FINAL
ENVIRONMENTAL ASSESSMENT
AUSTRALIA-HAWAII FIBER OPTIC CABLE SYSTEM
KEAWAʻULA, OʻAHU, HAWAIʻI

TMK 8-1-01: PARCEL 08

Prepared in Accordance with Requirements of Chapter 343, Hawaiʻi Revised Statutes and Title 11, Chapter 200, Hawaiʻi Administrative Rules

Prepared for:
Telstra Inc.

Submitted by:
AMEC Earth & Environmental, Inc.

November 2007

Project No. 7551003100-1003

FINAL ENVIRONMENTAL ASSESSMENT

Australia-Hawaii Fiber Optic Cable System
Keawa‘ula, O‘ahu, Hawai‘i

TMK 8-1-01: Parcel 08

November 2007

Proposed by:

Telstra Inc.

40 Wall Street, 40th Floor
New York, New York 10005

Prepared by:

AMEC Earth & Environmental, Inc.
3375 Koapaka Street, Suite F251
Honolulu, Hawaii 96819
Phone: +1.808.545.2462

PROJECT SUMMARY

Project:	Australia-Hawaii Fiber Optic Cable System
Applicant:	Telstra Inc.
Accepting Authority:	State of Hawai‘i Department of Land and Natural Resources
Tax Map Key:	8-1-01: Parcel 08
Location:	Keawa‘ula, O‘ahu, Hawai‘i
Lot Area:	0.3 acre of 28-acre parcel
Owner:	State of Hawai‘i Dept. of Land and Natural Resources P.O. Box 621 Honolulu, Hawai‘i 96809
Agent:	AMEC Earth & Environmental Inc. 703 Market Street, Suite 1511 San Francisco, CA 94103 Contact: Denise Toombs 415.261.6693
Existing Land Uses	Beach Park, Telecommunications Facilities
State Land Use District:	Conservation
Development Plan Land Use Designation:	Preservation
County Zoning Designation:	Preservation (P-1)
Permits/Approvals Required:	Conservation District Use Permit, Submarine Easement, Shoreline Setback Variance, U.S. Army Corps of Engineers permit

EXECUTIVE SUMMARY

ES.1 Introduction

Telstra Inc. has contracted Alcatel-Lucent to supply and install one subsea fiber optic cable that will provide a connection between the existing cable station and onshore telecommunications infrastructure at Keawa‘ula, O‘ahu, and Telstra’s existing infrastructure in Sydney, Australia. The proposed subsea cable system, the Australia-Hawaii system[1], consists of a single fiber-optic cable that will interconnect with other cable systems at Hawai‘i providing direct access to the U.S. mainland and increase and improve international connectivity and reliability between Australia and the U.S., and accommodating projected growth in broadband applications.

The project design aims to minimize new construction by focusing on the use of spare capacity within the existing infrastructure currently available at Keawa‘ula, already one of the major international subsea cable landing sites in Hawai‘i. It incorporates measures to reduce disruption to the local community and resources during the installation phase by coordinating installation with another project, as described in the Project Description.

Project activity will consist of installation of the subsea cable, “landing” the cable at the beach adjacent to the existing beach manhole (BMH), connection to the cable station via the existing BMH and ducts, and operation of the cable system for a period of approximately 25 years.

ES.1.1 Project Location

The project location is on the west side of O‘ahu, in the Wai‘anae District of the City and County of Honolulu, and offshore of this location, generally to the west of the coast. The cable landing location consists of the existing AT&T Keawa‘ula conduits, BMH and cable station, and is described in more detail in Chapter 2, Project Description, including location maps.

ES.1.2 Background and Purpose

The purpose of the project is to contribute to the upgrading of telecommunications between Australia, and the U.S. in response to rapidly increasing demand.

[1] The system is also referred to as the “Sydney-Hawaii” system in an application to the Federal Communications Commission (FCC) for a Submarine Cable Landing License.

Currently the only submarine cable that directly links Australia and the United States is the Southern Cross Cable. The new Australia-Hawaii Cable System therefore will increase and improve international connectivity and reliability on this important route. This new cable system will provide extra capacity for the increasing amount of international traffic required by the growing number of home and business broadband users. Businesses and consumers will benefit from enhanced capacity and reliability on this new cable system to enjoy innovative services such as telecommuting, video conferencing, advanced multimedia and mobile video applications. Equally important, the addition of the Australia-Hawaii Cable System into the international telecommunications infrastructure will add a new layer of redundancy to telecommunications networks linking the United States and Australia, thereby reducing the potential for call failures during natural or other disasters, a critical component to strengthening homeland security.

A further technical consideration is the planned installation of another system at the Keawa‘ula landing, the Asia-America Gateway (AAG), which would install two additional fiber-optic cables at the same landing point. Therefore, an additional project objective is to *minimize beach and community disturbance for the Australia-Hawaii and AAG systems combined*.[2]

ES.2 Proposed Action and Methods

The project consists of the following elements:

- Cable installation by main lay vessel;
- Shore End landing through to BMH; and
- Commissioning and operation of the system.

Each of these project elements is described below.

ES.2.1 Main Lay Cable Installation

Main lay cable installation will involve laying the cable along a pre-determined route using special-purpose cable ships.

[2] The Australia-Hawaii and AAG systems are independent projects. However, because they are expected to share a common landing point, a key project objective for the Australia-Hawaii project is to develop an approach that will reduce the combined disturbance of the two installations to the beach and to the local community.

Cable Route – The routing is designed to avoid potential hazards, disruption to marine resources and operations, and to secure long-term protection of the cable. The project route is situated among the existing cables already installed at the landing point.

Cable-laying Vessels – The main cable-laying vessel installing the cable in Hawai‘i’s waters will have a dynamic positioning (DP) system that enables it to maneuver in the nearshore area without anchoring. Smaller boats are typically required to assist the cable ship during the Shore End landing operation. The cable ship will comply with applicable regulations and international conventions addressing navigational safety, safe operations, and pollution prevention measures. The main lay will be conducted 24 hours per day until the ship reaches shallow water from where the Shore End landing operation is carried out. During the main lay, the ship will operate at a speed of approximately 4 knots as it approaches O‘ahu. From the point of entering U.S. territorial waters (at the 12 nautical mile [nm] limit), the duration of the main lay operations will be approximately one day to approach the Keawa‘ula landing.

The main lay and landing are scheduled for February 2008.

ES.2.2 Shore End Landing

The Shore End landing will consist of the following key activities:

- Beach preparation and equipment staging;
- Cable landing operation;
- Cable pull to BMH;
- Placement on seafloor and application of cable protection where required; and
- Post-landing operations, including beach burial and restoration.

It is proposed that the Shore Ends for the separate AAG Cable System will also be installed at the same time. Two AAG cables will be landed to the same BMH immediately following the Australia-Hawaii cable landing. Although this project is evaluated in a separate environmental assessment and permitting process, installation of the AAG cables is mentioned in this Draft Environmental Assessment (EA) because the two installation processes are being coordinated to reduce disruption and impact to the project area.

Beach Preparations

After identifying existing cables at the beach using specialized cable detection equipment, an area will be excavated by a small mechanical excavator at the top/back of the beach, exposing the beach end of existing conduits coming from the BMH. Also before the landing, the excavator will be positioned on the grass area on the seaward side of the Farrington Highway, to be used as a deadweight holding-point for the cable-hauling winch. The winch will also be positioned on the grass area, seaward of the excavator but landward of the end of the conduit exit point. By using the excavator as a deadweight holding point, no excavation to the landward side of the conduit will be necessary, thereby minimizing the project footprint.

Equipment and Materials
- Excavator
- Winch
- Shovels, hand tools
- Cable detection equipment
- Hauling ropes, floats
- Work boats

The worksite will be cordoned off from public access using safety fencing. Markers and site control on the beach will identify and maintain a safe work area, without the need to close the entire beach area to users. Security will be provided for equipment that may be staged overnight. Farrington Highway will not be affected by this cable landing set-up and will therefore remain safely open to public use throughout all operations.

Cable Landing Operation

Before the landing, the cable ship will arrive laying cable from her stern, heading in towards the beach. When the cable ship arrives a safe distance offshore (expected to be at the 15 m [49 ft] contour, approximately 1000 m [3281 ft] offshore), the vessel will stop laying. She will maintain position using her DP system, so no anchoring is expected to be required. The landing operation will be conducted during daylight hours, with operations usually commencing around 06:00 am local time.

Vessels and Divers
- Cable ship: 140 m
- No anchoring
- Support boats: 1-2
- Divers, landing: 1-2
- Divers, post-lay: 4-5

The ship will simultaneously pay out the cable, allowing it to be pulled ashore. Tension will be monitored at both the winch and cable ship. As the cable is paid out from the cable ship, floats will be attached as necessary using short lengths of rope. As the floats reach the shore line they will be removed from the cable and returned to the cable ship by a work boat.

The floats will be cut away progressively from the shore line towards the cable ship. As the divers cut the floats, the cable will fall into its desired position. The divers will confirm the cable is lying flat on the seabed in an acceptable manner and position, and where possible may manually reposition the cable if required. Specifically for the Keawa‘ula landing, the divers will direct the cable through the inner reef gaps.

Once the cable is laid onto the seabed, the cable end, currently on the beach, will be fed up the ducts to the BMH. Should the initial positioning of the cable onto the seabed result in minor irregularities in the lay of the cable, some of the 25 m (82 ft) of beach slack will be walked out along the cable line by divers, in order to provide some excess cable to allow adjustment of the lay-down position of the cable.

Once inside the BMH, the cable armor wires will be anchored inside the BMH, and the beach joint will then commence. This operation is expected to conclude by late morning. The two AAG cables, which are a separate project, could also be completed on the same day, or on the following day as needed, depending on the weather and swell conditions remaining suitable.

Post Landing Operations

On the beach, once the cables have been fed into the conduit to the BMH, articulated pipe will be applied over each cable, from the conduit end to offshore. A trench will then be excavated from the existing excavation at the end of the BMH conduits down to the waterline to bury the cables. All excavations will then be back-filled and the beach returned to its former condition. No sediments will be removed from the project area, nor will materials be introduced to the beach to fill the excavated area.

An excavator will be used to bury the cable as close as possible to the low water mark, and self-burial of the cable is expected to occur through the surf zone. Otherwise, in areas where self-burial has not occurred, jet burial into the seabed by divers out to the 3 m (10 ft) water depth contour will be carried out where possible and where adequate sediment is present.

Articulated pipe will continue to be applied not only across the beach, but also to a distance of 200 m (656 ft) offshore (about 6 m [20 ft] water depth). This is consistent with the existing cables at the landing.

Duration of Shore End Activities

The expected duration of the installation Shore End activities are noted below, and an estimated breakdown of duration by activity is shown in Table ES-1.

Table ES-1. Duration of Shore End Landing Activities

Activity	Duration (days)
Beach preparation, equipment staging	3
Shore End landing	1 to 3
Post-landing operations	1 to 3
Beach completion and restoration	1
Total Duration	6 to 10

Operation

Once installed, the cable requires no routine maintenance. The existing cables at Keawa`ula, for example, have remained in place since installation and have required no maintenance or repair.[3] In the unlikely event of a repair being required, this would be done using similar equipment and techniques as installation, in the water and on the beach.

ES.3 Alternatives Considered

Because there are established cable landings and onshore infrastructure available on O‘ahu, only existing cable stations and landings were considered as a means of avoiding new construction. The Makaha cable landing and station are located approximately 8 km (5 mi) south of the Keawa‘ula site on the Wai`anae coast. Like the Keawa‘ula location, Makaha has existing infrastructure and an operating cable station. It is the landing point for 10 existing cables, of which five are out of service, and two planned cables.[4] Telstra selected the Keawa‘ula cable station and landing site over Makaha because of the combination of available capacity and landing services at the Keawa‘ula location.

[3] James Murray, AT&T 2007.
[4] The Sandwich Isles Communications system is expected to install two cables at the Makaha landing.

The project proposes a direct landing method for installing the Australia-Hawaii cable, and plans to incorporate the installation of the two AAG cables during the same installation period[5] to reduce total beach disturbance. This technical approach is consistent with prior landings at the project location, and is the most common technique used in the industry throughout the world. Other techniques were considered during the development of this project. They are:

- Direct landing of the Australia-Hawaii cable followed by later separate installation of the AAG Cables.
- Direct landing with "bundled" shore-end cables.
- Direct landing of the Australia-Hawaii cable with installation of additional ducts between the conduit end and water line.
- Horizontal directional drilling (HDD).
- No Action.

Installation using HDD was considered because this technique is used in some applications to avoid surface disturbance to roads, beaches, and other areas where trenching is problematic. HDD has been used successfully in cable installations where there is no existing landing site (and BMH), the distance across the beach or other sensitive area is sufficiently long that beach use would be precluded by direct landing, and subsurface geology is suitable to prevent release of drilling fluid into the marine environment through rock fissures during development of the bore.[6]

HDD was evaluated as an alternative installation technique for the Keawa'ula landing site by developing the site-specific technical requirements for this approach to determine the installation footprint, duration, and potential effects. Compared with the proposed project, the HDD approach would require more equipment and materials to be staged and used in the project area, including diesel for fuel and bentonite for use as drilling mud or lubricant. Because the location is not near residential or similar receptors, the noise, dust, and equipment exhaust from the HDD operations would probably be minor, but could cause short-term nuisance or airborne irritants to recreational users. In addition, although spillage capture techniques are used during HDD operations (spill tanks, straw bales etc), there remains potential for bentonite,

[5] The AAG cable installation is independent of the Australia-Hawaii project, and would require separate review and approval from this project. However, because they share a common landing point and approximate installation schedule, the two project teams are coordinating their efforts to minimize overall construction-related disturbance.
[6] Such releases are called "frac-outs" and result when the fluid, typically a bentonite slurry, escapes through a fracture in the subsurface rock or substrate and is released into the water. This is of particular concern to reefs and areas of live rock because the bentonite, though typically non-toxic, can disperse and interfere with the organisms' feeding and filtration mechanisms, or cause abrasion. See California State Lands Commission 2005 (Monterey Bay Accelerated Research System [MARS] Cabled Observatory System EIS/EIR), for example.

topsoil or other sediment to escape into the fresh and seawater environments should heavy rain conditions affect the site.

