates at which the suspended particles settle to the bottom or are dispersed by bottom currents, and the energy produced by the trenching equipment. Regardless, the plume diameter would not exceed tens of meters, and it would not be expected to affect adjacent areas at distances from the cable route greater than the water depths. Plume duration at any one location would be temporary (several hours), although plume formation and dissipation would occur simultaneously as long as the installation process continued (expected to last for up to 14 days). Turbidity would also be confined to near-bottom water. Once installed, the buried cable would not result in any subsequent alterations in suspended sediment or turbidity levels.

Contaminated Sediment Re-suspension

Pesticide dispersal was specifically studied in this area, with DDT and its residues (DDTr) being in the highest concentrations of all pesticides in the sediments in Monterey Bay and the adjacent ocean floor (Paull et al., 2002). DDTr are fixed absorbed into the organic matter in the fine-grained sediments. Thus DDTr travels with the sediments, and DDTr are found on essentially all fine-grained sediments that have washed off the agricultural fields and accumulated in the offshore region since 1945. A plume of DDTr-bearing sediment extends over 300 km out to sea. Thus, MBARI anticipates that there will be on the order of 14 ppb DDTr in the rapidly accumulating fine-grained sediments that will be encountered over much of the continental shelf (<100 m water depths). Nominal DDTr concentrations are anticipated to occur in the sediments on the crest of Smooth Ridge, largely because these sediments are older and accumulated prior to the development of DDT.

Regular deposition of these sediments into the bay (at much higher DDTr concentrations) occurs through agricultural runoff and subsequent drainage of the Salinas and Pajaro River valleys. Concentrations of DDTr in the area harbors, including Moss Landing Harbor, averaged 68 ppb. This level drops off significantly to the 14 ppb mentioned above in the sediments over the continental shelf. To put this in perspective, samples from produce (which is sold for consumption) grown in fields previously sprayed with DDT, still contain DDTr. Spinach samples contained concentrations as high as 300 ppb. Additionally, high-density sediment flows and dredging materials from the Moss Landing Harbor contribute far greater concentrations than that which may be temporarily stirred up in sediments as a result of cable laying activities.

Re-suspension of contaminated sediments may also impact benthic invertebrates in the project area. However, when re-suspended sediments resettle on the seafloor, the incremental change in contaminant concentrations is likely to be small. Therefore, while impacts to benthic invertebrates due to re-suspension of contaminated sediments could occur, the diluted nature of resettling contaminants will not cause adverse impacts in the long term.

Horizontal Directional Drilling and Bentonite

Conduit installation will require the use of bentonite as a drilling lubricant. Bentonite will be mixed with water and circulated into the borehole to prevent it from caving in and to coat the wall of the hole in order to minimize fluid losses to permeable formations. Bentonite (sodium montmorillonite), a natural clay, is inert and non-toxic, though it can cause adverse impacts to aquatic organisms by physical abrasion, clogging, or smothering when released in significant quantities. Bentonite may contain elevated concentrations of barium and other metals that are present as trace impurities in clay. However, these metals are in the form of insoluble salts and thus do not readily dissolve in seawater and are not biologically available.

During conduit drilling beneath the onshore landing and seafloor, a release of bentonite may occur if geologic fractures within a formation are encountered (further discussed in Section 4.5.5). If a fracture is lateral and subterranean, lost fluids will not surface, but if a fracture is close to the seafloor surface or is aligned in a vertical or uplifted fashion, high drilling pressures may force the release of drilling fluids to the surface. Despite this risk, drilling through fractures

has been a common occurrence in previous fiber optic cable projects permitted by the Commission (e.g., MCI WorldCom/MFS Globenet (E-99-011), PC/PAC (E-98-027), AT&T Japan-U.S. (E-00-004), and Global West (E-00-08). Of these projects, all experienced a "frac-out" or a loss of drilling fluid returns during offshore HDD operations, except the AT&T Japan-U.S. project. However, there are feasible measures available to prevent or minimize the risk of a "frac-out" or drilling fluid release.

The primary methods for prevention of release of drilling fluid into the marine environment are to: (1) drill in geologic strata that contain few fractures and are least susceptible to "frac-outs"; (2) carefully monitor the level and pressure of drilling fluid and stop drilling when these levels fall below prescribed minimum values (to seal and grout fractures); and (3) replace drilling fluid with water whenever conditions permit, especially as the drill bit is brought up to the seafloor at the end of the bore.

With regard to the first method of prevention, the Commission staff geologist believes that the proposed HDD bore trajectory approximately 56 feet under the seafloor is adequate given site-specific geotechnical characteristics. Sub-bottom profiling of the subsurface geological characteristics of the formation under the harbor entrance indicated that the area along the proposed HDD route is composed primarily of sand and gravel and that no faults or fractures are present. The proposed HDD alignment would be located under a lens of sedimentary soil ranging from 6.6 feet (2 m) to 13.2 feet (4 m) in thickness. The proposed HDD alignment would travel through weakly consolidated sands or unconsolidated sands and gravels. It is possible that, in the event of drilling fluid release, some of the drilling fluids would never reach the surface given the relatively permeable and absorptive substrate type. In addition, drilling at 56 feet under the seafloor, where the substrate has a lower porosity and greater overburden pressure, should help contain drilling fluids.

In its Drilling Fluid Release Monitoring Plan for Horizontal Directional Drilling (hereinafter referred to as "Drilling Plan"), MBARI proposes to continuously monitor drilling fluid returns and pressure to detect fluid loss in order to avoid or minimize potential "frac-outs" and releases of bentonite to the marine environment. If a loss of fluid volume or pressure is detected, drilling will be stopped or slowed to allow close observation for a surface release to the ocean. If a release is discovered, MBARI will take measures to reduce the quantity of fluid released by reducing drilling fluid pressures and/or thickening the drilling fluid in order to attempt to seal the fracture causing the release.

The Commission has identified some additional measures that, if implemented, would assist in the ability of MBARI to detect and minimize the volume of a release of bentonite and to respond adequately to a spill if one occurs. The Commission is therefore requiring in **Special Condition 14** that MBARI revise for Executive Director review and approval its Drilling Plan to include the following additional elements: (1) use of water to lubricate the final three drill stems or pipes (approximately 100 feet) of the borehole; (2) back-flushing of residual drilling fluids with water prior to surfacing of the borehole on the seafloor, using equipment that is free of all hydrocarbons and associated contaminants (e.g., gasoline, crude, toluene, BTEX, and other HC products) for any conduit flushing; (3) use of the fluorescent dye rhodamine added to the drilling fluid together with a fluorometer (a dye detector) to identify any drilling fluids released into

water; (4) use of side-scan sonar to assist in drilling release detection if the fluorometer detects a drilling fluid release; (5) visual monitoring and inspection onshore and offshore (by boat and with divers recording suspected releases on videotape); and (6) a set of contingency and response measures, including identification of a reasonable worst-case spill scenario, a list of spill response equipment to be kept onboard that is sufficient to respond to the identified worst-case spill scenario, an agency notification (call down list), and MSDS sheets for all chemicals/materials used in HDD.

If offshore monitoring is not possible due to sea or weather conditions, MBARI may continue to drill through the surf zone (the area between the outermost breaker and the limit of wave uprush) according to the procedures of Drilling Plan. However, MBARI shall not drill beyond the surf zone until sea conditions allow for offshore monitoring as described in the approved revised Drilling Plan.

Marine Vessel Discharge

Discharge of sewage or bilge/ballast water could result from marine vessels. Federal and state regulations prohibit the discharge of sewage waste and other sanitary wastes that disperse rapidly in the water column. Resultant water quality impacts would primarily consist of an increase in organic suspended solids and the associated biological oxygen demand. Discharge of bilge or ballast water could result in the introduction of non-native species into the local marine ecosystem.

In response to the above concerns, **Special Condition 9** requires there to be no marine discharge of sewage, bilge or ballast water, or debris from vessels either installing or repairing project cables. MBARI has also committed in its consistency certification to carry out all requirements of Special Condition 9 in federal waters.

As noted in Section 4.4.2, MBARI has applied for a 401 Certification from the Regional Water Quality Control Board and is awaiting the issuance of a 401 Certification. **Special Condition 19** requires that before issuance of this permit, MBARI must submit to the Executive Director evidence that the Regional Water Quality Control Board has approved a 401 Certification for the proposed project.

With the above-described prevention and response measures in place, the Commission finds that water quality will be protected, as required by §30231 of the Coastal Act.

4.5.2.5 Conclusion - Marine Resources and Water Quality

No other sensitive plant species (e.g., attached kelp beds or eelgrass), pinniped haulout areas, bird habitat, or other sensitive resource areas occur in or near the proposed offshore cable routes or adjacent to the proposed landing. Based on the above discussion, the Commission finds that the proposed project, as conditioned by Special Conditions 4, 7, 9-14, 17, 19 and 20, in combination with the measures agreed to by MBARI in federal waters, will be carried out in a manner that maintains marine resources and sustains the biological productivity and quality of coastal waters and is therefore consistent with Coastal Act §30230 and 30231.

4.5.3 Oil Spills

Coastal Act §30232 states:

“Protection against the spillage of crude oil, gas, petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.”

MBARI will use the construction vessel, Maersk Defender, to lay the cable in marine waters. There is a very small risk of an oil spill from the fuel tanks (which carry bunker C oil) in the event the vessel hit a subsea navigational hazard or has a collision with another vessel. During the project operations, MBARI will undertake the following mitigation measures to reduce the risk of a spill and to minimize the impacts of an accidental spill.

While cable is laid and buried, the vessels will proceed along a predetermined, linear route, at a slow speed of no more than 2.0 knots. MBARI has estimated that the total installation time for cable laying will be 5 to 6 days; however, weather conditions and other difficulties could increase the time needed to complete the installation. An installation timeframe of a total of 10 to 14 days is assumed for completion of all cable laying activities. Therefore, cable laying activities occurring within the State-waters portion of the proposed project are expected to last for no more than 1 to 2 days under ideal conditions, and no more than approximately 3 or 4 days if poor weather conditions or other difficulties slow the installation activities. Cable laying activities would occur continuously for 24 hours per day during this period. The opportunity for vessel collision is remote. The vessel is also equipped with GPS and other navigation systems, to further reduce the chances of a collision. To avoid subsurface navigation hazards, MBARI conducted a seafloor survey to select an appropriate route that avoids high-relief rocky areas.

The first test of Coastal Act Section 30232 requires an applicant to undertake measures to prevent an oil spill from occurring. To minimize the chance of a vessel collision, **Special Condition 16** requires that during offshore cable installation activities, MBARI shall make daily radio broadcast announcements on the local fishers' emergency radio frequency that provide the current cable installation location and a toll-free number that can be called for additional information.

In addition, MBARI shall post notice at least 15 days in advance of cable laying operations, in the local U.S. Coast Guard district's Notice to Mariners, about the pending cable laying operations to ensure that mariners on commercial, recreational and military vessels will have prior notice. This notification is to include information such as: the vessel name and radio call sign, size of vessel, schedule for project operations for specific areas, daily work hours of vessel operations, and 24-hour phone numbers for on-site project representatives. In addition, under the federal Submarine Cable Act (47 USC 21), fishing vessels and other ships must keep their equipment and vessels at the distance of one nautical mile from a vessel engaged in laying or repairing cable, or at least ¼ of a nautical mile from buoys intended to mark the position of a cable when being laid. The cable-laying vessel(s) will be well marked and well lighted during the night so that other mariners can see them.

Notwithstanding all efforts described above to avoid a collision, there is the possibility of an accident that could result in a spill. The second test of Coastal Act Section 30232 requires to applicant to provide "effective containment and clean up" in the event of an oil spill in order to provide the best achievable protection for California's coastal and marine resources.

The Maersk Defender has a Non-Tank Vessel Oil Spill Contingency Plan ("Plan") that has been approved by the California Department of Fish and Game Office of Spill Prevention and Response ("OSPR") in accordance with 14 CCR § 825.03-827.02 regulations for non-tank vessels over 300 gross tons.³ This plan describes oil spill prevention measures, response procedures to be followed in the event of a spill, and identifies the shoreline and marine resources at risk in the project area by incorporating by reference the environmental sensitive resources for the Monterey Bay region as described in the Central Coast Area Contingency Plan: Section 9974 of the USCG San Francisco Bay-Delta Area Contingency Plan, 2001.

In the event of a spill, the Maersk Defender has a contract with the National Response Corporation ("NRC") to provide on-water containment and recovery of a spill, as well as to provide shoreline protection and clean-up. NRC has been approved by OSPR as having response equipment and personnel capable and appropriate for providing open-ocean on-water oil spill recovery and shoreline protection for the Monterey Bay area. However, NRC does not have oil spill response equipment and personnel permanently located in the Monterey Bay area. The NRC equipment sites closest to the Moss Landing project area are located in the San Francisco Bay area, approximately 109-120 miles to the north and about 2-3 hours transport time under the best traffic conditions.

Therefore, in order to provide a faster response time and best achievable protection for the sensitive shoreline and marine resources of the Moss Landing and Monterey Bay area, MBARI's project description (see *Section 4.1: Project Description*) provides that NRC shall pre-stage oil spill containment boom, skimmers, boats, and people at the Moss Landing area for the duration of time that the Maersk Defender is operating within State waters. The amount of equipment and personnel shall be sufficient to contain and clean up a 2500 barrel spill and ready for deployment 24 hours a day. In this case, the pre-staging of NRC response equipment at Moss Landing satisfies Section 30232's standard for "effective containment and clean-up facilities."

Therefore, with the above measures in place, and the imposition of Special Condition 16, the Commission finds the project consistent with the requirements of Coastal Act §30232.

4.5.4 Commercial Fishing

Coastal Act §30234.5 states:

The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.

³ California Non Tank Vessel Contingency Plan for Maersk Defender (owner A.P. Muller), prepared by Corbett and Holt, OSPR # 08-05-1424, approved by OSPR May 2005.

Commercial fishing in central California has a rich cultural and economic history. The EIR/EIS notes that the 1,200 commercial vessels fishing the 5,322 square miles of the Monterey Bay National Marine Sanctuary each year represent a 40 percent decline in the number of commercial vessels fishing in this area since the early 1980s. Although the total number of fishing vessels in the area has declined, total catches have increased due to targeting of pelagic fishes such as sardine and squid. The most common fishing gear types used in the project area include trawls, long lines, trapping (crab pots), trolling, and purse seines.

California's annual commercial fishing harvest statewide is worth approximately \$550 million (5th largest in the nation), with recreational fishing worth approximately \$246 million (Weiss, 2002). In addition, secondary economic benefits of commercial and recreational fishing are substantial, and include tourism, seafood processing and the aesthetic and visitor-drawing qualities of working fishing ports. Statistics on the top commercial fish species caught within the Monterey Bay National Marine Sanctuary (MBNMS) are presented in Table 3.

Table 3. Average Annual Total Landings, Average Economic Value, and Most Common Species Landed at the Three Main Ports Within the Monterey Bay National Marine Sanctuary (MBNMS), 1981-2000

Most Common Species Landed	Fishing Port	Average Annual Total Landings (millions of pounds)	Average Annual Value (millions of dollars)
Rockfishes Chinook salmon Market squid Dungeness crab Dover sole	Santa Cruz	1.1	1.3
Pacific sardine Market squid Rockfishes Albacore Dover sole	Moss Landing	18.7	4.7
Market squid Pacific sardine Northern anchovy Rockfishes Pacific mackerel	Monterey	19.5	3.6

Source: EIR/EIS for the MARS Cabled Observatory, based on Starr et al., 2002.

The gear types with the greatest potential for interacting with cables are a bottom trawls. Fishing may still occur over the cables, whether buried or unburied, but in areas where the cable is not buried (e.g., over rocky substrates or on steep slopes), is insufficiently buried, or becomes exposed, the trawling gear may be snagged, damaged, or abandoned if a fisher is forced to cut gear. Fishing will also be temporarily precluded during cable installation and repair operations. The principal impacts to fishing due to the proposed project therefore are: (1) preclusion from the project area during cable installation and repair; (2) fishing gear-cable conflict or

entanglement; (3) and economic losses due to fishing-cable conflicts, including preclusion and gear loss.

Preclusion

Temporary economic impacts to commercial fishers may result due to preclusion during cable installation and repair. Pursuant to the federal Submarine Cable Act (47 U.S.C. 21 §24), all vessels are required to maintain a distance of at least one nautical mile from a vessel laying or repairing a cable and one-quarter mile from the buoy of a vessel intended to mark the position of a cable when being laid or out of order.⁴ Preclusion areas created by cable installation will be temporary; completion of all cable laying activities will take no longer than 10 to 14 days. Preclusion areas are in constant motion while the cables are being laid and/or buried during installation or repair, so there will be sufficient access to other fishing and boating areas in the project area.

To alert commercial fishermen to cable laying activities, MBARI will provide advanced notice to individuals licensed to fish in the project area. **Special Condition 15** requires that least 30 days prior to commencement of cable installation activities, MBARI shall use diligent good faith efforts to distribute written notification to any fisherman legally authorized to trawl in areas traversed by the cable route. MBARI shall obtain contact information for fishermen reporting catch from the project area from the California Department of Fish and Game ("CDFG"). The notification to fishermen, to be sent by certified mail and posted at the Moss Landing Harbormaster's Office and filed with the Monterey Bay Aquarium Research Institute, the Monterey Bay National Marine Sanctuary Office, and CDFG Marine Region Headquarters, shall: (a) describe the proposed project, (b) include a navigation chart overlaid with the exact coordinates of the proposed route, (c) contain a copy of all MBARI provisions dealing with entanglements, lost gear, and claims, and (d) provide MBARI's contact information.

Further, the Commission is requiring in **Special Condition 16** that during offshore cable installation activities, MBARI will make daily radio broadcast announcements on the local fishers' emergency radio frequency to provide the current cable installation location and a toll-free number that can be called for additional information.

To further minimize potential conflicts with fishing during cable repairs, **Special Condition 18** requires MBARI to provide notice in writing to the Executive Director and in a U.S. Coast Guard *Notice to Mariners* 15 days prior to any cable repair or maintenance activity, or as soon as possible for emergency repairs.

Potential Gear Entanglements

Commercial trawlers face additional impacts due to the presence of cables on the seafloor because their bottom trawls may snag cable segments that are insufficiently buried or exposed on the seafloor. Bottom trawls are designed to maintain contact with the seafloor. As they are towed

⁴ Fishermen who willfully or negligently snag and damage cables can be imprisoned or be subject a maximum fine of \$5,000 under the federal Submarine Cables Act (47 U.S.C. 21).

over the seafloor, a rope or chain that precedes the net opening startles prey off the ocean bottom and into the net. However, the size of the trawl boards used to spread the trawl net on the largest vessels is such that they would normally skim the surface of the seafloor with an estimated maximum penetration of 0.15 to 0.3 meters (6 to 12 inches) in the softest sediments (e.g., mud); in firmer sediments, the maximum penetration is approximately .06 meters (3.5 inches). Thus, the project's target cable burial depth of 1.0 meter provides a protection factor of over 300%.

Nonetheless, if trawl gear is snagged or cut and lost, fishermen would incur financial losses from abandoned gear and lost fishing time. MBARI estimates that 18 percent (5.7 miles) of the cable will be unburied due to the presence of rock outcrops or steep slopes.

One of the ways to reduce potential conflicts between fishermen and the cable is for licensed fishermen to know the specific locations of buried and unburied cable segments. To ensure that MBARI notifies the Commission and commercial fishers of the cable's location on the seafloor, **Special Condition 5** requires MBARI within 90 days of cable installation to submit to the Executive Director: (a) an as-built plan in writing (Route Position List) and on alignment or strip charts depicting bathymetry, seafloor substrates or features, seabed profile, depth of cable burial below the seafloor, cable tension, and profile of conduits; (b) an electronic as-built plan; and (c) an as-built cable plan overlaid on National Oceanic and Atmosphere Administration ("NOAA") navigation charts. The cable shall be considered installed the day after MBARI's acceptance of cable installation work as complete by the contractor. The cable's location shall be obtained by an acoustic navigation system linked to a surface differential global positioning system ("GPS"). Within 90 days of completing any cable *repair or maintenance* work, the applicant shall submit to the Executive Director and to all fishers licensed to operate within the project area updates of items "(a)-(c)" above.

In addition, **Special Condition 6** requires MBARI within 90 days of cable installation to submit to the Executive Director: (a) an operations report describing any cable post-installation activities, including routine or non-routine post-lay surveys, repair activities, and cable inspection activities; and (b) a cable installation report containing, at minimum, the following: (i) a summary of pre-lay and installation operations; (ii) an as-laid position list with definitions for acronyms, time reference and locations of course alterations, repeaters and splice boxes. The information shall include: date, time, event, latitude, longitude, depth, incremental route distance, and any route deviations; (iii) a description of cable laying and burial equipment, and cable installation methods used; (iv) navigational and slack control equipment and methods; (v) identification of any areas of cable suspension greater than 1.0 meter from the seafloor; (vi) daily vessel reports and daily operations log; (vii) any additional acoustic, sub-bottom profile or other geophysical data generated that had not been previously submitted to the Executive Director; (viii) an evaluation of the consistency of cable installation with the project description and applicable special conditions of this permit; and (ix) a description of fishing activity during the pre-lay and cable installation project phases.

The Commission is also requiring in **Special Condition 7**, that every 18 to 24 months, MBARI survey the cable route to verify that buried cable has remained buried consistent with the as-built plan required by Special Condition 6. MBARI shall complete the first survey of the cable within 18-24 months of initial cable installation. The second survey shall be completed within 18-24

months of completion of the first survey. If, based on the results of the first two surveys, there is no evidence of cable movement (i.e., buried cable remains stable) MBARI may seek a change to subsequent survey intervals through a permit amendment application and modification to the consistency certification.

Surveys are to be conducted with a remotely operated vehicle ("ROV") equipped with video and by a party approved by the Executive Director. Within 30 days of survey completion, MBARI shall submit to the Executive Director a report describing the results of the survey (including example still images) and a copy of the videotape(s) recorded during the cable survey. The videotape(s) shall include a display that identifies the date, time, position, water depth, and heading of the ROV.

If a survey shows that a segment(s) of the cable is no longer buried consistent with the as-built cable burial plan required by Special Condition 5, MBARI shall, within 30 days of survey completion, submit to the Executive Director for approval a plan to re-bury those cable segments. Upon approval of the plan by the Executive Director, MBARI shall proceed to implement the plan in accordance with the time schedule specified therein.

To ensure that navigational charts are updated and correct, **Special Condition 8** requires MBARI to submit to the National Oceanic and Atmospheric Administration ("NOAA") the following items: (a) geographic coordinates of the cable as-built plan using a Differential Geographic Positioning System ("DGPS") unit or comparable navigational equipment; and (b) MBARI's point of contact and telephone number.

With these measures in place, the Commission believes affected fishermen will have adequate information about the cable's location to minimize conflicts such as gear snags.