The short-term effects of HDD installation would exceed those of the preferred project in both duration and intensity, and potentially create additional complexity not encountered during previous installations at the project site. Neither the beach nor the nearshore project areas show signs of long-term disruption or damage to coral and marine growth from the prior installations using the direct landing technique proposed.[7] In fact, the diver swim operations have shown that existing cable systems have provided suitable substrate for coral growth on the cable surfaces. Therefore the HDD alternative was not selected on the basis of the relative impacts compared with the preferred project.

ES.4 Summary of Impacts and Proposed Mitigations

Table ES-2 provides a summary of impacts by resource area, best management practices that reduce or avoid effects, and proposed mitigation measures.

ES.5 Significance Criteria

Hawai‘i Administrative Rules, Title 11, department of Health, Chapter 200, “Environmental Impact Statement Rules” provides significance criteria for evaluating impacts on the environment. Table ES-3 lists the significance criteria and the recommended findings, based on the evaluation presented in this Draft EA. The recommended preliminary determination for the proposed project is a Finding of No Significant Impact (FONSI).

[7] During a prior installation a channel was cut through two sections of the reef to enable placement of cable; this is not proposed for the installation of the Australia-Hawaii cable.

Table ES-2. Australia–Hawaii Cable System Project Impacts Summary

Resource Area	Short-term Impacts	Long-term Impacts	Mitigation and Best Management Practice (BMP)
Topography & Geological Resources	• Ground-disturbing activities (i.e., during site preparation and construction). • Temporary redistribution of sediments.	No impact	BMPs: • Site restoration to original condition at conclusion of project. No Mitigation required.
Land Use	• Controlled public access in a limited area of the beach at Ka'ena Point State Park.	No impact	BMPs: • Local authorities, such as State Parks and local lifeguards, will be given advance notice of the work schedule. • Controlled access to the work area for public safety, but no beach closures. Access will be controlled through a number of measures, which may include temporary fencing, signage, and staff. • Security protection of equipment for public safety. Mitigation: • Protection of coastal resources (see Archaeological and Historical Resources).
Archaeological & Historical Resources	• Potential disturbance to archaeological and historical resources during excavation.	No impact	Mitigation: • A qualified archaeological monitor will be present during excavation activities in the cable corridor; and • If potentially significant resources are uncovered during excavation or trenching activities, all excavation or trenching activity shall halt until the nature and significance of the resources can be determined by the on-site archaeologist.
Cultural, Social & Economic Resources	No impact.	No impact	See Land Use and Archaeological Resources for related BMPs and mitigations.
Visual & Aesthetic Resources	• Presence of equipment and vessels and equipment for 6 to 10 days, which will be visible to beach users.	No impact	No BMPs or mitigations required.

Table ES-2. Australia–Hawaii Cable System Project Impacts Summary (Continued)

Resource Area	Short-term Impacts	Long-term Impacts	Mitigation and BMP
Water Resources	• Localized and temporary increase in turbidity in the surf zone when cables jetted into the sediments by divers.	No impact	BMPs: • Management of refuse and general site management to prevent materials from entering drainages or ocean. • Spill prevention and response plans for vessels and site management of equipment fluids. No Mitigation required.
Marine & Nearshore Resources	No impact.	No impact	BMPs: • Use of desktop study findings to select cable design and routing; • Application of cable route survey data to refine the cable route and design to avoid external hazards (landslides, steep slopes, anchorages); and • Maximized use of existing infrastructure and landing sites, which provides site and operating history that can be used in routing and cable design. No Mitigation required.
Terrestrial & Aquatic Biological Resources	• Short-term disturbance to the flat grassy area between the Farrington Highway and the beach during excavation. • Potential for short-term disturbance to marine mammals and sea turtles by the presence of vessels and placement of cables during installation of the cable. • Potential direct effects on corals during installation of the cable on the seafloor.	No impact	BMPs: • Following the completion of construction activities, the contractor will return the site to its preconstruction condition. • Vessel crew will be briefed on the specific requirements to be adhered to during installation in the project area so they are fully aware of issues or resources with project-specific procedures or reporting requirements. • Inshore installation procedures are based on an established route that was developed in concert with the marine biological dive survey so procedures are aligned with site-specific considerations. Corals and reef structures were factored into the route planning. Mitigations:

Table ES-2. Australia–Hawaii Cable System Project Impacts Summary (Continued)

Resource Area	Short-term Impacts	Long-term Impacts	Mitigation and BMP
			• Marine Protected Species Protection Protocols for marine mammals and turtles will be implemented by an onboard observer during installation to identify and take actions (if needed) to avoid disturbance to or contact with an animal. • An observer shall be present on shore prior to beach activities to ensure there are no turtles or seals present at the beach. • Designated resource managers will be contacted for any incidents involving marine mammals or sea turtles. The "hotline" numbers shall be included on the protocols noted above, and incidents shall be documented in the ship's daily log. • A video transect of the installed cable alignment will be conducted from shore (visibility in the surf zone allowing) to the 25-m (82-ft) water depth contour to document post-installation conditions. Telstra will formulate a mitigation plan, based on observed conditions, with input from the relevant resource agencies. Mitigation will be developed, as required, to provide an adequate and appropriate means of addressing site-specific and species-specific impacts.
Air Quality	• Short-term and localized emissions from excavator and winch.	No impact	BMPs: • Construction equipment and vehicles shall be maintained in proper working order to reduce air emissions. No Mitigations required.
Noise	• Temporary source of noise above ambient levels from excavation, winch, and vessels.	No impact	No BMPs or mitigation measures required.
Public Facilities	• Disruption to a limited area of the beach at Ka'ena Point State Park.	No impact	See Land Use for related BMPs and mitigations.

Table ES-3. Summary of Impacts and Mitigation

No.	Significance Criteria	Significant?
1	*Involves an irrevocable commitment to loss or destruction of any natural or cultural resource*	No
2	*Curtails the beneficial uses of the environment*	No
3	*Conflicts with the State's long-term environmental policies or goals and guidelines expressed in Chapter 344, Hawai'i Revised Status (HRS), and any revisions thereof and amendments thereto, court decisions, or executive orders*	No
4	*Substantially affects the economic or social welfare of the community or State*	No
5	*Substantially affects public health*	No
6	*Involve substantial secondary impacts*	No
7	*Involves substantial degradation of environmental quality*	No
8	*Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions*	No
9	*Substantially affects a rare, threatened, or endangered species, or its habitat*	No
10	*Detrimentally affects air or water quality or ambient noise levels*	No
11	*Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a floodplain, or coastal waters*	No
12	*Substantially affects scenic vistas and viewplanes identified in county or state plans or studies*	No
13	*Requires substantial energy consumption*	No

TABLE OF CONTENTS

SECTION **TITLE** **PAGE**

EXECUTIVE SUMMARY ES-1

ACRONYMS VI

CHAPTER 1: INTRODUCTION 1-1

1.1 Overview 1-1
1.2 Applicant and Supplier 1-1
1.3 Project Location 1-2
1.4 Conventions Used in This Document 1-2
1.5 Organization of this Document 1-2

CHAPTER 2: PROJECT DESCRIPTION 2-1

2.1 Project Location and Existing Infrastructure 2-1
2.2 Purpose and Need for the Project 2-1
2.3 Background on Cable Technology and Route Planning 2-4
2.4 Proposed Action 2-7
2.4.1 Main Lay Cable Installation 2-7
2.4.2 Shore End Landing 2-8
2.4.2.1 Beach Preparations 2-8
2.4.2.2 Cable Landing Operation 2-8
2.4.2.3 Post Landing Operations 2-8
2.4.2.4 Duration of Shore End Activities 2-8
2.4.3 Operation 2-8
2.4.4 Best Management Practices and Mitigation Measures 2-8
2.4.5 Project Schedule and Cost 2-8

CHAPTER 3: ALTERNATIVES CONSIDERED 3-1

3.1 Alternative Development 3-1
3.1.1 Landing Site and Route Selection Criteria 3-1
3.1.2 Shore-End Landing Considerations 3-2
3.2 Alternative Landing Sites 3-2
3.3 Alternative Installation Methods 3-2
3.3.1 Direct Landing and Separate Installation of AAG Cables 3-3
3.3.2 Direct Landing with "Bundled" Shore-End Cables 3-3
3.3.3 Direct Landing and Installation of Ducts Between the Conduit End and Water Line 3-4
3.3.4 Horizontal Directional Drilling 3-5
3.4 No Action Alternative 3-13

CHAPTER 4: AFFECTED ENVIRONMENT 4-1

4.1 Topography and Geological Conditions 4-1
4.1.1 Existing Conditions 4-1
4.1.1.1 On-Shore Setting 4-1
4.1.1.2 Offshore Setting 4-1
4.1.2 Geologic Hazards 4-4
4.1.2.1 Earthquakes 4-4

TABLE OF CONTENTS
(continued)

SECTION **TITLE** **PAGE**

4.1.2.2 Volcanoes 4-4
4.1.2.3 Tsunamis 4-4
4.1.3 Short-Term Impacts 4-4
4.1.4 Long-Term Impacts 4-6
4.1.5 Mitigation Measures/Best Management Practices 4-6
4.2 Land Use 4-6
4.2.1 Existing Conditions 4-6
4.2.1.1 Subzone 4-7
4.2.1.2 Coastal Zone 4-7
4.2.2 Short-Term Impacts 4-9
4.2.3 Long-Term Impacts 4-10
4.2.4 Mitigation Measures/Best Management Practices 4-10
4.3 Archaeological and Historic Resources 4-11
4.3.1 Existing Conditions 4-11
4.3.2 Short-Term Impacts 4-13
4.3.3 Long-Term Impacts 4-13
4.3.4 Mitigation Measures/Best Management Practices 4-13
4.4 Cultural, Social and Economic Activities 4-13
4.4.1 Existing Conditions 4-13
4.4.2 Short-Term Impacts 4-14
4.4.3 Long-Term Impacts 4-14
4.4.4 Mitigation Measures/Best Management Practices 4-15
4.5 Visual and Aesthetic Resources 4-15
4.5.1 Existing Conditions 4-15
4.5.2 Short-Term Impacts 4-15
4.5.3 Long-Term Impacts 4-16
4.5.4 Mitigation Measures/Best Management Practices 4-16
4.6 Water Resources 4-16
4.6.1 Existing Conditions 4-16
4.6.1.1 Surface Water 4-16
4.6.1.2 Flood Hazards 4-17
4.6.1.3 Groundwater 4-17
4.6.2 Short-Term Impacts 4-17
4.6.3 Long-Term Impacts 4-18
4.6.4 Mitigation Measures/Best Management Practices 4-18
4.7 Marine and Nearshore Conditions 4-18
4.7.1 Existing Conditions 4-18
4.7.1.1 Bathymetry 4-18
4.7.1.2 Marine Hazards 4-20
4.7.2 Short-Term Impacts 4-21
4.7.3 Long-Term Impacts 4-21
4.7.4 Mitigation Measures/Best Management Practices 4-21
4.8 Terrestrial and Marine Biology 4-22
4.8.1 Existing Conditions 4-22
4.8.1.1 Terrestrial Biology 4-22
4.8.1.2 Marine Biology 4-23

TABLE OF CONTENTS
(continued)

SECTION **TITLE** **PAGE**

4.8.2 Short-Term Impacts 4-26
4.8.2.1 Terrestrial Biology 4-26
4.8.2.2 Marine Biology 4-26
4.8.3 Long-Term Impacts 4-27
4.8.3.1 Terrestrial Biology 4-27
4.8.3.2 Marine Biology 4-28
4.8.4 Mitigation Measures/Best Management Practices 4-28
4.8.4.1 Terrestrial Biology 4-28
4.8.4.2 Marine Biology 4-28
4.9 Air Quality 4-30
4.9.1 Existing Conditions 4-30
4.9.1.1 Climate 4-30
4.9.1.2 Regional Setting 4-31
4.9.2 Short-Term Impacts 4-31
4.9.3 Long-Term Impacts 4-32
4.9.4 Mitigation Measures/Best Management Practices 4-32
4.10 Noise 4-32
4.10.1 Existing Conditions 4-32
4.10.2 Short-Term Impacts 4-33
4.10.3 Long-Term Impacts 4-33
4.10.4 Mitigation Measures/Best Management Practices 4-33
4.11 Public Facilities 4-33
4.11.1 Existing Conditions 4-33
4.11.1.1 Recreational Facilities 4-33
4.11.1.2 Transportation Facilities 4-35
4.11.1.3 Telecommunication Facilities 4-35
4.11.2 Short-Term Impacts 4-35
4.11.3 Long-Term Impacts 4-36
4.11.4 Mitigation Measures/Best Management Practices 4-36