Measures to Reduce Fishing Conflicts and Economic Impacts

MBARI proposes to bury approximately 76% of the cable a target depth of 1.0 meter. The amount of cable burial is important, as buried cable minimizes potential gear entanglement and resultant loss experienced by fishers. Although the proposed project will not formally preclude fishing in unburied or exposed areas of cable, failure to achieve the target 1.0-meter burial depth, or significant areas of unburied cable, could create *de facto* areas of fishing preclusion, especially for trawlers. However, given the low number (approximately 5) of trawlers licensed to fish in the project area, the probability of trawl-cable conflicts is low.

Nevertheless, gear entanglements and gear loss may occur. MBARI has committed to adopting procedures to minimize the possibility of and effects of snagging the cable by commercial fishers. In its August 8, 2005 approval of General Lease—Right of Way Use for the proposed project (PRC W 25980/R12903), the State Lands Commission included Special Provision 18, to minimize potential adverse impacts to fishing. This provision requires, in part:

- MBARI shall meet once with the designated representative(s) of The Alliance of Communities for Sustainable Fisheries ("ACSF")⁵ and trawlers legally authorized to fish in the project area, before cable installation (a) to coordinate activities and avoid navigational and spatial conflicts, and (b) to discuss operational issues, such as fishing procedures to be followed in the vicinity of the cable. MBARI shall participate in a similar meeting within 3 months of MBARI's final acceptance of the project as complete, and thereafter, quarterly for the remainder of the first year of cable operation, and every 6 months during the second year, and thereafter at least once annually. The meetings shall take place at a location in Monterey County, selected by ACSF and convenient to fishers, to exchange information and to address any administrative or other issues that have arisen in connection with the cable. MBARI shall designate a Fisheries Liaison ("Liaison") to coordinate with licensed fishers for the same purposes on an ongoing basis throughout the lease term;
- MBARI shall maintain its existing, fully-staffed 24-hour telephone hotline and shall provide the hotline telephone number and the name of the Liaison, in writing, to any fisher licensed to trawl in the project area and to any other party who requests such information. MBARI shall also provide its hotline number to NOAA for inclusion in the Notice to Pilots. Should MBARI's hotline number or Liaison change, MBARI shall provide its new number. If a fisher believes he or she has snagged or damaged the cable, he or she is to immediately notify MBARI, through MBARI's 24-hour hotline, of the location of his or her vessel by Global Positioning System (GPS) coordinates at the time of the actual or suspected snag or damage. If, due to serious adverse weather conditions or other emergency conditions, the fisher is unable to immediately contact MBARI, he or she is to note the date, time and location of the actual or suspected snag, and shall thereafter provide notice to MBARI of the actual or suspected cable snag or injury as soon as the emergency conditions have abated. MBARI will immediately investigate the report and provide its findings on damage to the cable, on written request, to the fisher involved, within 10 days after MBARI obtains such findings. Such documentation shall also be made available from MBARI on request;
- If, after notice by a fisher legally authorized to trawl in the project area to MBARI on MBARI's hotline of a suspected or actual snag of, or other damage to, the cable, and if, at MBARI's discretion, the fisher immediately sacrifices trawling gear which snags the cable, MBARI will pay 100% of the actual reasonable retail replacement cost of gear comparable to the sacrificed gear, or the reasonable cost to repair any damaged gear, and the wholesale market value, at the fisher's port of destination, of any catch lost with the gear. MBARI will consult with the designated representatives of the ACSF and may consult with other licensed fisher regarding any submitted claim. MBARI is not required to pay claims unless MBARI is notified on its hotline number by the fisher within 24 hours of any actual or suspected cable snag or damage;
- MBARI's payment for damaged or sacrificed gear and lost catch is to be made as soon as possible but no later than 10 days after MBARI has been provided written documentation, including invoices or bids for the replacement cost of the gear or the reasonable cost to repair

⁵ ACSF represents trawl fishermen who are licensed to operate in the project area.

the gear, and the wholesale market value of the lost catch, with certification on a claim form that the claim for payment is being made by the owner of the sacrificed or damaged gear;

- MBARI is to release all claims against any fisher legally authorized to trawl in the project area who, while using reasonable care, snags the cable, if the fisher immediately notifies MBARI of the snag or other contact with the cable on MBARI's hotline and cuts loose his or her gear, as directed by MBARI, to prevent further damage to the cable. MBARI will also refrain from taking any administrative, legal, or other action or sanction and/or recover damages against fishers who notify MBARI of a probable snag or damage on MBARI's hotline and who are directed by MBARI to cut loose his or her gear to prevent further damage to the cable. MBARI is not required to release claims for cable damage or refrain from taking administrative or legal action against a fisher who damages the cable, unless MBARI is notified on its hotline number by the fisher within 24 hours of any actual or suspected snag or damage; and
- MBARI will agree to submit, no later than 30 days after a dispute arises, any dispute with a fisher licensed to trawl in the project area over reimbursement for lost or damaged gear or lost catch to mediation by a mediator mutually selected by the parties. The term mediator includes any individual deemed to be independent by the parties and may include, for example, a representative of a committee associated with any other West Coast cable. MBARI will pay half the costs of any mediation. If the dispute is not resolved by mediation within 30 days, MBARI will submit the dispute to binding arbitration before a single arbitrator selected by mutual agreement of the parties, or if the parties cannot agree, then selected in accordance with the California Arbitration Act then in effect (Code Civ. Proc. §1280, et seq.), with said arbitration to occur no later than 60 days after the dispute arose. The arbitrator will be authorized to award any arbitration costs and attorneys' fees incurred in the arbitration to the prevailing party in the arbitration as a part of the arbitrator's award.

MBARI has agreed to these provisions; they will be in place over the life of the cable.

In an August 4, 2005, letter from Stephen W. Pearson, an attorney representing MBARI, to ACSF, MBARI proposed some additional measures in response to outstanding concerns raised by ACSF. These include:

- A willingness to consider the formation of a Fishing Committee, not to exceed three people in size, which would meet up to four times in the first year after cable installation in Monterey County at a location selected by the ACSF. The Committee would be composed of one person selected by the ACSF, one person selected by MBARI, and one person selected by a neutral party. Thereafter, MBARI proposes the Committee meet less frequently (e.g., not more than two times during Year 2 and then annually thereafter).
- A willingness to pay an honorarium of not more than \$200 per meeting to the Committee fishing representative.

As of the date of issuance of this staff report, the Commission is not aware of a response from ACSF to MBARI's August 4, 2005, letter.

Finally, the Commission is requiring that MBARI remove the cable within 90 days of taking either the cable out of service or after the expiration of sooner termination of MBARI's lease or permit (**Special Condition 20**). As part of its consistency certification, MBARI has agreed to apply to the ACOE within the same time described in Special Condition 20 to remove the cable from federal waters.

With the above-described measures in place, in combination with Special Conditions 5-8, 15, 16, and 18, and 20 of the permit, Commission believes the project will be carried out in a manner that the economic and commercial importance of fishing activities will be protected as required by Coastal Act §30234.5. The Commission finds the project is therefore consistent with Coastal Act §30234.5.

4.5.5 Geology

Coastal Act §30253(2) states that:

New development shall:

(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

Regional Tectonics and Stratigraphy

The Monterey Bay region overlies a large mass of Cretaceous granitic rocks termed the Salinian Block. Overlying the granitic basement rock is a thick sequence of Tertiary strata, including the Miocene Monterey Formation, Santa Cruz Mudstone, and the Pliocene Purisima Formation. The San Andreas Fault System consists of many active or potentially active fault systems, including the onshore/offshore San Andreas Fault, the onshore/offshore Palo Colorado/San Gregorio Fault Zone, and the Monterey Bay Fault Zone.

The offshore Monterey Bay Fault Zone is an approximately 6-mile (10 km) wide series of generally parallel, northwest-southeast trending fault strands, ranging from less than 3 to over 9 miles (5 to 15 km) long. The fault zone bisects the Monterey Bay continental shelf and may intersect with the San Gregorio Fault in northern Monterey Bay. The proposed cable route crosses the Monterey Bay Fault Zone along the northern Monterey Bay continental shelf. Quaternary sediments covering the shelf show no evidence of disturbance or surface rupture caused by faulting in this region (Fugro 2004). The Palo-Colorado-San Gregorio Fault Zone is approximately 1 to 2 miles (2 to 3 km) wide and contains several generally parallel fault strands, which extend approximately 125 miles (200 km) from Garrapatta Beach in the south to Ano Nuevo Point north of Monterey Bay. The largest fault within this system is the San Gregorio Fault. The proposed cable route crosses the San Gregorio Fault near the upper continental slope. Earthquakes along this fault produce primarily oblique convergence and thrust motions (Begnaud and Stakes 2000; Begnaud et al., 2000; Stevenson et al., 1996).

Movement along either the Monterey Bay Fault Zone or the Palo-Colorado-San Gregorio Fault Zone could potentially damage or sever the submarine cable. However, because faulting at the proposed depth of the cable would likely occur in soft sediments, fault movement would be relatively flexible compared to harder materials. Therefore, the potential for cable rupture would be low. With respect to seismic-induced shaking, the concern is that a seismic wave may trigger a slumping event. Cable installation would not occur in soft sediments on slopes in excess of 8 degrees, thereby reducing the likelihood of slope failure. In addition, the cable would traverse any slopes generally perpendicular to the slope gradient. Any slope failures would therefore occur parallel to the direction of cable alignment, thus significantly reducing the potential for cable damage.

In the event that the cable was to break, it would not adversely affect the environment. However, temporary impacts would occur due to temporary disturbance of the seafloor during cable repairs. Geologic impacts associated with cable repair would be similar to those associated with cable installation.

Geologic Processes and the Submarine Cable

With previous fiber optic cable projects, a second significant area of concern was that proposed cable routes crossed submarine canyons, which often precluded cable burial due to hard bottom substrate conditions. In addition, some submarine canyons carry high-velocity periodic turbidity water currents that have historically been the cause of submarine cable breaks in various parts of the world. However, the proposed submarine cable route has been chosen so as to not cross submarine canyons, and the initial part of the installation of the cable from the onshore landing site will use HDD and cable will be installed 56 feet below the seafloor surface, thus avoiding problems where the cable project crosses the head of Monterey Canyon. The Commission's staff geologist therefore believes that submarine canyons are not a significant risk for cable breakage in the proposed project.

Potential Impacts Related to Horizontal Directional Drilling Activities

One of the primary geologic concerns related to the proposed project is that HDD operations could result in release of drilling fluids (bentonite) into the nearshore or marine environment. Most likely is the release of bentonite through fractured bedrock and sediments, or as a result of a "frac-out," in which the drilling bore creates fractures that extend to the seafloor as a result of drilling fluid pressures that exceed the strength of the rocks or sediments being drilled. The potential adverse marine resource and water quality impacts caused by a bentonite release into marine waters are discussed in section 4.5.2 of this report. Such inadvertent release of drilling fluid to the seafloor results from drilling through brittle, fractured and/or poorly consolidated rocks or sediments, the maintenance of too-high fluid pressures in the bore during drilling, and drilling at too shallow a depth below the seafloor.

The primary methods for prevention of release of drilling fluid into the marine environment are:

- 1) drill in geologic strata that contain few fractures and are least susceptible to "frac-out";
- 2) carefully monitor the level and pressure of drilling fluid and stop drilling when these levels

fall below prescribed minimum values (to seal and grout fractures); and 3) replace drilling fluid with water whenever conditions permit, especially as the drill bit is brought up to the seafloor at the end of the bore.

With regard to the first method of prevention, the Commission's staff geologist has concluded that the proposed HDD bore trajectory approximately 56 feet under the seafloor is adequate given site-specific geotechnical characteristics. Sub-bottom profiling of the subsurface geological characteristics of the formation under the harbor entrance indicated that the area along the proposed HDD route is composed primarily of sand and gravel and that no faults or fractures are present. The proposed HDD alignment would be located under a lens of relatively impermeable sediments ranging from 6.6 feet (2 m) to 13.2 feet (4 m) in thickness. The proposed HDD alignment would travel through weakly consolidated sands or unconsolidated sands and gravels. It is possible that, in the event of drilling fluid release, some of the drilling fluids would never reach the surface given the relatively permeable and absorptive substrate type.

As discussed in the Water Quality section of this report (Section 4.5.2.4) MBARI has prepared a Drilling Fluid Release Monitoring Plan for Horizontal Directional Drilling. That plan, in part, addresses measures MBARI will implement during HDD activities to minimize the risk of a "frac-out" occurring. MBARI will, for example, continuously monitor drilling fluid returns and pressure to detect fluid loss in order to avoid or minimize potential "frac-outs" and releases of bentonite to the marine environment. If a loss of fluid volume or pressure is detected, drilling will be stopped or slowed to allow close observation for a surface release to the ocean. If a release is discovered, MBARI will take measures to reduce the quantity of fluid released by reducing drilling fluid pressures and/or thickening the drilling fluid in order to attempt to seal the fracture causing the release.

For the reasons described above, the Commission finds the proposed project will not contribute to "structural instability" and is therefore consistent with §30253(2) of the Coastal Act.

4.5.6 Public Access and Recreation

Coastal Act §30211 states that:

Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Coastal Act §30220 states:

Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

Currently, the public can access the shoreline at the northern end of Sandholdt Road and on the north side of harbor at Moss Landing State Beach. The proposed project will not interfere with the public's ability to access the shoreline in this area. All horizontal directional drilling

("HDD") activities will be contained within an existing fence line on MBARI property. Public parking will not be impacted.

Offshore project activities may result in short-term disruption to recreational boaters. During marine cable installation, recreational fishers and other boaters must avoid the cable installation ship. Pursuant to the federal Submarine Cable Act (47 U.S.C. 21), a vessel must keep a distance of at least one nautical mile from a vessel engaged in laying or repairing a cable and at least ¼ of a mile from buoys intended to mark the position of a cable when it is being laid. Therefore, the project may cause recreational vessels to change their course. However, the preclusion zones created by cable installation and repair activities will be temporary or in constant motion as the cable is being laid and/or buried so there will be sufficient access to other fishing and boating areas in the project area. Moreover, once the cable is laid, full access will be restored. Because of the short-term nature of the preclusion zones, the disruption of recreational fishing and boating is not significant. Noise from cable laying activities is also not expected to have an impact on any recreational divers near the project area, because preclusion zones would prevent divers from entering into any areas with dangerous noise levels.

At least two weeks before commencement of cable laying activities, MBARI will file an advisory of pending offshore construction operations (including all vessel activities, work locations, schedules, name and radio call signs of all working vessels) with the local U.S. Coast Guard district office for publication in the local *Notice to Mariners*. MBARI will provide this same information to the County of Monterey, and the Coastal Commission. In addition, to further minimize potential conflicts with recreational fishing and boating over the life of the cable, the Commission is requiring in **Special Condition 18** that MBARI provide notice in writing to the Executive Director and in a U.S. Coast Guard *Notice to Mariners* 15 days before any cable repair or maintenance activities, or as soon as possible for emergency repairs.

With these measures in place, the Commission believes that any project-related impacts to divers, recreational fishers and other boaters will be minimal and therefore finds the project consistent with Coastal Act §30211 and §30220.

4.5.7 Cultural Resources

Coastal Act §30244 states:

Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

Historic and cultural resources are places or objects that possess historical, cultural, archaeological or paleontological significance and include sites, structures, or objects significantly associated with, or representative of earlier people, cultures and human activities and events. Of concern here is the potential for project-related activities to disturb or damage Native American artifacts and shipwrecks of potential cultural resources value. Disturbance of surface and subsurface soils could directly destroy a previously unrecorded historic or

archaeological resource, or disrupt the site such that the historic or archaeological context of the resource is altered adversely.

Side-scan sonar and sub-bottom profile surveys of a 3,280-foot (1,000-meter) wide corridor within which the cable would be laid were conducted, and no shipwrecks have been recorded near the cable route. The closest shipwreck identified in the geophysical survey data is located approximately 850 feet (260 m) northeast of the route. No other cultural resources were identified in the survey data, but the surveys did not include the deployment of a magnetometer, which would indicate the presence of ferrous-based materials that could be associated with historic cultural deposits. However, the EIR/EIS concludes that there will be no impacts to potential cultural resources in the project area, because sediment in the first 25 miles (39 km) of the project area accumulates at the rate of approximately 3.9 mm/year. At this rate, over a 100-year period, approximately 40 cm (1.3 feet) of sediment has accumulated in this segment of the proposed cable route. Over a 300-year period, approximately 4 feet (1.2 m) of sediment has accumulated over this area. The cable in this part of the project area would be buried to a maximum depth of 3.3 feet (1 m), and would not impact any potential cultural resources located along this portion of the proposed cable route. For the remaining portion of the cable route, the cable would either be buried in sediments less than 1 meter thick, or would not be buried at all and would lie on exposed cemented clay or rocky substrate, and therefore is not expected to impact any cultural resources.

In August 12, 2005 letters to various interested parties, the Monterey Bay National Marine Sanctuary stated it will require that in the unlikely event prehistoric cultural remains are identified during cable laying that construction activity will be temporarily suspended until a qualified archaeologist and appropriate tribal representative(s) have evaluated the significance of the find and recommend any necessary treatment.

Accordingly, the Commission finds that (a) it is unlikely a cultural resource will be encountered in the project area, and (b) if one is encountered, cable laying will cease and measures will be implemented to avoid affecting the cultural resource. The Commission therefore finds the project consistent with Coastal Act §30244.

4.5.8 Air Quality

Coastal Act §30253(3) states:

New development shall:

(3) Be consistent with the requirements imposed by an air pollution control district or the State Air Resources Control Board as to each particular development.

For regulatory purposes, air pollutants are generally recognized as "criteria pollutants" or as toxic air pollutants. Criteria pollutants include carbon monoxide ("CO"), nitrogen oxide ("NO_x"), sulfur dioxide ("SO₂"), particulate matter with a diameter of up to 10 microns ("PM₁₀") lead and sulfates. Toxic air pollutants are those known or suspected to cause cancer, genetic mutations, birth defects, and other serious illness to people. Reactive and volatile organic compounds

("VOCs") are also of concern because of their role in forming ozone, a secondary pollutant. The U.S. Environmental Protection Agency and California Air Resources Board establish federal and State pollutant standards, respectively.

The Monterey Bay Unified Air Pollution Control District ("MBUAPCD") is responsible for implementing federal and state air quality standards in the project area. To attain the State and federal standards, the MBUAPCD has developed emission thresholds to determine the significance of proposed emissions under the California Environmental Quality Act ("CEQA"). However, the MBUAPCD will not require a permit for offshore cable laying activities because marine vessels used during cable installation are not subject to MBUAPCD permitting requirements, which normally only apply to installation and operation of permanent stationary sources. HDD activities initiated from the onshore site will require MBUAPCD permits, but the staging area for HDD is located within the County of Monterey's coastal permitting jurisdiction and will be addressed through the County's CDP process.

The EIR/EIS nevertheless concludes that offshore cable installation activities could temporarily exceed daily emission thresholds for ozone precursors and particulate matter. The California State Lands Commission is requiring MBARI to use on-road (low emission) diesel fuel in all smaller diesel-powered vessels and in all construction equipment. In addition, MBARI is to contribute, as determined by the MBUAPCD, to an off-site emission reduction program within the MBUAPCD jurisdiction. The EIR/EIS concludes that implementation of these measures will result in a reduction of air quality impacts to less than significant levels. The Commission therefore finds that the proposed project will be carried out consistent with the rules and requirements of the local air district and therefore is consistent with Coastal Act §30253(3).

4.6 California Environmental Quality Act

On August 8, 2005, the California State Lands Commission, as "lead agency" under the California Environmental Quality Act ("CEQA"), certified an environmental impact report ("EIR") and approved a lease for the proposed project.

The Commission's permit process has also been designated by the State Resources Agency as the functional equivalent of the CEQA environmental impact review process. Pursuant to section 21080.5(d)(2)(A) of the CEQA and section 15252(b)(1) of Title 14, California Code of Regulations (CCR), the Commission may not approve a development project "if there are feasible alternatives or feasible mitigation measures available which would substantially lessen any significant adverse impact which the activity may have on the environment." The Commission finds that only as conditioned are there no feasible less environmentally damaging alternatives or additional feasible mitigation measures that would substantially lessen any significant adverse impact which the activity may have upon the environment, other than those identified herein. Therefore, the Commission finds that the project as fully conditioned is consistent with the provisions of the CEQA.

APPENDIX A: SUBSTANTIVE FILE DOCUMENTS

Coastal Development Permit Application Materials

Application for Coastal Development Permit E-05-007 dated June 6, 2005, as amended by letters and submittals dated July 7, 2005, July 11, 2005, July 14, 2005, August 22, 2005, and August 29, 2005.

Aspen Environmental Group for the California State Lands Commission and Monterey Bay National Marine Sanctuary. *Draft and Final Environmental Impact Reports/Environmental Impact Statements for the Monterey Accelerated Research System Cabled Observatory*, March 2005 and July 2005, State Clearinghouse No. 2004051138, certified by the State Lands Commission on August 8, 2005.

Begnaud, M. L., K. C McNally, D. S. Stakes and V.A. Gallardo, 2000. *A Crustal Velocity Model for Locating Earthquakes in Monterey Bay, California*, Bulletin of the Seismological Society of America, 90(6)1391-1408.

Begnaud, M. L., and D.S. Stakes, 2000. *Constraining Continental Margin Seismicity by Extending Onshore Seismograph Stations to Critical Offshore Site*, Bulletin of the Seismological Society of America, 90(2)414-424.

California State Lands Commission General Lease—Right of Way Use for the Monterey Accelerated Research System Cabled Observatory, File Ref. PRC W 25980/R12903, approved by the State Lands Commission on August 8, 2005.

Corbett and Holt, 2005. California Non Tank Vessel Contingency Plan for Maersk Defender (owner A.P. Muller), OSPR # 08-05-1424, approved by OSPR May 2005.

Environmental Crossings, Inc., *Drilling Fluid Monitoring and Remediation Plan for Horizontal Directional Drilling*, September 16, 2004.

Fugro Seafloor Surveys, Inc., 2004. *Monterey Accelerated Research System (MARS) Geophysical & Burial Assessment Surveys*.

Hall, D., and J. Kum, 2001. *Assessment of Deep Diving Whales Major Distribution Within the MBNMS*. <http://bonita.mbnms.nos.noaa.gov/resourcepro/reports/LFAreport/welcome.html>

Minerals Management Service, Department of the Interior. *Gray Whale Monitoring Study: Final Report*, prepared by MBC Applied Environmental Sciences, August 1989.

Monterey Bay Aquarium Research Institute (MBARI), 2001. *Monterey Accelerated Research System (MARS) Shore Landing Options and HDD Documentation*.

National Oceanic and Atmospheric Administration (NOAA), 1992. *Final Environmental Statement and Management Plan for the Proposed Monterey Bay National Marine Sanctuary*. Prepared by the Sanctuaries and Reserves Division, Office of Coastal Resource Management, National Ocean Service, National Oceanic and Atmospheric Administration, Washington D.C.