CHAPTER 5: SECONDARY AND CUMULATIVE IMPACTS 5-1

5.1 Secondary Impacts 5-1
5.1.1 Potential Impacts of the Submarine Cable 5-1
5.1.2 Potential Impacts at Landing Site 5-1
5.2 Cumulative Impacts 5-2
5.2.1 Potential Impacts of Submarine Cable 5-2
5.2.2 Potential Landing Site Impacts and Interactions with Planned Projects 5-2

CHAPTER 6: CONSISTENCY AND COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS, PLANS, AND POLICIES 6-1

6.1 Federal Regulations 6-1
6.1.1 Rivers and Harbors Act Section 10 6-1
6.1.2 Clean Water Act Section 404/401 6-1
6.1.3 Endangered Species Act and Other Laws Protecting Biological Resources 6-2
6.1.4 National Historic Preservation Act (NHPA) 6-2

TABLE OF CONTENTS
(continued)

SECTION **TITLE** **PAGE**

6.2 State Plans, Policies and Regulations 6-3
6.2.1 Hawai'i State Plan 6-3
6.2.2 Hawai'i State Land Use Controls 6-4
6.2.3 Conservation District Use Permit 6-4
6.2.4 Hawai'i Revised Statutes Chapter 6E 6-5
6.2.5 State Endangered Species Law, HRS Chapter 195D 6-5
6.2.6 Coastal Zone Management 6-5
6.3 County Plans, Policies and Regulations 6-5
6.3.1 Special Management Area and Shoreline Setback 6-5
6.3.2 City and County of Honolulu General Plans 6-6
6.3.3 City and County of Honolulu Zoning Ordinances 6-8
6.3.4 Wai'anae Sustainable Communities Plan 6-8
6.4 List of Permits and Approvals 6-11
6.5 Consultations 6-12

CHAPTER 7: PRE-CONSULTATION AND COORDINATION 7-1

7.1 Regulatory Consultation and Coordination 7-1
7.1.1 Federal Agencies 7-1
7.1.2 State Agencies 7-2
7.1.3 City and County of Honolulu 7-2
7.1.4 Neighborhood Board No. 29 (Wai'anae) 7-2

CHAPTER 8: IMPACTS, MITIGATIONS, AND SIGNIFICANCE EVALUATION 8-1

8.1 Summary of Impacts 8-1
8.2 Significance Evaluation 8-1

CHAPTER 9: FINDINGS AND REASONING SUPPORTING DETERMINATION 9-1

CHAPTER 10: REFERENCES 10-1

LIST OF APPENDICES

A DIVE SURVEY REPORT
B ARCHAEOLOGICAL ASSESSMENT
C MARINE PROTECTED SPECIES PROTECTION PROTOCOLS
D COMMENT LETTERS AND RESPONSES

LIST OF FIGURES

NUMBER **TITLE** **PAGE**

Figure 1-1. Project Area and Landing Location....1-4
Figure 2-1. Location Map Showing Landing Site with Inset of O'ahu....2-2
Figure 2-2. Existing Infrastructure at Project Site....2-3
Figure 2-3. Double Armored Cable....2-6
Figure 2-4. Cable Route....2-8
Figure 2-5. Layout of Shore End Beach Activities....2-8
Figure 2-6. Typical Excavation at Conduit Ends....2-8
Figure 2-7. Layout of Beach Equipment....2-8
Figure 2-8. Typical Landing Directly from Cable Ship....2-8
Figure 2-9. Vessel Approaching Landing....2-8
Figure 2-10. Vessel Turns Perpendicular to Cable Line....2-8
Figure 2-11. Payout of Cable from Ship to Beach....2-8
Figure 2-12. Cable Floated Ashore and Vessel is Released....2-8
Figure 2-13. Articulated Pipe Applied over Cable Across Beach before Burial....2-8
Figure 2-14. Articulated Pipe on Existing Cable....2-8
Figure 3-1. HDD Footprint....3-6
Figure 3-2. Photos from Sydney HDD....3-7
Figure 4-1. Offshore Geologic Setting in the Vicinity of the Project Area....4-3
Figure 4-2. Earthquake Hazards Map of the Proposed Project Area....4-5
Figure 4-3. Land Use Designations in the Vicinity of the Proposed Project....4-8
Figure 4-4. Bathymetry....4-19
Figure 4-5. Plants Observed at Project Site....4-23
Figure 4-6. Public Facilities in the Vicinity of the Proposed Project....4-34
Figure 6-1. Special Management Area & Existing Cables in Project Corridor....6-7
Figure 6-2. Shoreline Survey....6-9

LIST OF TABLES

NUMBER **TITLE** **PAGE**

Table ES-1. Duration of Shore End Landing Activities....ES-6
Table ES-2. Australia-Hawaii Cable System Project Impacts Summary....ES-9
Table ES-3. Summary of Impacts and Mitigation....ES-12
Table 2-1. Duration of Shore End Landing Activities....2-8
Table 2-2. Best Management Practices....2-8
Table 3-1. Elements of the HDD Alternative....3-8
Table 3-2. Comparison of Proposed Project and HDD Effects....3-11
Table 4-1. Plants Observed at the Project Site....4-22
Table 4-2. State and Federal Ambient Air Quality Standards....4-30
Table 4-3. Maximum Permissible Noise Levels....4-32
Table 8-1. Australia-Hawaii Cable System Project Impacts Summary....8-2

ACRONYMS

AAG	Asia-America Gateway
ACHP	Advisory Council on Historic Preservation
BMH	existing beach manhole
BMP	Best Management Practice
CDUA	Conservation District Use Application
CDUP	Conservation District Use Permit
cm	centimeter
CMP	Hawai'i Coastal Zone Management Program
CRS	Cable Route Study
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DA	Double Armor
DLNR	Department of Lands and Natural Resources
DOH	Department of Health
DP	dynamic positioning
DTS	Desktop Study
EA	Environmental Assessment
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FCC	Federal Communications Commission
FMP	management plan for fishery resources
FONSI	Finding of No Significant Impact
ft	feet/foot
ft^2	square feet
GANDA	Garcia and Associates
HDD	Horizontal directional drilling
HRS	Hawai'i Revised Status
ICPC	International Cable Protection Committee
In	inches
km	kilometer
LW	Light Weight
m	meter
m^2	square meters
MARS	Monterey Bay Accelerated Research System
Mi	mile
mm	millimeter
NHPA	National Historic Preservation Act
nm	nautical mile
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OGB	ocean grounding bed
OOS	out-of-service cables
SA	Single Armor
SHPO	State Historic Preservation Officer
SMA	Special Management Area
TGN	TyCom Global Networks

USACE	U.S. Army Corps of Engineers
USC	United States Code
USCG	U.S. Coast Guard
USFWS	U.S. Fish and Wildlife Service
WPFMC	Western Pacific Fisheries Management Council
WQC	Water Quality Certification

CHAPTER 1: INTRODUCTION

1.1 Overview

Telstra Inc. has contracted Alcatel-Lucent to supply and install one subsea fiber optic cable that will provide a connection between the existing cable station and onshore telecommunications infrastructure at Keawaʻula, Oʻahu, and Telstra's existing infrastructure in Sydney, Australia. The proposed subsea cable system, the Australia-Hawaii system[1], consists of a single fiber-optic cable that will upgrade telecommunications services between Australia and Hawaiʻi, and also provide improved connectivity for other states, notably New Zealand, partially accessed through Telstra's Australian infrastructure. The system will also interconnect in Hawaiʻi with trans-Pacific systems extending from the west coast of the U.S. to Japan, China and other rapidly developing countries of the western Pacific rim, improving system security and diversity, and accommodating projected growth in broadband applications and trans-Pacific e-commerce.

The project design aims to minimize new construction by focusing on the use of spare capacity within the existing infrastructure currently available at Keawaʻula, already one of the major international subsea cable landing sites in Hawaiʻi. It incorporates measures to reduce disruption to the local community and resources during the installation phase by coordinating installation with another project, as described in Chapter 2.

Project activity will consist of installation of the subsea cable, "landing" the cable at the beach adjacent to the existing beach manhole (BMH), connection to the cable station via the existing BMH and ducts, and operation of the cable system for a period of approximately 25 years.

1.2 Applicant and Supplier

Telstra is Australia's leading telecommunications and information services company, offering a full range of services in all telecommunications markets throughout Australia. Telstra provides more than 9.86 million Australian fixed lines and more than 8.9 million mobile services. Telstra is also the country's most significant telecommunications infrastructure investor.

Alcatel-Lucent will design, manufacture and install the system, and is preparing the site-specific designs for the Australia-Hawaii system from Oʻahu to Sydney. Alcatel-Lucent is the world's

[1] The system is also referred to as the "Sydney-Hawaii" system in an application to the Federal Communications Commission (FCC) for a Submarine Cable Landing License.

largest supplier and installer of subsea systems, and has installed over 461,500 km (kilometers) (286,800 miles [mi]) of subsea networks. Alcatel-Lucent's technical expertise in the design, planning, routing and installation of submarine fiber optic systems has been applied worldwide, but also takes full account of local conditions (technical, environmental and regulatory) to develop each site-specific technical approach and plan.

1.3 Project Location

The project location is on the west side of O'ahu, in the Wai'anae District of the City and County of Honolulu, and offshore of this location, generally to the west of the coast. See Figure 1-1. The cable landing location consists of the existing AT&T Keawa'ula conduits, BMH and cable station, and is described in more detail in Chapter 2, Project Description.

1.4 Conventions Used in This Document

Dimensions such as length, area, and water depth are represented in both metric and English units. Most survey and design data are expressed in metric units and are used throughout this document. Approximate conversions are provided for readers most familiar with English units, but these conversions are not precise.

1.5 Organization of this Document

This Draft Environmental Assessment (EA) is organized in the following Chapters and appendices:

Executive Summary

Chapter 1 Introduction

Chapter 2 Project Description

Chapter 3 Alternatives Considered

Chapter 4 Affected Environment

Chapter 5 Secondary and Cumulative Impacts

Chapter 6 Consistency and Compliance with Federal, State and Local Regulations, Plans, and Policies

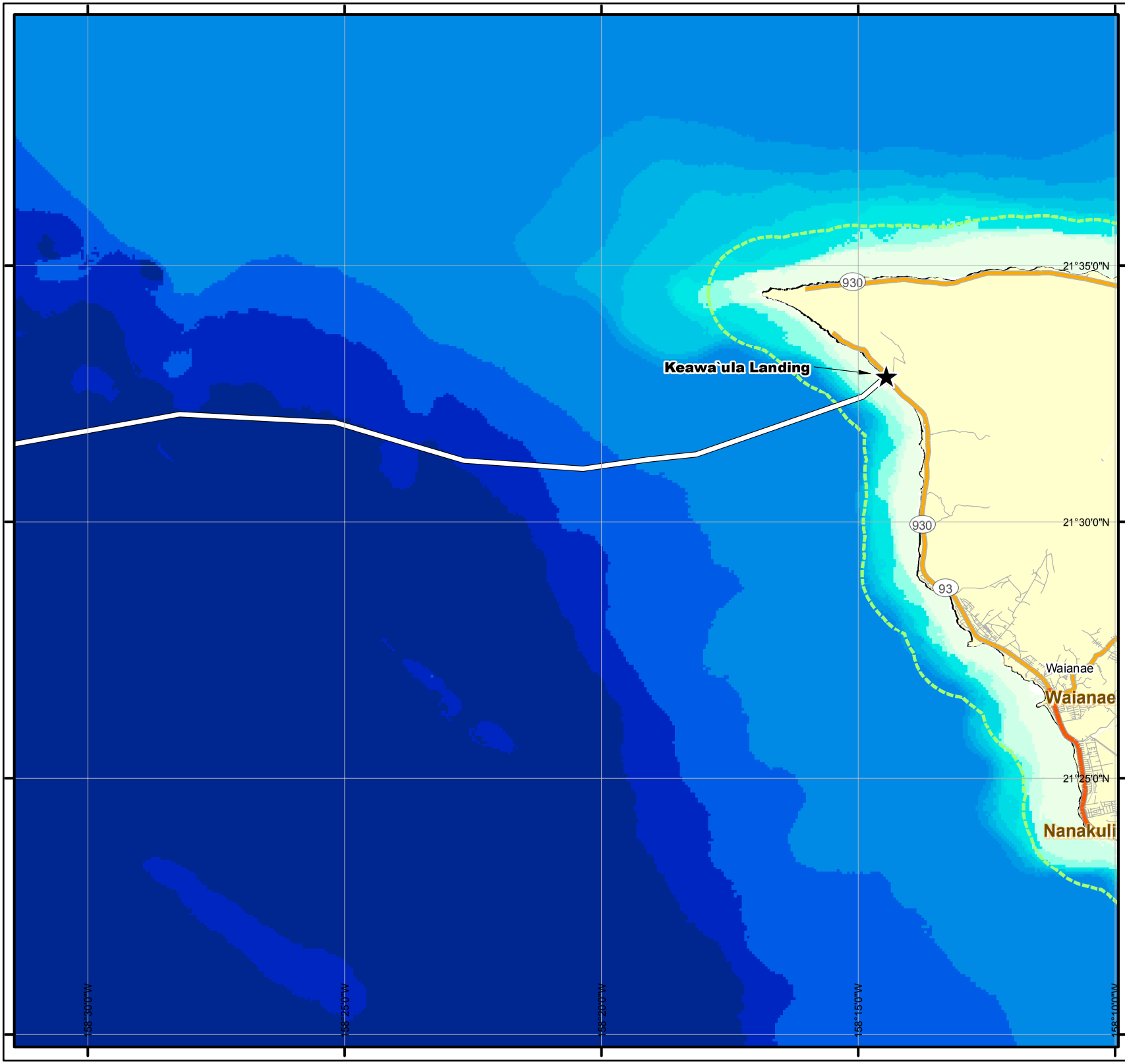
Chapter 7 Pre-Consultation and Coordination