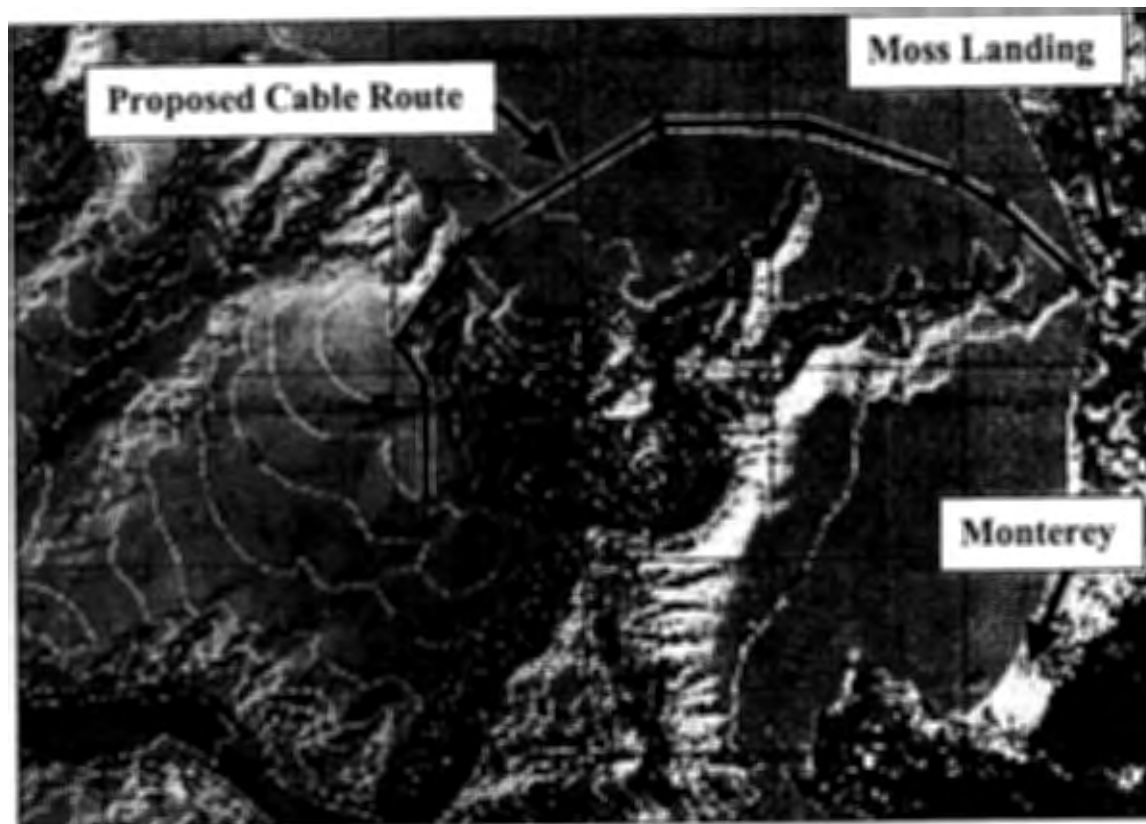
Paull, C.K., H.G. Greene, W. Ussler III, and P.J. Mitts, 2002. *Pesticides as Tracers of Sediment Transport Through Monterey Canyon*, *Geo-Mar Letters* 22:121-126.

Starr, R.M., J.M. Cope, L.A. Kerr and J. Kum, 2002. *Trends in Fisheries and Fishery Resources Associated with the Monterey Bay National Marine Sanctuary from 1981-2000*. University of California Sea Grant Extension Program Publication No. T-046.

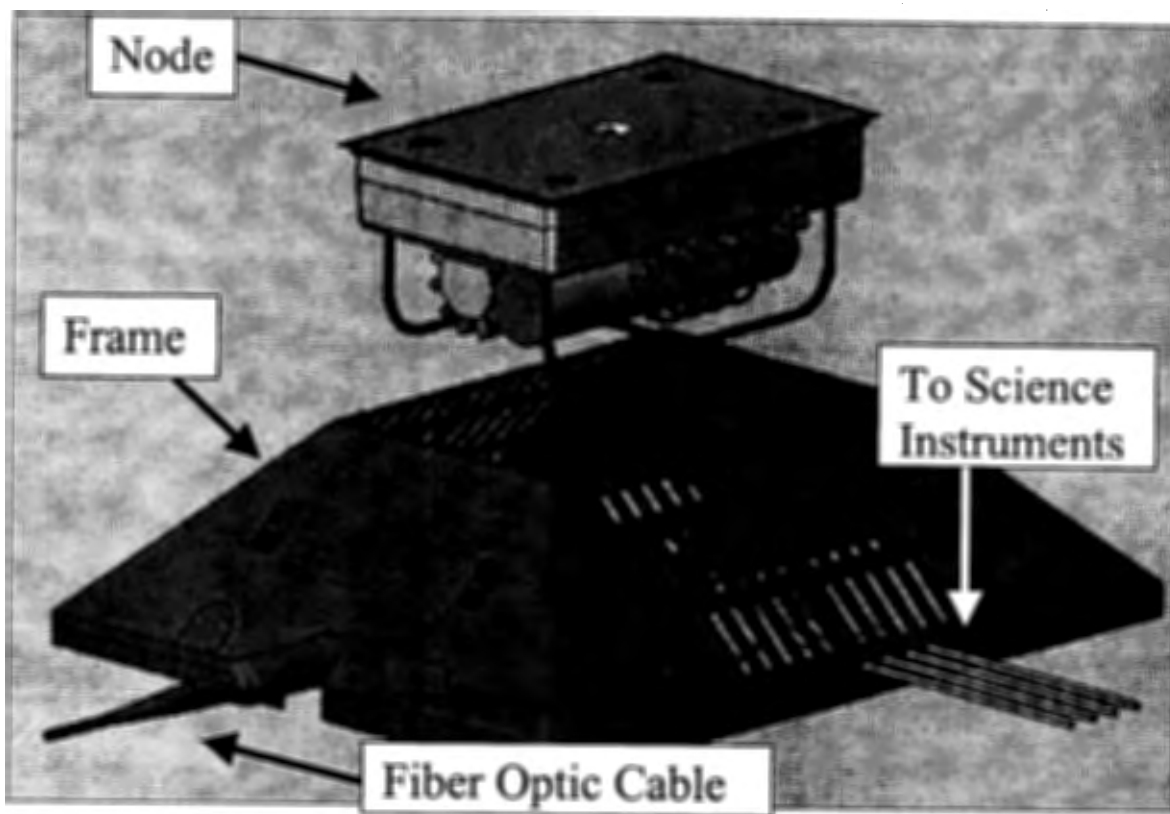
Stevenson, A.J., G.H. Greene and R. Anima, 1996. *Location and Structure of the San Gregorio Fault across the Northern Monterey Bay Shelf*, Abstract and Poster, 6th Annual Monterey Bay National Marine Sanctuary Research Symposium, Monterey, California.

United States Environmental Protection Agency, 1993. Final Environmental Impact Statement (EIS) for Designation of a Deep Water Ocean Dredged Material Disposal Site off San Francisco, California. Prepared by Science Applications International Corporation for the U.S. Environmental Protection Agency, Region IX, San Francisco.

Weiss, Kenneth, June 21, 2002. Los Angeles Times: *Commercial Fishing Banned Off California*.



Area location map and proposed fiber optic cable route.



The science node will sit within the trawl-resistant frame.

**Monterey Bay Aquarium Research Institute
Monterey Accelerated Research System (MARS) Project
Draft Marine Mammal Monitoring Plan**

July 11, 2005

Prepared for:

**Monterey Bay Aquarium Research Institute
7700 Sandholdt Road
Moss Landing, California 95039**

Prepared by:

**ECOLOGY AND ENVIRONMENT, INC.
350 Sansome Street, #300
San Francisco, California 94104**

**Monterey Bay Aquarium Research Institute
Monterey Accelerated Research System (MARS) Project
Draft Marine Mammal Monitoring Plan**

July 11, 2005

Prepared by


Adrienne Fink, Ecology and Environment, Inc.

Approved by

Mandy Allen, Monterey Bay Aquarium Research Institute

Table of Contents

Section	Page
1-1 Introduction and Background	1-1
2-1 Project Description	2-1
2.1 Overview	2-1
2.2 Plowing Operations	2-3
2.3 Trawl-Resistant Node Frame Deployment	2-4
2.4 MARS Instrumentation	2-4
2.5 Horizontal Directional Drilling (HDD)	2-4
2.6 Remove Bottom-hole Assembly	2-5
2.7 Operation	2-6
2.8 Maintenance and Repairs	2-6
2.9 Decommissioning and Removal	2-7
2.10 Construction Schedule	2-7
3-1 Regulation Pertaining to Marine Mammals	3-1
3.1 The Marine Mammal Protection Act	3-1
3.2 Endangered Species Act	3-1
4-1 Marine Mammal Species of Concern	4-1
4.1 Threatened and Endangered Species of Marine Mammals	4-2
5-1 Potential Impacts	5-1
6-1 Mitigation Measures and Marine Mammal Monitoring	6-1
6.1 Marine Mammal Observers	6-1
6.2 Marine Mammal Observer Training	6-1
6.3 Marine Mammal Observer Equipment	6-2
6.4 Commencement of Cable Lay Operations	6-2
6.5 Marine Mammal Sightings	6-2
6.6 Marine Mammal Evasion Procedures	6-3
6.7 Reporting	6-3
7-1 References	7-1



List of Tables

Table		Page
4-1	Pinnipeds known to occur within the MBNMS.....	4-1
4-2	Cetaceans known to occur within the MBNMS	4-1
4-3	Fissipeds known to occur within the MBNMS.....	4-2

1

Introduction and Background

The Monterey Bay Aquarium Research Institute (MBARI) Monterey Accelerated Research System (MARS) Project includes the installation of an advanced cabled observatory in Monterey Bay that will serve as the test bed for a state-of-the-art regional ocean observatory, currently one component of the NSF Ocean Observatories Initiative (OOI). The MARS cabled observatory will use new power and communication technologies to provide a remote, continuous, long-term, high-power, large-bandwidth infrastructure for multidisciplinary, in situ exploration, observation, and experimentation in the deep sea. MARS will be located in Monterey Bay within the boundaries of the Monterey Bay National Marine Sanctuary (MBNMS).

To facilitate oceanographic data collection in Monterey Bay, a science node containing eight scientific data ports would be installed on the sea floor. Each science port would be capable of providing electrical power and data transport in support of future experiments and data collection. Extension cables could be plugged in to any science port to provide power and communications up to 2.5 miles (4km) away from the node. The submarine cable would connect the node to shore facilities and provide power and the capacity to produce real-time data return and experiment control. Shore facilities would include a 16-foot long modular building or similar structure that would house the necessary equipment and electronics that can be used by scientists as portable laboratory space.

A Draft Environment Impact Statement/Environmental Impact Report (EIS/EIR) was completed for the MBARI MARS Project in March 2005. The EIS/EIR contains a detailed description of the proposed project, purpose, and construction and operation activities.

2

Project Description

2.1 Overview

To facilitate oceanographic data collection in Monterey Bay, a science node containing eight scientific data ports would be installed on the sea floor. Each science port would be capable of providing electrical power and data transport in support of future experiments and data collection. Extension cables could be plugged in to any science port to provide power and communications up to 2.5 miles (4km) away from the node. The submarine cable would connect the node to shore facilities and provide power and the capacity to produce real-time data return and experiment control.

The Project has offshore and onshore segments and consists of a single submarine cable that would be laid between a shore station in Moss Landing and the science node that would be placed on the seabed on Smooth Ridge, approximately 31.7 miles (51 km) west-southwest of Moss Landing. The node would be located on the seabed at the end of the cable route and housed within a trawl-resistant bottom mount frame to secure it to the seabed. The trawl-resistant frame measures 14.8 feet (4.5 m) long, 11.7 feet (3.6 m) wide, and 4.2 feet (1.3 m) high, and would be deployed by the installation vessel along with the cable. The node would be deployed using a Remotely Operated Vehicle (ROV) after the trawl-resistant frame and cable have been installed.

The cable would be buried along approximately 76 percent of the route to a depth of 3.3 feet (1 m), where feasible. The cable would be buried using a hydraulically operated plow, which would be towed by a cable installation vessel. The plow would cut a narrow trench on the seafloor for the cable and bury the cable. In areas where this depth of burial is not achievable, the cable would be buried to the greatest depth possible. In areas where the cable cannot be buried with this method, the cable would be laid on the sea bottom and would be post-lay buried by jetting (a construction process that uses a high-pressure stream of water to excavate sediments) where feasible. Some portions of the cable would remain unburied due to hard seafloor substrate and exposed rocks.

The Applicant has contracted Alcatel to lay the submarine cable. The Alcatel cable vessel Ile de Ré, or other equivalent vessel, would be utilized for the cable-laying operation. The Ile de Ré is a 469-foot (143-m), dynamically positioned



2. Project Description

ocean-going cable lay and repair vessel, which enables it to maintain position without the use of anchors. The vessel has twin main engines and propellers, two rudders, and full redundancy of equipment, allowing it to hold position or to continue working even in the event of an equipment failure. The vessel can remain at sea for approximately 32 days and is capable of operating in sea and weather conditions up to Beaufort 7 (include winds between 28 to 33 knots with wave heights between 13.5 to 19.0 feet [4.1 to 5.8 m]). The vessel is also equipped with an ROV to assist cable-laying activities with a safe working depth of 8,202 feet (2,500 m). The vessel is required to comply with all national and international regulations including ballast management, disposal regulations, safety management, and U.S. Coast Guard regulations during installation of the cable.

Prior to the main lay operation, a pre-lay grapnel run (PLGR) would be conducted along the proposed cable route. The intent of the PLGR is to attempt clearance of any seabed debris, such as wires, hawsers, abandoned fishing equipment, or other debris that may occur along the proposed route. Any debris recovered during these operations would be disposed onshore upon completion of the operations and disposed in accordance with applicable regulations.

The PLGR operation involves the towing of one or an array of grapnels along the length of the route to be plowed. The vessel proceeds at a rate that ensures the grapnel(s) maintain continuous contact with the seabed. The grapnel is usually a 'sliding prong' type, which can penetrate up to 15.7 inches (40 cm) into the seabed. The grapnel is connected to the towrope or wire by means of a length of 98.4 feet (30 m) of chain with a similar length of chain following the grapnel; the chain further assists in keeping the grapnel in contact with the seabed.

As the vessel moves along the route, the towing tension is monitored and the grapnel(s) is recovered if the tension increases indicating that an obstruction has been hooked. The grapnels are routinely recovered and inspected at minimum intervals of 9.3 miles (15 km) along the route. Usually, a single tow is made along the route but, in areas where other marine activity or debris amounts are high, additional runs may be necessary.

After the PLGR procedures are completed, cable installation would begin. Plow burial would occur along sections of the route containing suitable substrate conditions identified by the route and burial assessment surveys. A burial assessment survey was conducted to establish the burial depth and the level of cable armor necessary to protect the cable. Any surface-laid section of cable would be post-lay buried by jetting. Although the Applicant proposes to bury the cable to the maximum extent practicable, due to the presence of escarpments and carbonated substrate morphologies, a portion of the cable would not be buried.

At the shore-landing site, the cable would be placed in a buried steel pipeline that would be installed by horizontal directional drill (HDD) from the shore-landing site. The cable would join the HDD pipe at a location approximately 4700 feet (1433 m) offshore at a depth of 50 feet (15.25 m). To bring the MARS cable to



2. Project Description

shore, a 5-inch (12.7-cm) diameter steel pipe would be installed underground that would extend out into Monterey Bay from the shore landing site. This pipe would serve as conduit for the MARS cable. The pipe would extend from the shore-landing site to a point on the seabed approximately 0.89 miles (1.4 km) to the northwest of the shore-landing site. The HDD exit point will be located at approximately 36° 48.75' N, 121° 48.05' W in the bay.

2.2 Plowing Operations

The plow would be deployed and recovered by means of an A-frame structure located at the stern of the vessel. A docking-frame assembly is used to minimize any excessive pendulum motion caused by vessel movement when the plow is being handled out of the water. The plow would be launched by lifting it from the working deck and moving the A-frame slowly outboard until the plow is clear of the stern; pay out would be continued until the plow is a few meters below the surface of the sea. At this stage, the plow systems would be checked prior to transferring the weight of the plow to the towline and carefully lowering the plow to the seabed. As the plow is lowered, the plow control umbilical with attached recovery line would be simultaneously paid out.

When the plow arrives on the seabed, the cable-laying vessel moves slowly forward paying out cable to maintain tension, and adjustments are made to the tow wire and umbilical line to achieve the optimum towing scope or 'layback' for the plow. While these adjustments are made, the plow remains stationary. Just prior to the start of plowing, the tow winch rendering is set to avoid excessive towing tensions.

As the plow starts to move, the plow skids would be raised (causing the share to dig deeper into the seabed) and the depressor arm would be lowered until the required burial depth is achieved. Cable would be paid out such that the cable reaches the seabed a few meters in front of the plow. This would result in minimal residual cable tension measured at the plow. During plow burial operations, there is typically a 6.6-foot (2-m)-wide area of disturbance along the installation route. The plow to be used for installation is capable of burial to 3.6 feet (1.1 m), down slopes of up to 12 degrees, and up slopes in excess of 30 degrees.

When the end of the plowed section is reached, the skids are lowered and the depressor arm is raised causing the burial depth to be reduced to a minimum. The cable-laying vessel is stopped and the towing scope is reduced while simultaneously recovering the umbilical and attached recovery line. When the plow lifts clear of the seabed, the cable-laying vessel would move ahead very slowly as the plow is raised to the surface. Lay cable is paid out to maintain appropriate tension. The plow would be held at a point just below the surface while the recovery line is attached to the lift wire, which passes over a sheave at the top of the A-frame. The plow is then raised on the recovery/lift line to engage in the docking frame. Finally, the A-frame is moved inboard, and the plow is lowered to the vessel's deck.



2. Project Description

The plow is primarily intended for use in simultaneous lay and bury operations. For simultaneous lay and burial, the lay cable touches down on the seabed ahead of the plow. As the plow moves forward, it picks the cable up off the seabed and buries it. This technique is made possible by the steering mechanism, which allows the plow to track along the cable without moving it sideways across the seabed. Cables with a low submerged weight may be laid directly into the bell mouth at the front of the plow. In this mode of operation, the plow is deployed and recovered with the lay cable passing through the plow and with the tow cable and umbilical connected. The system is diver-less in normal operation. Post-lay burial operations would require the use of an ROV or divers to load and unload the cable on the seabed.

2.3 Trawl-Resistant Node Frame Deployment

The cable would most likely be installed from the shore-landing site towards the sea. The plow would be retrieved when the main cable-laying vessel gets to within 2 km of the science node installation point. The main lay vessel would then surface lay the cable and deploy the trawl-resistant node frame on the end of a ground rope and continue surface laying the ground rope. When the trawl-resistant frame is on the seabed, an acoustic release would be activated which would part the ground rope just above the seabed.

After the cable and the trawl-resistant node frame have been deployed, the Research Vessel Point Lobos would lower the science node onto the ocean floor near the trawl-resistant node frame. An ROV would then latch onto the science node, lift it, and then lower it into the trawl-resistant node frame. The ROV would then attach the underwater mateable connectors between the node and the trawl-resistant node frame to allow the node electronics to be connected to the shore through the cable.

2.4 MARS Instrumentation

It is not possible to predict or describe all of the instrumentation that may be used on the MARS Observatory during its lifetime. Scientists and engineers would submit proposals regularly to design and test new instrumentation and data collection methods. A description of typical instrumentation currently in use as part of MBARI research within the MBNMS, and instrumentation that may be used for research and data collection in the future as part of the MARS Project, is provided in the EIS/EIR.

2.5 Horizontal Directional Drilling (HDD)

HDD would be used to install an underground conduit, consisting of a 5-inch diameter steel pipe from shore to a point below the seafloor approximately 0.89 miles (1.4 km) offshore at a depth of 50 feet (15.25 m). HDD is a highly specialized boring technique that would be used to drill an arc that would travel under Monterey Bay from the landing site to the location of the buried undersea cable. Lubrication containing water and bentonite clay, referred to as drilling mud or fluid, would be used to aid the drilling. Bentonite is a non-toxic, inert substance



2. Project Description

that provides a number of critical functions in HDD operations, including the removal of suspended solids from the borehole, cooling the drill head, and filling the annulus space in the surrounding soils. The steel conduit in which the fiber optic cable would be placed would be advanced in sections through the borehole as it is created.

Before the HDD operation begins, the entry and exit points would be established and relative elevations and drill distances surveyed and verified. During this operation, any existing subsurface obstructions in the area, including the location of all utility crossings, would be identified and marked. Where possible, the locating grid would be placed along the entry portion of the drill path to verify the position of the drill head during drilling operations. At the proposed exit point (i.e., where the HDD operation proposes to "daylight" on the seabed offshore), a marine support crew would set a buoy at the exit coordinate, and this distance would then be measured and verified. The depth of the drill path recommended by the HDD contractor is -90 feet (27 m) to -100 feet (30 m) below sea surface level. This depth would result in a drill path approximately 56 feet (17 m) below the sea floor and is intended to hinder the release of drilling mud to the surface while remaining above unknown subterranean formations that may occur at greater depths.

The proposed staging area for the HDD operation is located on the south side of the entry channel to Moss Landing Harbor near the north end of Sandholdt Road. After mobilization and preparation of the drill rig, support equipment, and verification of relevant permit requirements, HDD operations would begin. Drilling activities would be conducted 12 hours a day and continue until the bore has been completed. The Applicant anticipates HDD operations would be completed within 13.5 days.

As the drill stem approaches the exit point on the ocean floor, the drilling conditions would be monitored to determine the exact location of the drill head in relation to the exit point. The actual bore exit would be identified by the drill crew when the bottom-hole assembly is no longer supported by the soil and the angle of the drill string changes dramatically. A marine support crew would be dispatched to dive on the exit to verify the exit point. Once the exit has been verified, an on-site inspector would be given the true offshore exit coordinate for approval.

2.6 Remove Bottom-hole Assembly

Once the exit location has been approved, divers would jet down through the sediment to a point approximately 1 foot above the sea floor and cut off the drill steel at the desired depth using underwater cutting equipment. Once the pipe is cut and the end of the pipe has been de-burred to remove any sharp edges, the guidance wire would be removed and a pipe pig attached to an aircraft cable would be installed at the onshore end of the drill pipe. The pipe pig would be hydraulically pushed through the drill pipe with fresh water with the cable trailing the pig. This removes any remaining drilling fluids, proofs the pipe, verifies the



2. Project Description

inside of the pipe is clean, and provides a cable for pulling the fiber optic cable through the drill pipe. A "Tide Flex" check valve and a bell mouth would be installed on the offshore end of the drill and any extra cable would be pushed into the land portion of the drill pipe. The cable would be tied off to a cap that would be placed on the land portion of the drill pipe. A locator ball would be placed above the cap and the pipe would be buried according to specification. The locating ball would be used to relocate the pipe casing prior to installation of the fiber optic cable.

2.7 Operation

Routine operation of the Project would consist of the ongoing installation, monitoring, and removal of various types of scientific equipment and instrumentation deployed on the seabed within a 2.5-mile (4-km) radius of the science node. Equipment would be handled using ROVs and day vessels belonging to the Applicant. Research equipment and instrumentation would be attached to the ports on the science node and supplied with power and data transmission capabilities to shore. The types of equipment that would be deployed over the life of the Project cannot be accurately predicted at this time, as specific research will require the development of specific instrumentation. At any one time, multiple pieces of equipment could be connected to the science node. Schedules for installation and removal of this equipment and durations of these activities will be project dependent and cannot be predicted at this time.