Chapter 8 Impacts, Mitigations, and Significance Evaluation

Chapter 9 Findings and Reasoning Supporting Determination

Chapter 10 References

Appendices:
- A Dive Survey Report
- B Archaeological Assessment
- C Marine Protected Species Protection Protocols
- D Comment Letters and Responses



Legend

- Cable Landing Site
- Proposed Cable Route
- 1NM Contour

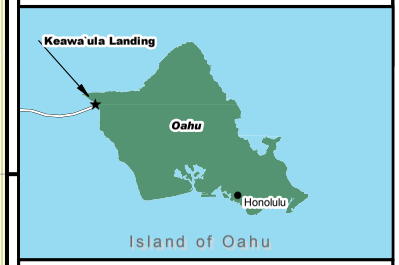
Water Depth (meters)

- -6000 to -4000
- -4000 to -2000
- -2000 to -1500
- -1500 to -1000
- 1000 to -200
- -200 to -100
- -100 to -70
- -70 to -50
- -50 to -40
- -40 to -30
- -30 to -20
- -20 to -10
- -10 to 0

Map Scale: 1:180,000

0 1 2 3 4 Nautical Miles

0 1 2 3 4 5 Kilometers



Data Sources

Proposed Cable Route: Alcatel Inc. (PSR11prov, 17 JUN 07)

Bathymetric Data: Divins, D.L., and D. Metzger, NGDC Coastal Relief Model, Retrieved March 14, 2007 http://www.ngdc.noaa.gov/mgg/coastal/coastal.html

Base Data: (Roads, Place Names) ESRI, 2006

Geodetic Parameters

Datum: WGS84 Projection: Mercator
Spheroid: WGS84 Coordinate System: GCS_WGS_1984
False_Easting: 0.000000
False_Northing: 0.000000
Central_Meridian: 0.000000
Standard_Parallel_1: 0.000000
Semimajor Axis: 6378137.000000
Semiminor Axis: 6356752.3142451793
Inverse Flattening: 298.257223563
Prime Meridian: 0.000000

FIGURE 1-1

Australia-Hawaii Project Area & Landing Location

amec

DATE: 18 JUN 2007	AUTHOR: LRK (Honolulu)
COMMENTS: None	REV: DMT (San Fran.)

FILEPATH:
hnl-fs1/hazmat/projects/Alcatel Submarine Cable/DWG/GIS/Maps/Figure 1-1 ProjAreaAndLandingLocation.mxd

CHAPTER 2: PROJECT DESCRIPTION

2.1 Project Location and Existing Infrastructure

The project location is on the west side of O‘ahu, in the Wai‘anae District of the City and County of Honolulu, and offshore of this location, generally to the west of the coast. The cable landing location consists of the existing AT&T Keawa‘ula conduits, Beach Manhole (BMH) and cable station. The station was constructed in 1985 and expanded in 1995, and is the terminus for nine subsea cables[1], as shown in Figure 2-1. Existing infrastructure that will be used for the Australia-Hawaii is shown in Figure 2-2 and noted in the inset (at right).

Existing Keawa‘ula Infrastructure proposed for use by Australia-Hawaii system

- 43-meter (138-foot) conduit under the beach and Farrington Highway, connecting to beach manhole
- Beach manhole
- Onshore duct to cable station
- Cable station

An important feature of the project is the use of existing telecommunications infrastructure and corridors, which will retain the present “footprint” of the infrastructure and use of the area as a hub for trans-Pacific telecommunication systems. The project activity is confined to the connection at the BMH, and therefore no terrestrial connections or related construction along or adjacent to Farrington Highway will be required.

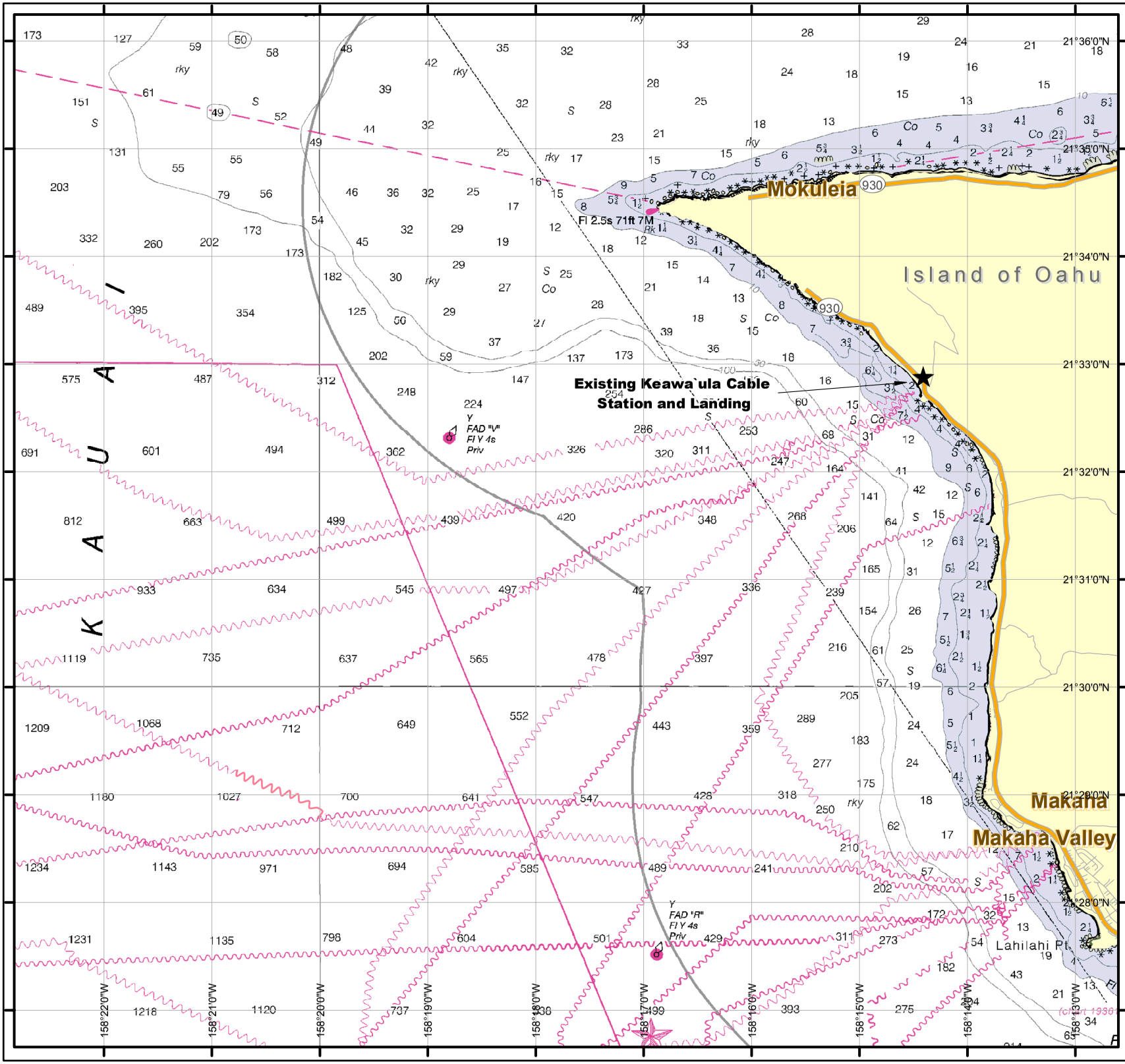
Similarly, the technical approach to the project is consistent with prior installations at this landing location, and the Australia-Hawaii cable will be routed within the same nearshore corridor on submerged land as the existing nine cables at the site. The cable will be routed through gaps in the inshore section of the reef currently occupied by existing cables, which avoids or reduces new contact with the seafloor.

2.2 Purpose and Need for the Project

The purpose of the project is to contribute to the upgrading of telecommunications between Australia, Hawai‘i and other countries of the Pacific region, in response to rapidly increasing demand.

Currently, the only submarine cable that directly links Australia and the United States is the Southern Cross Cable. The new Australia-Hawaii Cable System, therefore, will increase and

[1] Of the nine cables presently located at the Keawa‘ula landing, four are out of service (OOS) cables.



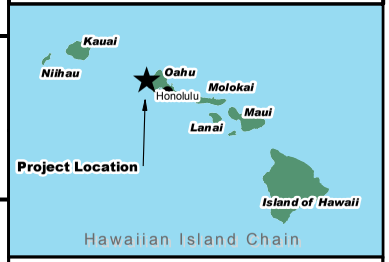
Legend

Existing Submerged Cables

Map Scale: 1:85000

0 0.3 0.6 0.9 1.2 1.5
Nautical Miles

0 0.75 1.5 2.25 3
Kilometers



Data Sources

Chart Data: NOAA RNCs™ - NOAA Raster Navigational Charts, Retrieved March 14, 2007
http://chartmaker.ncd.noaa.gov/mcd/raster/download.htm

Base Data: (Roads, Place Names) ESRI, 2006

Geodetic Parameters

Datum: WGS84 Projection: Mercator
Spheroid: WGS84 Coordinate System: GCS_WGS_1984
False_Easting: 0.000000
False_Northing: 0.000000
Central_Meridian: 0.000000
Standard_Parallel_1: 0.000000
Semimajor Axis: 6378137.000000
Semiminor Axis: 6356752.3142451793
Inverse Flattening: 298.257223563
Prime Meridian: 0.000000

FIGURE 2-1

Project Location

amec

DATE: 22 JUN 07	AUTHOR: LRK (Honolulu)
COMMENTS: None	REV: DMT (San Fran.)

FILEPATH: hnl-fs1/hazmat/projects/Alcatel Subamrine Cable/DWG/GIS/Maps/Figure 2-1 Existing Keawa`ula Cable Station and Landing.mxd

Source: Alcatel-Lucent 2007.

EA

Existing Infrastructure at Project Site

FIGURE
2-2

improve international connectivity and reliability on this important route. This new cable system will provide extra capacity for the increasing amount of international traffic required by the growing number of home and business broadband users. Businesses and consumers will benefit from enhanced capacity and reliability on this new cable system to enjoy innovative services such as telecommuting, video conferencing, advanced multimedia and mobile video applications. Equally important, the addition of the Australia-Hawaii Cable System into the international telecommunications infrastructure will add a new layer of redundancy to telecommunications networks linking the United States and Australia, thereby reducing the potential for call failures during natural or other disasters, a critical component to strengthening homeland security.

The backdrop of increased demand for trans-Pacific capacity played an important role in the Australia-Hawaii project design for the Keawa‘ula landing. The project is to install a single cable at this landing, using vacant infrastructure, consistent with the successful installation and operation of the existing cables at the landing.

A further technical consideration is the planned installation of another system at the Keawa‘ula landing, the Asia-America Gateway (AAG), which would install two additional fiber-optic cables at the same landing point. Therefore, an additional project objective is to *minimize beach and community disturbance for the Australia-Hawaii and AAG systems combined*.[2]

2.3 Background on Cable Technology and Route Planning

Although the first subsea (or “submarine”) telegraphic cable systems were operational in the late 1800s, modern fiber optic cables are capable of delivering much greater speed, capacity and reliability than earlier systems. The evolution of these systems has been reviewed in recent documents evaluating similar fiber optic cable projects in the project area.[3] The Australia-Hawaii system can deliver a capacity of 1.28 Terabits per second, or the equivalent of approximately 18 million simultaneous telephone calls.

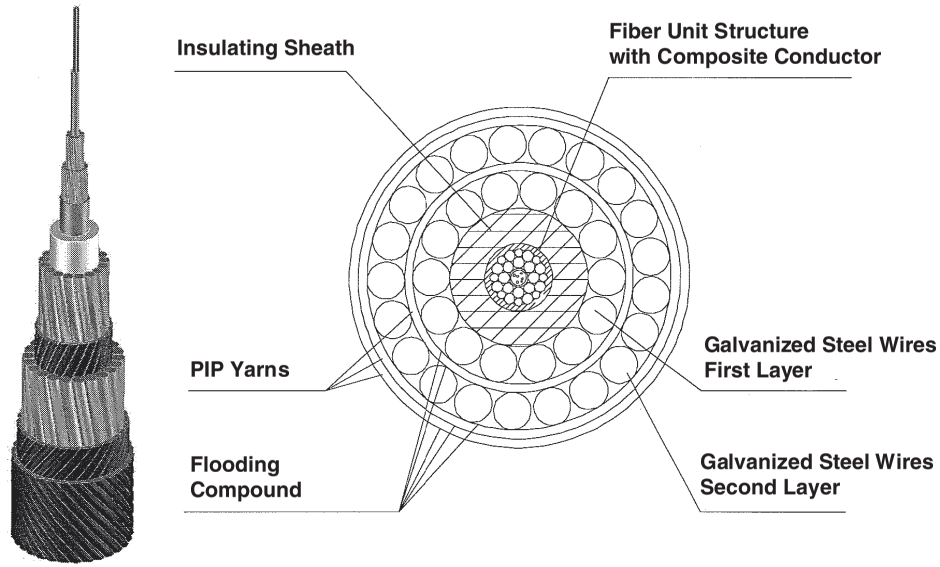
---

[2] The Australia-Hawaii and AAG systems are independent projects. However, because they are expected to share a common landing point, a key project objective for the Australia- Hawaii project is to develop an approach that will reduce the combined disturbance of the two installations to the beach and to the local community.
[3] See also environmental assessments for the Japan-US Cable Network (1999), Tyco Global Network (2001), and Sandwich Isles Communications (2004).

The proposed cable route has been chosen based on results of detailed investigations and surveys, and will consist of approximately 9,000 km (5,592 mi) of cable between Sydney and O‘ahu. The proposed cable is an optical fiber subsea cable, designed and incorporating materials to minimize environmental impact. The cable design can accommodate up to six pairs of fibers, which are housed in a jelly-filled stainless steel tube, surrounded by two layers of steel wires that form a protective vault against pressure and external contact, and also provide tensile strength. This vault is then enclosed in a hermetically sealed copper tube and insulated with a layer of polyethylene to form the basic deep-sea Light Weight (LW) cable. The outer low-density polyethylene coating provides high voltage electrical insulation, as well as abrasion protection. Whenever possible, the raw materials selected are of the same type as those used in previous generations of coaxial and optical fiber cables, which have demonstrated more than 20 years of reliability. This basic LW cable is generally used in waters greater than 3,500 m (11,500 ft) deep and is 17 mm (0.67 inches) in diameter. Figure 2-3 is a diagram of the type of cable proposed for this project.

Because these cables are installed for an operational life of approximately 25 years on or beneath the seabed, the design incorporates features to protect the cable from the marine environment, and external forces it may encounter during installation and operation. In shallower waters, additional protection is provided by addition of galvanized steel armor wires. Single Armor (SA) cable is made by stranding a single layer of high strength galvanized steel wires over the basic lightweight (LW) cable structure. The steel wires are saturated with bituminous compound and covered by polypropylene yarns. This cable is normally used where full protection by burial is possible. It may be used at any water depth between 0 and 1,500 m (4,920 ft), or down to 2,000 m (6,560 ft) in special conditions. SA cable is 26 mm (1.02 inches) in diameter.

In very shallow waters, Double Armor (DA) cable can be used. DA cable is made by adding a second layer of galvanized steel wires around the SA cable, saturated with bituminous compound and covered with polypropylene yarns. This cable is normally used for surface lay or to add additional protection where burial was originally thought to be possible. It may be used at any water depth between 0 and 500 m (1,640 ft) but is generally used between 0 and 200 m (656 ft). DA cable is 35 mm (1.38 inches) in diameter.



Source: Alcatel-Lucent 2007.

EA

Double Armoured (DA) Cable Arrangement

FIGURE
2-3

Where cable stability and protection require it, articulated pipe may be fitted over the cable. Articulated pipe is applied by divers, so the maximum deployment depth is usually 20 m (66 ft). The pipe has a diameter of 76 mm (3.00 inches).

Cable design and selection of cable type are developed in the planning stages based on engineering considerations identified during the route planning process. The routing at the landing was selected to optimize the approach to the existing infrastructure, to minimize interference with existing cables, and to use the seafloor features that effectively function as a natural corridor for the cable route.[4] The process and techniques used in route planning are described in Chapter 2.4.1, below.

2.4 Proposed Action

The project consists of the following elements:

- Cable installation by main lay vessel;
- Shore End landing through to BMH; and
- Commissioning and operation of the system.

Each of these project elements is described below.

2.4.1 Main Lay Cable Installation

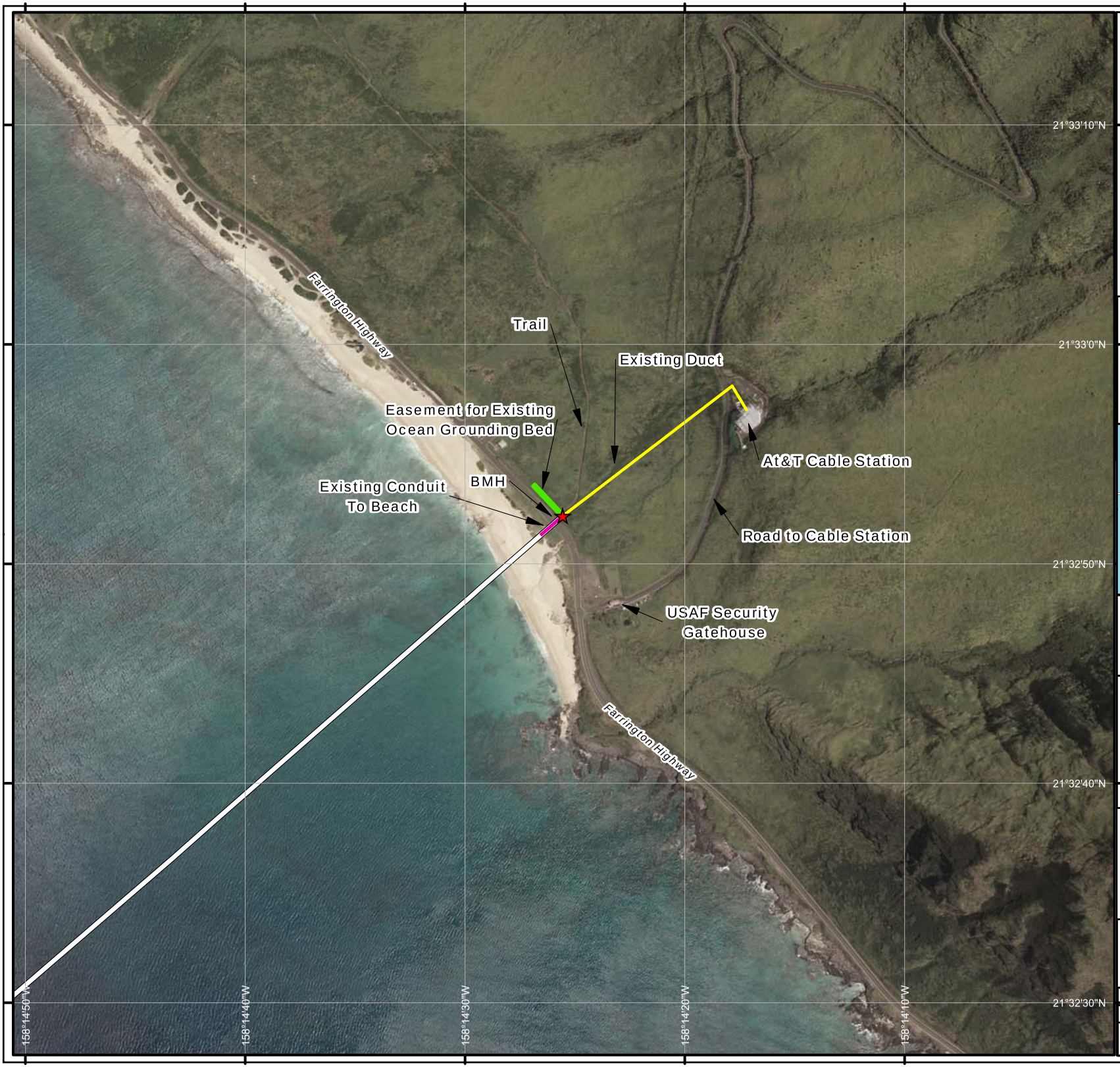
Main lay cable installation will involve laying the cable along a pre-determined route using special-purpose cable ships.

Cable Route – The routing is designed to avoid potential hazards, disruption to marine resources and operations, and to secure long-term protection of the cable. The project route, as shown in Figure 2-4, is situated among the existing cables already installed at the landing point.

The cable route and project design are refined through two main stages:

- Desktop Study (DTS) – detailed review of all factors affecting the routing of the cable, including physical, environmental, socioeconomic and regulatory aspects; and

[4] There are natural and man-made gaps in the rock where the existing cables are placed. The Australia-Hawaii cable route will use these features to minimize impact to the seabed.



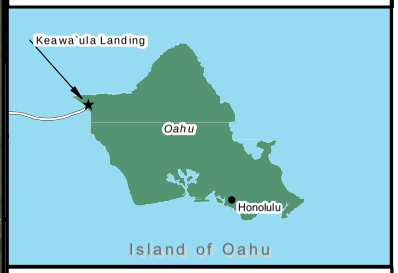
Legend

- Man Hole Location
- Existing Duct
- Existing Conduit to Beach
- Easement for Existing Ocean Grouding Bed
- Proposed Cable Route

Map Scale: 1:7,000

0 200 400 600 800 1,000
Feet

0 50 100 150 200 250
Meters



Data Sources

Proposed Cable Route: Alcatel Inc. (PSR11prov, 17 JUN 07)

Chart Data: NOAA RNCs™ - NOAA Raster Navigational Charts, Retrieved March 14, 2007
http://chartmaker.ncd.noaa.gov/mcd/raster/download.htm

Base Data: (Roads, Place Names) ESRI, 2006

Geodetic Parameters

Datum: WGS84 Projection: Mercator
Spheroid: WGS84 Coordinate System: GCS_WGS_1984
False_Easting: 0.000000
False_Northing: 0.000000
Central_Meridian: 0.000000
Standard_Parallel_1: 0.000000
Semimajor Axis: 6378137.000000
Semiminor Axis: 6356752.3142451793
Inverse Flattening: 298.257223563
Prime Meridian: 0.000000

FIGURE 2-4

Nearshore Cable Route & Landing Site

amec

DATE: 18 JUN 07	AUTHOR: LRK (Honolulu)
COMMENTS: None	REV: DMT (San Fran.)

PATH: hnl-fs1/hazmat/projects/Alcatel Subamrine Cable/DWG/GIS/Maps/Figure 2-4 Nearshore Cable Route and Landing Site .mxd

- Cable Route Study (CRS) – separate surveys for the inshore and deep-water sections. Bathymetric and other data are collected and analyzed in order to define the precise optimum route for cable installation.

Cable-laying Vessels – The Australia-Hawaii cable will be laid by a number of cable ships between Sydney and Keawa‘ula. One of these ships will lay the cable through Hawai‘i’s territorial waters, including the shore-end landing at Keawa‘ula described in Chapter 2.4.2 below. The ship will be approximately 140 m (420 ft) long, and will have a dynamic positioning (DP) system that enables it to maneuver in the nearshore area without anchoring, as noted in the discussion of the Shore End landing. Smaller boats are typically required to assist the cable ship during the Shore End landing operation. There will be one or two support boats, size depending upon availability of the boats, but they would typically be approximately 5 to 9 m (18 to 30 ft) in length.

The cable ship will comply with applicable regulations and international conventions addressing navigational safety, safe operations, and pollution prevention measures. The location and duration of the vessel’s presence in the project area will be included in a notice submitted in advance, in accordance with U.S. Coast Guard (USCG) requirements, so the USCG can issue a notice to mariners and alert other vessels of its presence, expected time in the project area, and contact information.

The main lay will be conducted 24 hours per day until the ship reaches shallow water from where the Shore End landing operation is carried out. During the main lay, the ship will operate at a speed of approximately 4 knots as it approaches O‘ahu. From the point of entering U.S. territorial waters (at the 12 nautical mile [nm] limit), the duration of the main lay operations will be approximately one day to approach the Keawa‘ula landing. Once off the landing location, the cable ship will wait for daylight hours and suitable conditions (calm weather and minimal swell) before initiating the shore end landing operations.

The main lay and landing are scheduled for February 2008.

2.4.2 Shore End Landing

The Australia-Hawaii Shore End at Keawa‘ula Beach will be landed directly from the cable ship.

The Shore End landing will consist of the following key activities:

- Beach preparation and equipment staging;
- Cable landing operation;
- Cable pull to BMH;
- Placement on seafloor and application of cable protection where required; and
- Post-landing operations, including beach burial and restoration.

It is proposed that the Shore Ends for the separate AAG Cable System (Chapter 2.2 refers) will also be installed at the same time. Two AAG cables will be landed to the same BMH immediately following the Australia-Hawaii cable landing. Although this project is evaluated in a separate environmental assessment and permitting process, installation of the AAG cables is mentioned in this description because the two installation processes are being coordinated to reduce disruption and impact to the project area.

The general layout for beach activities is shown in Figure 2-5.

2.4.2.1 Beach Preparations

Prior to commencing the Shore End landing, the beach and BMH area will be prepared.