2.8 Maintenance and Repairs

The communications and power electronic components are housed within the central node that can be accessed and removed without disturbing the trawl-resistant frame and buried cable. The node can be removed using the Applicant ROV's and brought to the surface and transported to the Applicants onshore facilities for maintenance as required. Inspections of the highest risk areas of the cable route would be conducted 2 years after installation and thereafter, every 5 years. High-risk areas include: near the HDD entrance pipe near shore, the unburied section on the neck of Smooth Ridge and near the node. Additionally, selected locations on the shelf will also be inspected. If the cable were found to be unburied in sections that were previously buried, the cable would be re-buried if there were a serious risk to cable damage if left unburied. Our geologists have indicated that we are in a period of sediment build up on the shelf, so it is unlikely that the cable will become unburied over its lifetime. Inspections will also be conducted if a loss of power or communications is detected to or from the node, or if fishing gear is reported lost in the cable route vicinity.

Diagnostics within the power system and other optical measurements allow for the location of specific faults along the cable route and repairs would be undertaken via the Applicants vessels. The cable will be repaired using a cable laying vessel by retrieving the damaged section with a grapnel and brining it on board the vessel without cutting the cable whenever possible. The cable will then be lowered and buried to the extent possible using a ROV jetting tool. If the repair cannot be conducted without cutting the cable, the cable will be cut, and each end



2. Project Description

brought on board the vessel for diagnostic measurements. Following any repairs, the cable would then be lowered back on to the submarine surface and buried to the extent possible using the ROV jetting tool. The repaired area would then be inspected using ROV's to determine the extent of burial achieved.

2.9 Decommissioning and Removal

It is projected that the submarine cable, node, and trawl-resistant frame will have a life expectancy of 25 years. At the end of the Projects life, the cable, node, and trawl-resistant frame will be removed. Removal activities would likely require the use of shipboard winches. Marine vessels and ROVs would be used for cable excavation, sectioning, and retrieval. Any sections of cable that were substantially encrusted or overgrown and effectively "cemented" to the bottom in hard bottom areas would be recovered to the extent possible. Cable that was laid inside conduit would be drawn from the shoreline onto a cable reel. Complete cable removal activities would require approximately 20 days.

2.10 Construction Schedule

Construction of the Project includes several components, including trenching for cable burial, installation of the cable landing pipe by HDD, and construction of onshore facilities. Installation of the cable would occur 24 hours per day and is scheduled to occur sometime between September 1 and November 15, 2005. The total estimated installation time for cable laying is approximately 10-14 days, including considerations for inclement weather.

After mobilization and preparation of the drill rig, support equipment, and verification of relevant permit requirements, HDD operations would begin. Drilling activities would be conducted 12 hours a day and continue until the bore has been completed. The Applicant anticipates HDD operations would be completed within 13.5 days.

3

Regulation Pertaining to Marine Mammals

3.1 The Marine Mammal Protection Act

The Marine Mammal Protection Act (MMPA) (16 U.S.C. 1362), subject to limited exceptions, prohibits any person or vessel subject to the jurisdiction of the United States from "taking" marine mammals in the United States or on the high seas without authorization. "Taking," which includes any harm or harassment, is defined in Section 3 of the MMPA as "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill any marine mammal. The term "harassment" means any act of pursuit, torment, or annoyance that has the potential to:

- Injure a marine mammal or marine mammal stock in the wild; or
- Disturb a marine mammal stock in the wild by causing disruption of the behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering.

Section 101(a)(5) of the MMPA directs the Secretary of the Department of Commerce to allow, upon request, the incidental (but not intentional) taking of marine mammals by US citizens who engage in a specified activity (exclusive of commercial fishing) within a specified geographical region if certain findings are made and regulations are issued. Permission may be granted by the Secretary for the incidental take of marine mammals if the taking will: (1) have a negligible impact on the species or stock(s); and (2) not have an unmitigable adverse impact on the availability of the species or stock(s) for subsistence uses. Regulations must be issued setting forth the permissible methods of taking and the requirements for monitoring, mitigating measures, and reporting such taking. Under the incidental take regulations the monitoring program must verify the nature and amount of taking by the activity is consistent with the taking authorized.

3.2 Endangered Species Act

The Endangered Species Act (ESA) provides for the listing of endangered and threatened species of plants and animals as well as the designation of critical habitat for listed animal species. The ESA prohibits the taking of any endangered species without (for federal agencies) an incidental take authorization. The definition of "taking" includes injury and harassment. The ESA also requires federal agencies to exercise their authorities, in consultation with designated agencies (in effect, the USFWS and NOAA Fisheries, as appropriate), to conserve endangered

3. Regulation Pertaining to Marine Mammals

species. It further requires federal agencies to consult with these agencies on any action that may jeopardize the continued existence of any threatened or endangered species, which has been interpreted by regulation to require consultation for any action that "may affect" such species. For actions that may adversely affect species, the regulatory agencies may recommend mitigation. Such mitigation is required if an agency action would otherwise jeopardize the species existence, and it may be required if agency action will result in a take and, therefore, require an incidental take authorization.

This EIS will serve as the basis for the development of a Biological Assessment, required under the ESA, for endangered or threatened marine and terrestrial species and their critical habitats. Upon completion of the EIS consultation with NOAA Fisheries and FWS will be initiated. Based on information in the Biological Assessment, NOAA Fisheries and FWS will provide a Biological Opinion on whether the proposed action would be likely to jeopardize the continued existence of any listed species or result in the destruction or adverse modification of critical habitat. That Biological Opinion may include an incidental take statement if the proposed action will result in any takes of listed species.

4

Marine Mammal Species of Concern

The MBNMS has one of the most diverse and abundant assemblages of marine mammals in the world, including nine federally listed threatened or endangered species. Additionally, many other marine mammal species protected under the MMPA occur in the Project area, including six species of pinnipeds, one species of fissiped, and multiple species of cetacean.

Large species of whales are typically more abundant during summer and fall months, specifically July through November. However, gray whales are the exception, usually migrating southward between December and February, and northward between February and May. Generally dolphins are present in the area year-round, but are less abundant February through July. Any state or federal listed threatened or endangered species are discussed further below.

Table 4-1 Pinnipeds known to occur within the MBNMS

Common Name	Species Name	Status
northern elephant seal	<i>Mirounga angustirostris</i>	
harbor seal	<i>Phoca vitulina</i>	
California sea lion	<i>Zalophus californianus</i>	
Steller sea lion	<i>Eumetopias jubatus</i>	FT
northern fur seal	<i>Callorhinus ursinus</i>	D
Guadalupe fur seal	<i>Arctocephalus townsendi</i>	FT, ST
northern elephant seal	<i>Mirounga angustirostris</i>	

Source: MBNMS, 2005, <http://bonita.mbnms.nos.noaa.gov/research/techreports/trmarinemammal.html>

Table 4-2 Cetaceans known to occur within the MBNMS

Common Name	Species Name	Status
blue whale	<i>Balaenoptera musculus</i>	FE
fin whale	<i>Balaenoptera physalus</i>	FE
sei whale	<i>Balaenoptera borealis</i>	FE
minke whale	<i>Balaenoptera acutorostrata</i>	
Humpback whale	<i>Megaptera novaeangliae</i>	FE
California gray whale	<i>Eschrichtius robustus</i>	

**4. Marine Mammal Species of Concern****Table 4-2 Cetaceans known to occur within the MBNMS**

Common Name	Species Name	Status
Northern Pacific right whale	<i>Eubalaena glacialis</i>	FE
sperm whale	<i>Physeter macrocephalus</i>	FE
pygmy sperm whale	<i>Kogia breviceps</i>	
dwarf sperm whale	<i>Kogia simus</i>	
Baird's beaked whale	<i>Berardius bairdi</i>	
Cuvier's beaked whale	<i>Ziphius cavirostris</i>	
Hubbs' beaked whale	<i>Mesoplodon carlhubbsi</i>	
short-finned pilot whale	<i>Globicephala macrorhynchus</i>	
killer whale	<i>Orcinus orca</i>	
false killer whale	<i>Pseudorca crassidens</i>	
Pacific white-sided dolphin	<i>Lagenorhynchus obliquidens</i>	
northern right whale dolphin	<i>Lissodelphis borealis</i>	
Risso's dolphin	<i>Grampus griseus</i>	
short-beaked common dolphin	<i>Delphinus delphinus</i>	
long-beaked common dolphin	<i>Delphinus capensis</i>	
Bottlenose dolphin	<i>Tursiops truncatus</i>	
striped dolphin	<i>Stenella coeruleoalba</i>	
Dall's porpoise	<i>Phocoenoides dalli</i>	
harbor porpoise	<i>Phocoena phocoena</i>	

Source: MBNMS, 2005, <http://bonita.mbnms.nos.noaa.gov/research/techreports/trmarinemammal.html>**Table 4-3 Fissipeds known to occur within the MBNMS**

Common Name	Species Name	Status
southern sea otter	<i>Enhydra lutris</i>	FT

Source: MBNMS, 2005, <http://bonita.mbnms.nos.noaa.gov/research/techreports/trmarinemammal.html>**4.1 Threatened and Endangered Species of Marine Mammals****Blue Whale**

Blue whales may move along the entire California coastline during fall searching for euphausiid prey. Euphausiid swarms are often seen in great concentrations in Monterey Bay and blue whales have been observed feeding on dense swarms near Monterey and the Farallones. Blue whale are a federal endangered species.

Fin Whale

Fin whales are federally listed as endangered, but were once one of the most abundant of the large whales. Current counts suggest that a mere 80,000 animals remain worldwide with between fifty and several hundred in the MBNMS. Fin



4. Marine Mammal Species of Concern

whales within the MBNMS range throughout the boundaries from April through September and commonly feed on krill associated with upwelling at the boundaries of offshore currents.

Sei Whale

Sei whales are a federal endangered species. They occur only rarely in California waters, with estimates of only 56 individuals during surveys off the coasts of California, Oregon, and Washington (Caretta et al. 2004).

Humpback Whale

Humpback whales are a federal endangered species. They are one of the most common large baleen whales seen in the MBNMS, though California estimates are significantly lower than those for blue whales. Humpback whales are seen most frequently off central California during fall; feeding, primarily on euphausiid prey around the Farallon Islands. Most evidence indicates that the humpback whales feeding off California have moved north from areas used during winter off Mexico.

Northern Pacific Right Whale

The Northern Pacific right whale is one of the rarest mammals in the world. The three most recent sightings of the Northern Pacific right whale south of Alaska have occurred in the MBNMS, two of which occurred in the last four years. The entire region is considered to be within the whales' range. Right whales within the MBNMS range throughout the Sanctuary boundaries from October through March. Northern Pacific right whales are a federal endangered species.

Sperm Whale

Sperm whales are a federal endangered species. It is not frequently reported in the MBNMS, although it is the most abundant large whale in the eastern North Pacific. Areas of deep water, where they often are associated, are infrequently surveyed and many of the sperm whales observed are typically noted greater than 30 km from shore and in the vicinity of the MBNMS. Sperm whales do at times occur relatively close to shore in the MBNMS because of the deep water associated with the Monterey Canyon.

Stellar Sea Lion

The Stellar sea lion is a federal threatened species. In California, many were historically known to occur on Año Nuevo Island, Point Lobos State Reserve, and the Farallon Islands. Año Nuevo Island is now the southernmost breeding area for this species, and they are rarely seen at other haul-out sites in the MBNMS.