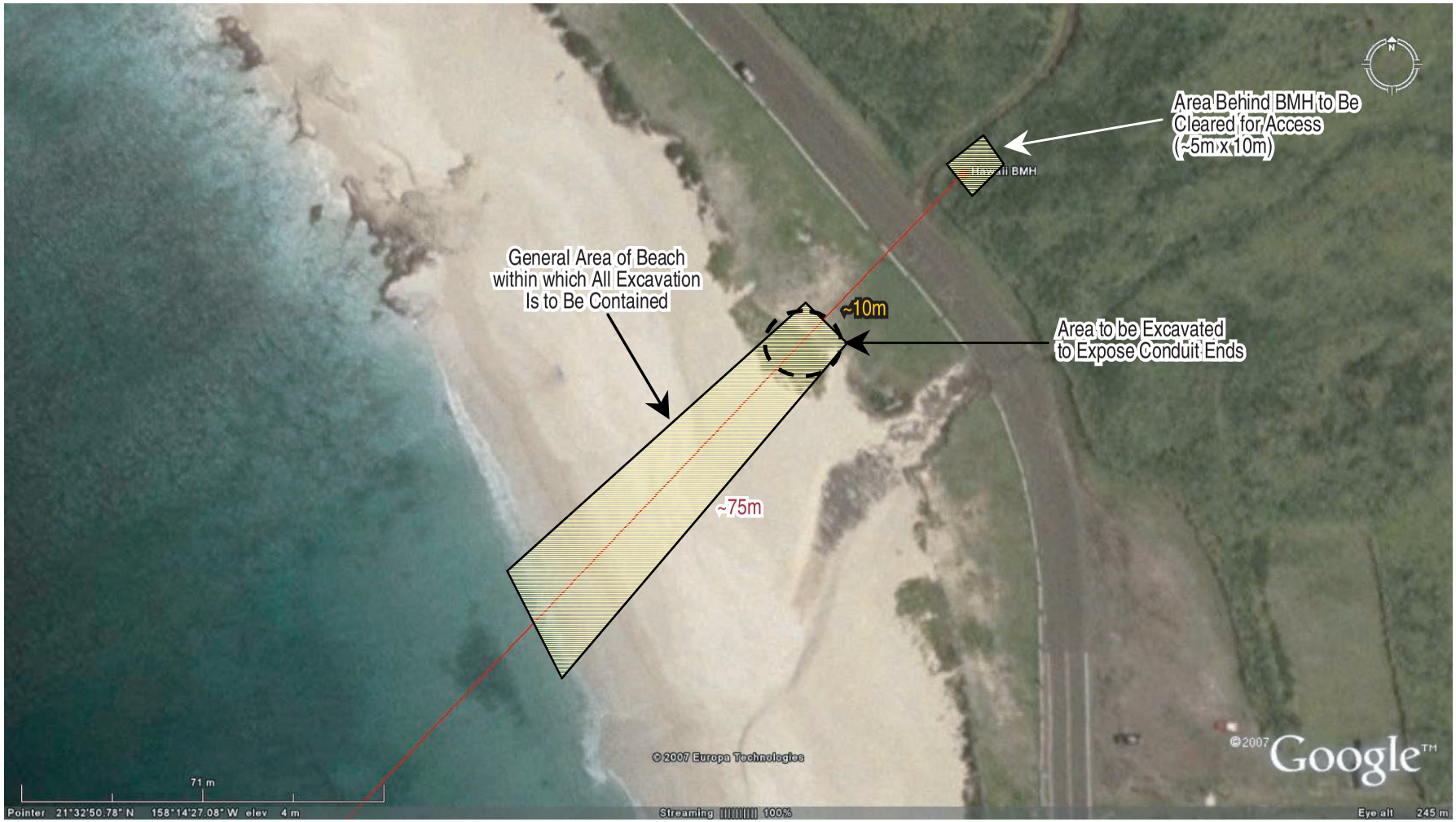
The first operation will be to locate and positively identify the existing in-service cables crossing the beach. There are also four out-of-service cables (OOS) in the area. These cables will be identified using specialized cable detection equipment and localized digging as necessary to validate cable detection.

Equipment and Materials
- Excavator
- Winch
- Shovels, hand tools
- Cable detection equipment
- Hauling ropes, floats
- Work boats

An area will be excavated at the top/back of the beach, exposing the beach end of existing conduits coming from the BMH. It is expected that this excavation will be around 2 m (7 ft) deep. Vegetation around the BMH will be trimmed, but not uprooted, to access the BMH. See Figure 2-6.

There are six 6-inch-diameter steel conduits coming from the BMH, with a length of 43 m (138 ft). One of these conduits is free, and will be used to install the Australia-Hawaii cable. Another conduit that is currently occupied by an OOS cable will be cleared to allow the installation of the AAG shore ends immediately after the Australia-Hawaii cable has been installed.

Digging on the beach will be primarily by small mechanical excavator, but some digging will be performed by hand when operating near the existing in-service cables to minimize the risk of damage.



Source: Alcatel-Lucent 2007.

EA

Layout of Shore End Beach Activities

FIGURE 2-5

Source: Alcatel-Lucent 2007.

EA

Typical Excavation at Conduit Ends

FIGURE 2-6

Also before the landing, the excavator will be positioned on the grass area on the seaward side of the Farrington Highway, to be used as a deadweight holding-point for the cable-hauling winch. The winch will also be positioned on the grass area, seaward of the excavator but landward of the end of the conduit exit point. By using the excavator as a deadweight holding point, no excavation to the landward side of the conduit will be necessary, thereby minimizing the project footprint. See Figure 2-7 for the arrangement of the beach equipment, and an example of a similar set-up at a highly-used public beach.

Floating hauling ropes will be positioned in readiness for the hauling operation.

The worksite will be cordoned off from public access using safety fencing. Markers and site control on the beach will identify and maintain a safe work area, without the need to close the entire beach area to users. Security will be provided for equipment that may be staged overnight.

Farrington Highway will not be affected by this cable landing set-up and will therefore remain safely open to public use throughout all operations.

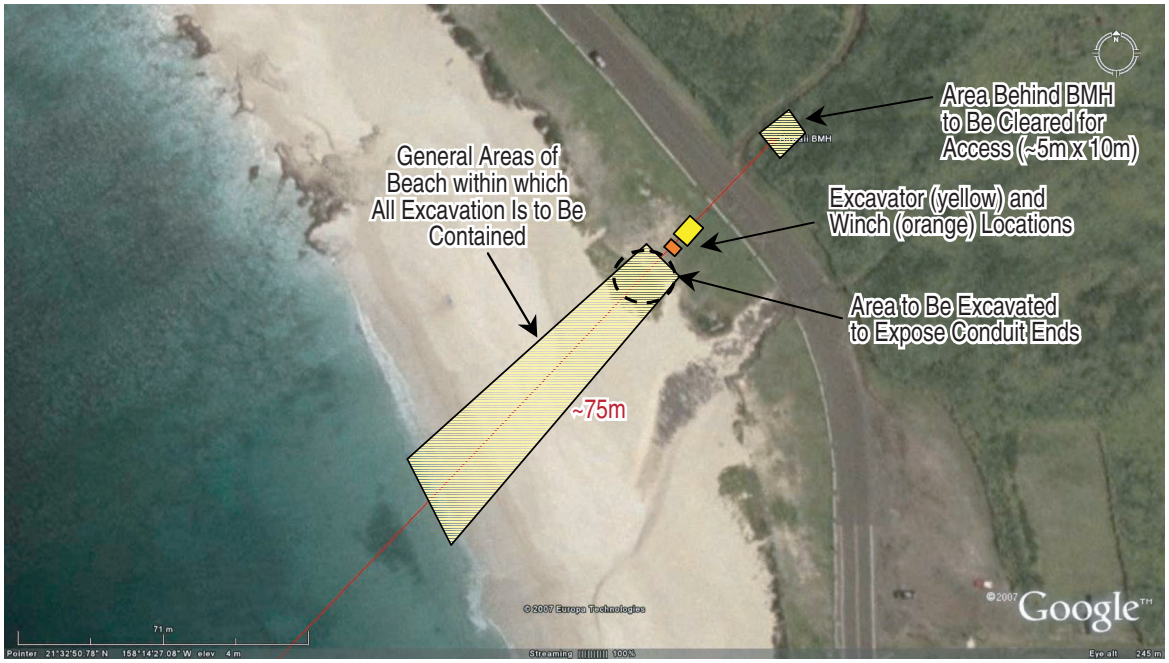
2.4.2.2 Cable Landing Operation

Before the landing, the cable ship will arrive laying cable from her stern, heading in towards the beach. When the cable ship arrives a safe distance offshore (expected to be at the 15 m [49 ft] contour, approximately 1000 m [3281 ft] offshore), the vessel will stop laying, and turn through 90° to be perpendicular to the route, and parallel to the beach. On the offshore side she will be still holding on to the cable running into deepwater, while the inshore side will be used to land the shore end cable. She will maintain position using her DP system, so no anchoring is expected to be required. The crew onboard will prepare the Australia-Hawaii cable end for the landing.

Vessels and Divers
- Cable ship: 140 m
- No anchoring
- Support boats: 1-2
- Divers, landing: 1-2
- Divers, post-lay: 4-5

The landing operation will be conducted during daylight hours, with operations usually commencing around 06:00 am local time.

On the day of the Shore End landing the following staff and positions will be in radio contact: the Beachmaster at the hauling position ashore, the Dive Master on the dive support vessel, the



Equipment Layout on Beach

Example of Similar Arrangement on a Public Beach

Source: Alcatel-Lucent 2007.

EA

Beach Equipment Layout

FIGURE 2-7

commander of the cable ship on the vessel's bridge, as well as any work boat crews. The communications will be tested before operations begin.

A light hauling line will be run from shore, through the surf zone, out to the cable ship. This line will be used to pull a heavy hauling line ashore. Once the hauling line is ashore the cable will be attached to the shipboard end. The landward end of the hauling line will then be secured to the winch.

The winch will slowly take up, pulling the hauling line. The ship will simultaneously pay out the cable, allowing it to be pulled ashore. Tension will be monitored at both the winch and cable ship. As the cable is paid out from the cable ship, floats will be attached as necessary (usually every 3-5 m [10-16 ft]). These floats are tied to the cable using short lengths of rope, and are usually less than 30 cm (12 inches) long. As the floats reach the shore line they will be removed from the cable and returned to the cable ship by a work boat. See Figure 2-8.

Hauling operations will continue until sufficient cable is ashore to reach the BMH, including enough slack for jointing and testing (usually 25 m [82 ft]). Additional "beach slack" (usually 25m [82ft]) may also be pulled ashore to allow manipulation of the cable by divers offshore, if required. As the cable end is pulled ashore, the shore team will continue to pull the cable until all the remaining shore-end cable onboard the ship is paid overboard. The final heaving from the shore will straighten the cable out, and the ship will lower the cable to the seafloor. The cable will then be released and the ship will move away to deeper water. Refer to Figures 2-9 to 2-12.

Once the cable end is secured ashore, the hauling rope will then be disconnected and the cable end opened up for electrical insulation and fiber tests. As soon as the tests are completed, divers will be instructed to start trimming the remaining cable floats. Before this commences, efforts will be made to make the cable line as straight as possible. Due to currents and wind, a bow, or bight, may occur in the cable between the ship and shore. Usually some slight tension applied from either end will straighten the cable line.

The floats will be cut away progressively from the shore line towards the cable ship. As the divers cut the floats, the cable will fall into its desired position. The divers will confirm the cable is lying flat on the seabed in an acceptable manner and position, and where possible may

Cable with Floats Deployed from Cable Ship

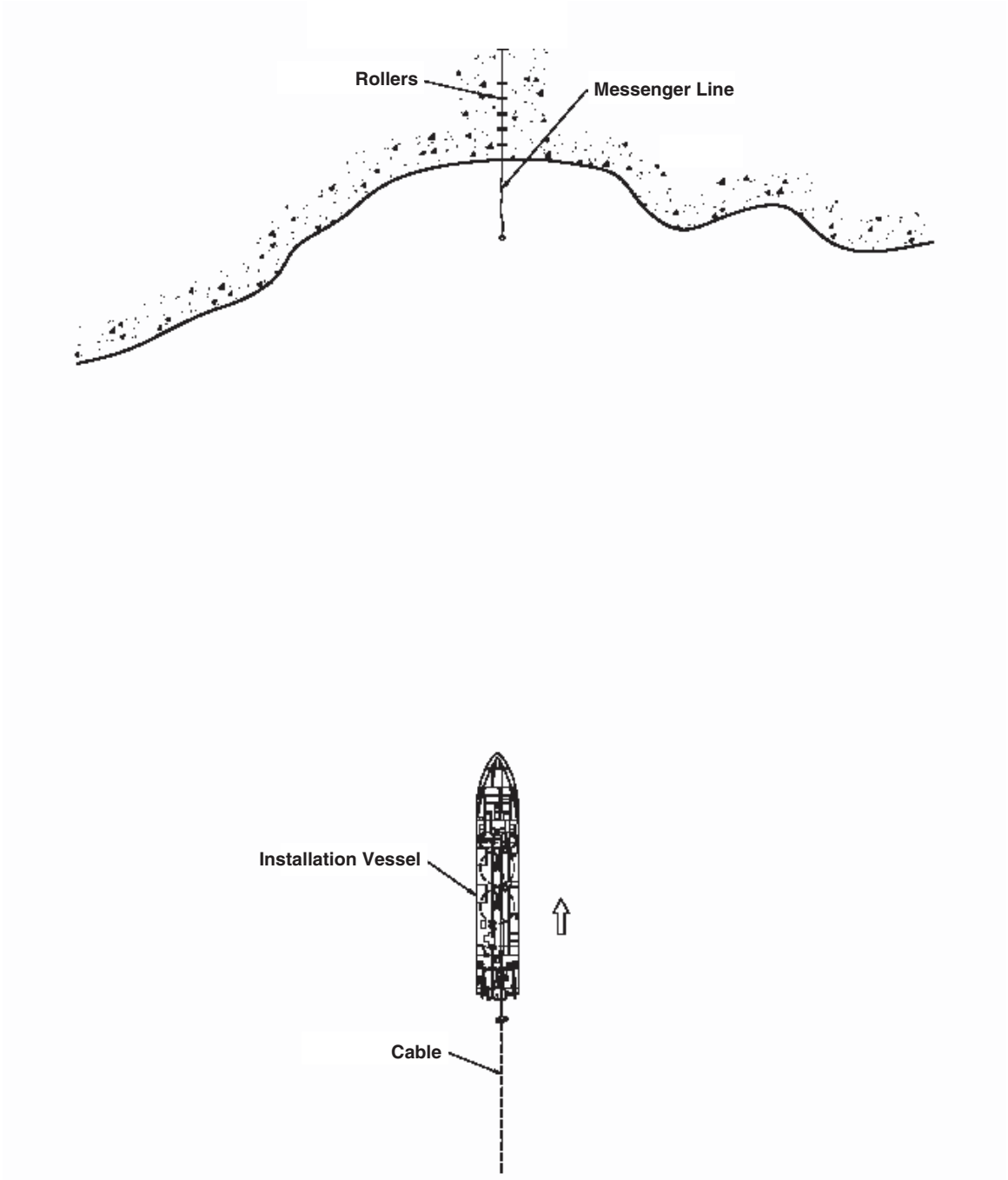
Cable End Being Floated Ashore

Source: Alcatel-Lucent 2007.

EA

Typical Landing DIrectly from Cable Ship

FIGURE 2-8

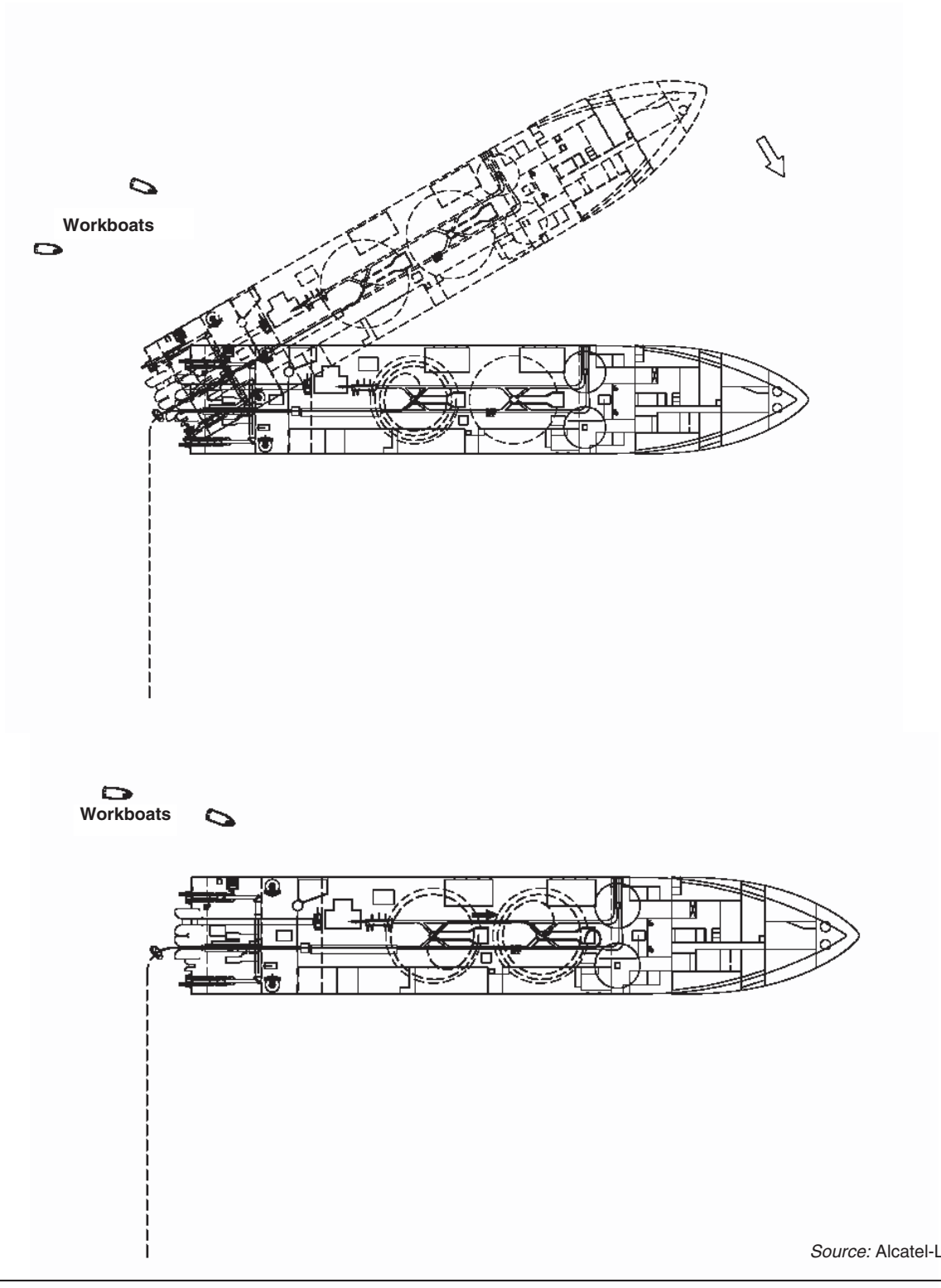


Source: Alcatel-Lucent 2007.

EA

Vessel Approaching Landing

FIGURE 2-9

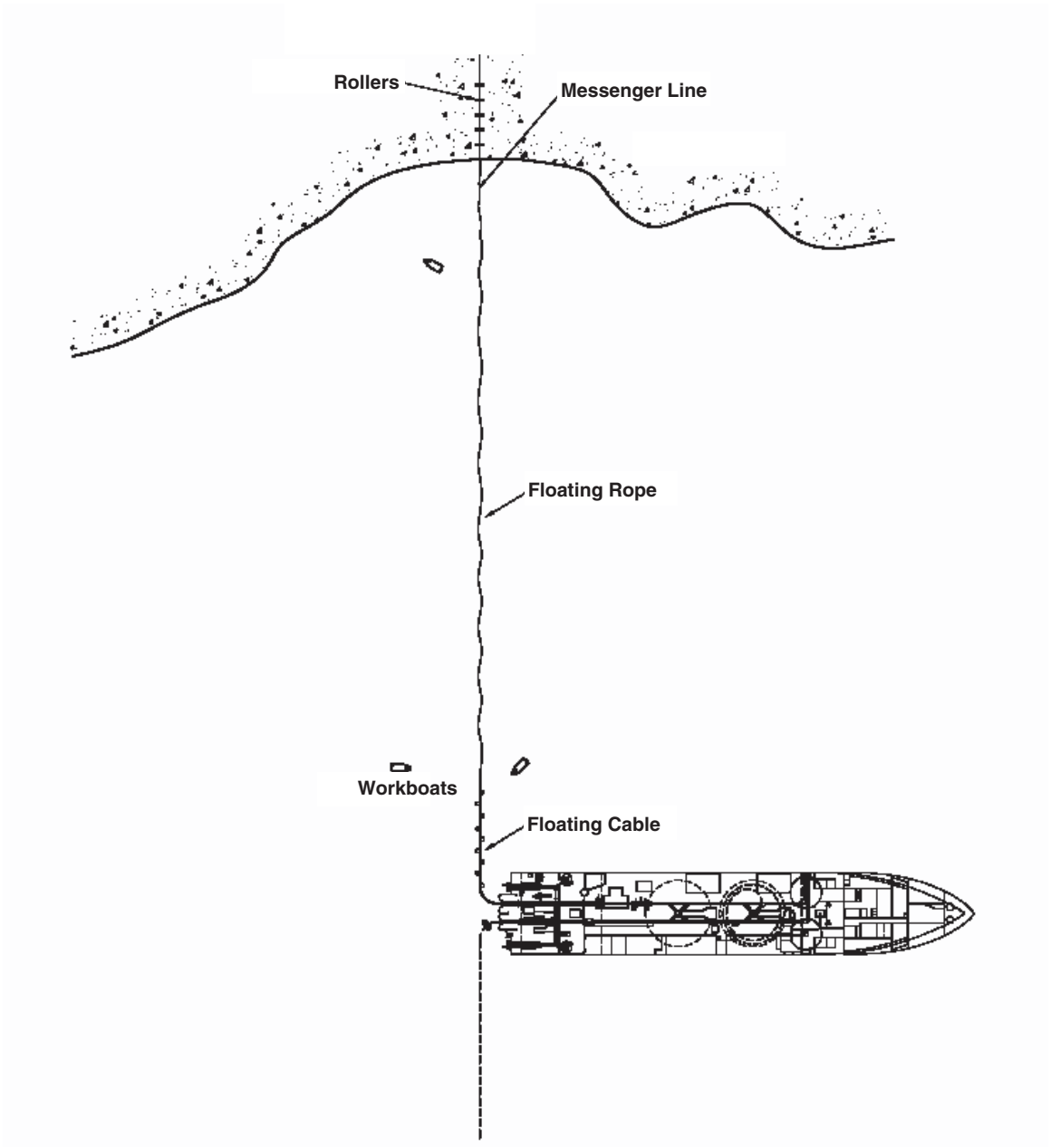


Source: Alcatel-Lucent 2007.

EA

Vessel Turns Perpendicular to Cable Line

FIGURE 2-10

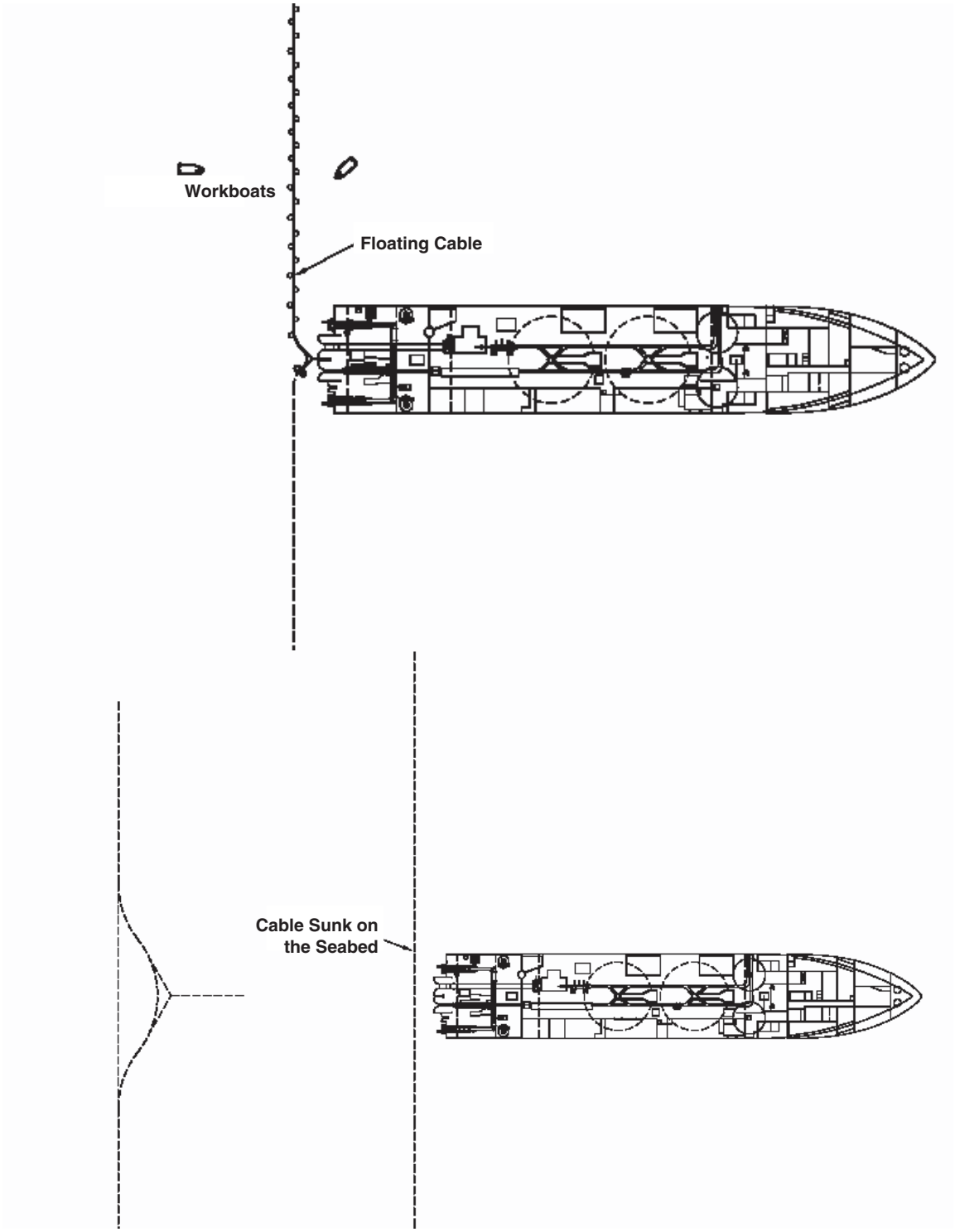


Source: Alcatel-Lucent 2007.

EA

Payout of Cable from Ship to Beach

FIGURE 2-11



Source: Alcatel-Lucent 2007.

EA

Cable Floated Ashore and Vessel Is Released

FIGURE
2-12

manually reposition the cable if required. Specifically for the Keawa‘ula landing, the divers will direct the cable through the inner reef gaps, as detailed previously.