Guadalupe Fur Seal

The Guadalupe fur seal is listed as both a federal and state threatened species. It is the only pinniped listed that occurs infrequently in the MBNMS. This species breeds on Guadalupe Island off Mexico.



4. Marine Mammal Species of Concern

Southern Sea Otter

The southern sea otter is a federal threatened species that may occur along the nearshore portions of the cable route. The sea otter's broader range extends from the Gaviota Coast in Santa Barbara County to Half Moon Bay in San Mateo County. Sea otters inhabit a narrow zone of coastal waters, normally staying within one mile of shore. They are seldom found in open waters deeper than thirty meters (100 feet), preferring instead the kelp beds, which serve as resting, foraging, and nursery sites.

5

Potential Impacts

Marine mammal could potentially be affected by the proposed Project. Potential impacts include the disturbance of marine mammals due to noise associated with cable laying activities and an increase in risk that a large marine mammal might become entangled in an anchor line or be hit by a vessel due to construction activities and associated vessel traffic. However, no entanglement of marine mammals has been documented during cable laying operations. Marine mammals tend to avoid vessels and areas of human activity and would be unlikely to approach the Project area during construction activities. Other potential impacts include noise disturbances from the cable laying operations, and contact with oil from an accidental fuel spill.

6

Mitigation Measures and Marine Mammal Monitoring

The Project Applicant has committed to implementing the following measures to avoid or minimize any potential impacts to marine mammals during construction and operation activities for the MARS Project. This section describes the procedures that shall be followed by all vessel crew members and marine mammal monitors on all MARS vessels during all construction activities.

6.1 Marine Mammal Observers

Two trained marine mammal monitors approved by the Executive Director in consultation with the NOAA Marine Fisheries Service ("NOAA Fisheries") shall be onboard the cable installation vessel (including repair and maintenance operations), the post-lay inspection vessel, burial vessels, and other support vessels at all times (alternating work shifts of a maximum of 4 hours each) to monitor for marine wildlife in the work area during all installation activities.. Additionally, two trained marine wildlife monitors approved by the Executive Director in consultation with NOAA Fisheries shall be onboard all vessels used for retrieval of entangled fishing gear, and for any routine inspection surveys. Prior to commencing any construction activities, marine mammal watches (or shifts) will be scheduled and assigned, and all monitoring and mitigation procedures shall be observed.

At least 10 days prior to the commencement of cable installation operations, the applicant shall provide to the approved marine mammal monitors a document compiling all marine mammal mitigation measures that have been required of the applicant by the responsible agencies.

6.2 Marine Mammal Observer Training

Prior to commencing construction activities, all marine mammal monitors shall be familiar with the Project, related proposed activities, and all monitoring and safety plans, including:

- The marine mammal monitoring plan for the project;
- Marine mammal sighting, identification and distance estimation methods;
- Marine mammal "safety zone" of 500 feet;



6. Mitigation Measures and Marine Mammal Monitoring

- Operation of specialized equipment (reticle binoculars, night vision devices and GPS systems); and
- Data recording and data entry systems including procedures for recording marine mammal sightings, monitoring activities, environmental conditions, and entry error control.

6.3 Marine Mammal Observer Equipment

The monitors shall have the appropriate safety and monitoring equipment to conduct their activities. The applicant shall ensure that the monitors have a 360-degree view of all activities during all marine operations (e.g., cable installation, post-lay inspection, burial, maintenance and repair, retrieval of entangled fishing gear, and inspection surveys). At a minimum the following equipment will be available for specific use by marine mammal observers:

- During daytime observations, all monitors shall use 7 x 50 reticulated binoculars.;
- During nighttime observations or as appropriate for low-light observations, all monitors shall use nighttime vision equipment.;
- GPS equipment (for location recording); and
- Rangefinder (to test and improve observer ability to estimate distances).

6.4 Commencement of Cable Lay Operations

- Prior to commencement of cable-lay operations, the monitors shall set a 500-foot safety zone around the vessel for the protection of marine mammals;
- Marine mammal monitors shall have the authority to stop any activity if it appears likely that a marine mammal could enter the safety zone;
- Two marine mammal monitors will make a visual survey for 30 minutes prior to commencing construction activities to ensure that no marine mammals are present within the safety radius established; and
- Once the area around the vessel is determined to be free of marine mammals, the cable-lay activities may commence.

6.5 Marine Mammal Sightings

The marine mammal monitors shall determine and report the following details of any marine mammal sighting:

- Bearing and distance to mammal;
- Identification of species;
- From bearing and distance, the perpendicular distance to ship track will be computed;

6. Mitigation Measures and Marine Mammal Monitoring

- The vessel pilot shall be advised immediately of all marine mammal sightings during construction activities; and
- The marine mammal monitor and vessel pilot shall plot current ship track and marine mammal position(s) to determine the estimated closest approach to the mammal.

6.6 Marine Mammal Evasion Procedures

If a marine mammal is sighted, the position of the marine mammal(s) shall be determined regularly by the marine mammal observer to determine its current and projected location with relation to the ship. If appropriate to vessel capabilities, and time permits, the marine mammal monitor shall consult with the vessel pilot to determine if evasive maneuvers (change in course, change in speed) can be taken to avoid the observed marine mammal.

If a marine mammal approaches the 500-foot (152-m) "safety zone", or the monitor determines that project operations have the potential to threaten the health or safety of marine wildlife or "take" a protected species as defined by regulations implementing the federal Endangered Species Act (50 CFR § 222.102) and the Marine Mammal Protection Act (50 CFR § 216.3), the monitors shall have the authority to order cessation of all project operations until the monitors determine there is no longer a threat and/or the animal(s) transits the area. The vessel pilot or captain shall comply with this order as soon as it is safe to do so and for as long as the order remains in effect.

If environmental conditions (e.g., high sea state, fog) preclude monitors from seeing out to at least one nautical mile, the monitors shall require personnel aboard work and support vessels to maintain heightened vigilance for an approaching marine mammal. If environmental conditions preclude the monitors from seeing within the 500-foot (152-m) safety zone, the monitors shall have the authority to order cessation of all project operations until visual conditions improve. The vessel captain or pilot shall comply with this order as soon as it is safe to do so and for as long as the order remains in effect.

6.7 Reporting

For all marine mammal sightings, the marine mammal monitor shall determine and report the following details to the required agencies:

- Location, and bearing and distance to mammal from the vessel;
- Direction of marine mammal travel;
- Identification of species;
- Monitors shall fax (or send electronically, as appropriate) a daily sighting report to NOAA Fisheries and FWS. The report shall contain a summary of daily activities, weather conditions, and information as described above for all marine mammal sightings;



6. Mitigation Measures and Marine Mammal Monitoring

- MBARI shall immediately contact The Marine Mammal Center for assistance should a marine mammal be observed to be in distress;
- In the event that a whale becomes entangled in any cables or line, the monitor shall immediately notify The Marine Mammal Center and all required agencies (as provided in Table 6.7-1 below), so appropriate response measures can be implemented. Similarly, if any take involving harassment or harm to a marine mammal occurs, the monitor shall immediately notify the required regulatory agencies; and
- Within 30 days of the last day of all marine operations that require marine mammal monitors onboard a vessel(s) the applicant shall submit to the Executive Director and NOAA Fisheries a marine mammal monitoring report prepared by the approved marine mammal monitors. The report shall include: (a) an evaluation of the effectiveness of monitoring protocols and (b) reporting of (i) marine mammal and other wildlife sightings (species and numbers); (ii) any wildlife behavioral changes that may have been attributable to project operations; and (iii) any project delays or cessation of operations due to the presence in the project area of marine wildlife species.

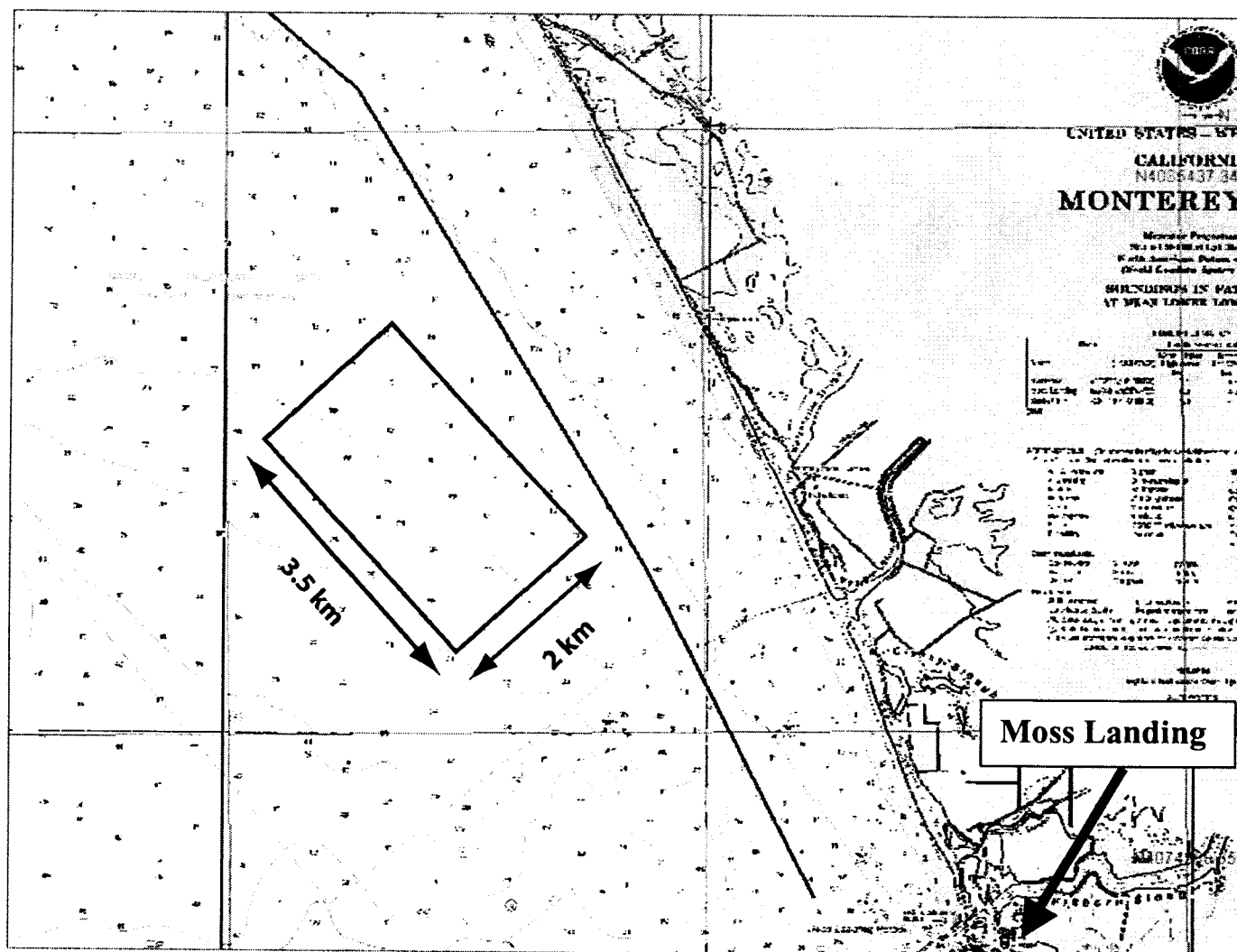
Table 6.7-1. Important Contact Information

Agency or Organization	Address	Phone Numbers
The Marine Mammal Center	Monterey Bay Operations PO Box 778 Moss Landing, CA 95039	Rescue line: 831.633.6298 Main line: 415.289.SEAL (7325)
NOAA Fisheries		
U.S. Fish and Wildlife Service		
California Coastal Commission		

7

References

Ryan, Sheila. California Coastal Commission. Personal communications, July 2005;



Survey area for derelict gear.