Once the cable is laid onto the seabed, the cable end, currently on the beach, will be fed up the ducts to the BMH. Should the initial positioning of the cable onto the seabed result in minor irregularities in the lay of the cable, some of the 25 m (82 ft) of beach slack will be walked out along the cable line by divers, in order to provide some excess cable to allow adjustment of the lay-down position of the cable.

Once inside the BMH, the cable armor wires will be anchored inside the BMH, and the beach joint will then commence. This operation is expected to conclude by late morning. The two AAG cables, which are a separate project, could also be completed on the same day, or on the following day as needed, depending on the weather and swell conditions remaining suitable.

2.4.2.3 Post Landing Operations

On the beach, once the cables have been fed into the conduit to the BMH, articulated pipe will be applied over each cable, from the conduit end to offshore. See Figure 2-13. A trench will then be excavated from the existing excavation at the end of the BMH conduits down to the waterline to bury the cables. Figure 2-7 shows the location of this area on the beach. While the exact depth will be dependent on the location of the existing cables, and the subsurface conditions underlying the cables, the planned depth of the trench across the beach will be 2 m (7 ft). The estimated amount of sand to be excavated is approximately 150 cubic yards.

The cables will be positioned in the bottom of the trench. All excavations will then be back-filled and the beach returned to its former condition. No sediments will be removed from the project area, nor will materials be introduced to the beach to fill the excavated area.

An excavator will be used to bury the cable as close as possible to the low water mark, and self-burial of the cable is expected to occur through the surf zone. Otherwise, in areas where self-burial has not occurred, jet burial into the seabed by divers out to the 3 m (10 ft) water depth contour will be carried out where possible and where adequate sediment is present.

Articulated pipe will continue to be applied not only across the beach, but also to a distance of 200 m (656 ft) offshore (about 6 m [20 ft] water depth). This is consistent with the existing cables at the landing, as shown in Figure 2-14.

Source: Alcatel-Lucent 2007.

EA

Articulated Pipe Applied over Cable Across Beach before Burial

FIGURE 2-13

Source: Alcatel-Lucent 2007.

EA

Existing Cable in Articulated Pipe at the Keawa‘ula Landing

FIGURE 2-14

An ocean grounding bed (OGB) will be installed at the cable station, and will not affect the beach or Shore End installation area.

2.4.2.4 Duration of Shore End Activities

The expected duration of the installation Shore End activities are noted below, and an estimated breakdown of duration by activity is shown in Table 2-1.

Table 2-1. Duration of Shore End Landing Activities

Activity	Duration (days)
Beach preparation, equipment staging	3
Shore End landing	1 to 3
Post-landing operations	1 to 3
Beach completion and restoration	1
Total Duration	6 to 10

Day 1-3: Mobilization of equipment and preparation of the beach. This includes delivery of the winch, and the initial excavations to expose the ducts from the BMH and to locate the existing buried cables down to the high water mark.

Day 4-6: The landing operations for the Australia-Hawaii cable and the two AAG cables are expected to take one day only, if conditions remain favorable throughout the day. If conditions deteriorate (e.g. wind/swell), then a separate day per landing is anticipated.

Day 7 to 9: Repositioning of cables offshore using beach slack, as necessary, and application of articulated pipe from duct end, across the beach and out to 200 m (656 ft) offshore on all three cables, the single Australia-Hawaii cable and two AAG cables.

Day 10: Burial of all three cables to 2 m (7 ft) across the beach, with jet burial from low water mark (LWM) to 3 m (10 ft) water depth where self-burial has not occurred and where sediment exists. Backfilling of burial trench to restore beach to original condition and allow full public access to the beach to be restored.

All the above durations are dependent on weather and swell conditions.

2.4.3 Operation

Once installed, the cable requires no routine maintenance. The existing cables at Keawa‘ula, for example, have remained in place since installation and have required no maintenance or repair.[5] In the unlikely event of a repair being required, this would be done using similar equipment and techniques as installation, in the water and on the beach.

2.4.4 Best Management Practices and Mitigation Measures

The project has been designed and planned to achieve the installation with minimal disturbance to coastal and marine resources and users. Best management practices and industry standards fundamental to the design, installation and operation of systems like the Australia-Hawaii system are summarized in Table 2-2.

Table 2-2. Best Management Practices

Project Element	Best Management Practices
Route Planning	• Desktop studies and cable route surveys to assess site-specific conditions and areas to avoid. • Adherence to industry standards, including the International Cable Protection Committee (ICPC) guidelines for routing.
Main lay Operations	• Maritime law and practices related to ship movements. • Safe operating procedures. • Trained crews and operators. • Use of navigational equipment, procedures and communications with other marine users, including but not limited to communications with the U.S. Coast Guard. • Vessel pollution prevention (refuse and oil/chemical releases) required by international and U.S. federal laws.
Shore-end Landing	• Maximized use of existing infrastructure. • Trained crews and divers. • Detailed procedures, plan of work and daily reports documenting activity. • Site safety and spill prevention plans. • Planned and frequent communication between ship and shore crews. • Establishment and enforcement of safe distances from equipment, and designated work areas. • Advance communication with appropriate agencies and local authorities. • Site access control. • Maintain clean work area and remove project-related refuse at the end of each day.

[5] James Murray, AT&T 2007.

Mitigation measures have been developed to avoid or reduce impacts during installation of the cable. Mitigation measures are identified in Chapter 4 in the respective discussions of potential impacts by resource area, and are summarized in the Executive Summary.

2.4.5 Project Schedule and Cost

The landing operation in Hawai‘i is currently scheduled for February 2008.

The estimated cost of the project is $200,000.00.

CHAPTER 3: ALTERNATIVES CONSIDERED

This section addresses alternatives considered in the development of the Australia-Hawaii project, including the No Action alternative.

3.1 Alternative Development

3.1.1 Landing Site and Route Selection Criteria

Selection of the landing site and marine route requires intensive review and evaluation of physical, regulatory and commercial information. The landing site must provide:

- Access to telecommunication markets and users, either directly or through interconnection with other subsea networks;
- Access to onshore infrastructure that will minimize the need for additional construction and infrastructure development; and
- A location where the subsea cable can feasibly be landed, with due regard for long-term cable protection, safety and environmental considerations.

The selection and optimization of the marine route in the approach to the landing site is a process that takes account of numerous considerations, including the following:

- Access to the selected landing site;
- Seabed characteristics;
- Bathymetry;
- Restricted areas, such as marine sanctuaries and military operation areas;
- Sea uses in the project area, including recreation and fishing;
- Sensitive habitats and resources;
- Natural and man-made hazards;
- Cultural resources such as shipwrecks; and
- Regulatory and permitting requirements.

When available, cable fault history is also considered in project design and planning. At Keawa‘ula, where cables have been installed and operated since 1985, fault history is useful to assess whether the installation techniques used on previous installations have provided adequate protection for the cables. As noted previously, AT&T reports there have been no faults at this location.

At the route planning stage, information is obtained from agency contacts, databases, site visits and route surveys to identify and validate information critical to planning the route and landing. The route survey for the Australia-Hawaii system included side-scan sonar and video surveys of

the nearshore area, and a biological survey to obtain site-specific data used in refining the route and landing.

3.1.2 Shore-End Landing Considerations

The development of beach landing techniques includes consideration of:

- Existing infrastructure and beach access area(s);
- Nearshore bathymetry;
- Seafloor profile and characteristics;
- Presence of rock, sediment, corals, existing cables, and other features;
- Seasonal conditions affecting sediment transport, wave energy and working conditions;
- Sensitive habitats and cultural resources;
- Beach and nearshore uses; and
- Work area "footprint" and duration as they affect disturbance to resources and users.

3.2 Alternative Landing Sites

Because there are established cable landings and onshore infrastructure available on O'ahu, only existing cable stations and landings were considered as a means of avoiding new construction. The Makaha cable landing and station are located approximately 8 km (5 mi) south of the Keawa'ula site on the Wai'anae coast. Like the Keawa'ula location, Makaha has existing infrastructure and an operating cable station. It is the landing point for 10 existing cables, of which five are out of service, and two planned cables.[1]

Telstra selected the Keawa'ula cable station and landing site over Makaha because of the combination of available capacity and landing services at the Keawa'ula location.

3.3 Alternative Installation Methods

The project proposes a direct landing method for installing the Australia-Hawaii cable, and plans to incorporate the installation of the two AAG cables during the same installation period[2] to reduce total beach disturbance. This technical approach is consistent with prior landings at the project location, and is the most common technique used in the industry throughout the world. Other techniques were considered during the development of this project. They are:

---

[1] The Sandwich Isles Communications system is expected to install two cables at the Makaha landing.
[2] The AAG cable installation is independent of the Australia-Hawaii project, and would require separate review and approval from this project. However, because they share a common landing point and approximate installation schedule, the two project teams are coordinating their efforts to minimize overall construction-related disturbance.

- *Direct landing of the Australia-Hawaii cable followed by later separate installation of the AAG Cables* – The Australia-Hawaii cable would be installed across the beach to the existing conduit, and pulled through the conduit to the BMH. The trench from high water mark to the existing conduit end would be the same as that for the preferred method. Future cable landings would be conducted as separate events.
- *Direct landing with "bundled" shore-end cables* – In anticipation of subsequent cable installation, three shore-end cables would be bundled together for installation so only one beach installation would be required. Only the Australia-Hawaii cable would be fully installed and operational. The remaining two cables would be installed only to a water depth of approximately 25 m (82 ft) from the landing point, and would remain unconnected and non-operational unless and until AAG or another project proceeds to complete the installation.
- *Direct landing of the Australia-Hawaii cable with installation of additional ducts between the conduit end and water line* – In anticipation of AAG or another future cable installation, this approach would install ducts on the beach so the future cables could be installed at a later date without further significant excavation of the beach.
- *Horizontal directional drilling (HDD)* – The cable would be installed by boring under the beach area to a point offshore. The bore would originate near the existing BMH and exit offshore at approximately 25 m (82 ft) water depth, which is approximately 1 km (0.6 mi) offshore. Two additional bores would be constructed at the same time for AAG or other future systems.

These four options are reviewed in more detail in the following sections.

3.3.1 Direct Landing and Separate Installation of AAG Cables

This alternative is the most straightforward means of installing the Australia-Hawaii system because the cable could be laid directly in the beach along with the other existing cables, and no provision would be made for future installations. The effects of this approach would be similar to those of the preferred method. Installation would be slightly shorter in duration because there would be no need to install and bury additional cables.

This alternative was not selected because there is reasonable certainty that future cable systems, AAG in particular, will land at Keawa‘ula, requiring subsequent beach works. Therefore, this approach is not desirable because it does not attempt to avoid cumulative impacts of expected future activity at the project site.

3.3.2 Direct Landing with "Bundled" Shore-End Cables

This alternative would mitigate future beach disturbance by installing two "spare" shore-end cables with the complete Australia-Hawaii cable. At a later date, AAG or other future cable systems could be spliced to the spare shore-ends at an appropriate water depth (approximately 25 m [82 ft]), without having to disturb the beach or the nearshore area. The cables would be

bundled together as they are brought to shore and installed as a single action. As discussed under the first alternative, the effects of this alternative would be very similar to those of the preferred installation method.

This alternative was not selected because of technical and administrative concerns. From a technical standpoint, it is possible that the bundled cables would be more difficult to manage because of their combined weight and diameter when bundled. They could also twist during installation, complicating the post-installation cable protection measures and future maintenance if required. There is also the potential to create confusion about the permitting requirements if "spare" cables are partially installed. The additional cables would require separate permitting before becoming operational, and it is unclear whether such an approach would be acceptable to agencies with permitting authority because it would potentially create an administrative dependency between unrelated systems.

3.3.3 Direct Landing and Installation of Ducts Between the Conduit End and Water Line

Under this alternative, ducts would be installed extending from the end of the existing conduit to the water. The Australia-Hawaii cable would be installed as described under the preferred project. AAG (or other cables) could be installed at a later date without disturbing the full depth of the beach. This approach is similar to that proposed for one of the two landings of the TyCom Global Networks (TGN) system.[3]

Concrete anchors or similar structures would be used to maintain the ducts' position during times of the year when storms and sediment transport might scour the area near the ends of the ducts. Cables, with or without articulated pipe, are more flexible than ducts and typically self-bury in the sediments. Ducts would require some means of protecting the ends.

This alternative was not selected because the concrete anchors or other supports could be obtrusive or even pose a safety hazard to users of this popular beach. Constructing the new ducts, jointing them to the existing conduit ends and forming the concrete anchors at the water's edge would also make the landing operation considerably more complex and involve additional machinery operating on the beach, compared with the selected option. It would also lengthen the construction timescale on the beach and the period during which public access is restricted.

[3] The TGN system, which was approved but not installed, proposed two landings, one by direct landing and the second by HDD. The direct landing at Kahe Point Beach Park would have included a new BMH and two 5-inch diameter ducts on the beach, as described in the Final EA (2001).

There would be a small risk of the new ducts failing during the cable pulls to the BMH when the later cable systems arrived, requiring further excavation on the beach to remedy the problem.

3.3.4 Horizontal Directional Drilling

Installation using HDD was considered because this technique is used in some applications to avoid surface disturbance to roads, beaches, and other areas where trenching is problematic. HDD has been used successfully in cable installations where there is no existing landing site (and BMH), the distance across the beach or other sensitive area is sufficiently long that beach use would be precluded by direct landing, and subsurface geology is suitable to prevent release of drilling fluid into the marine environment through rock fissures during development of the bore.[4]

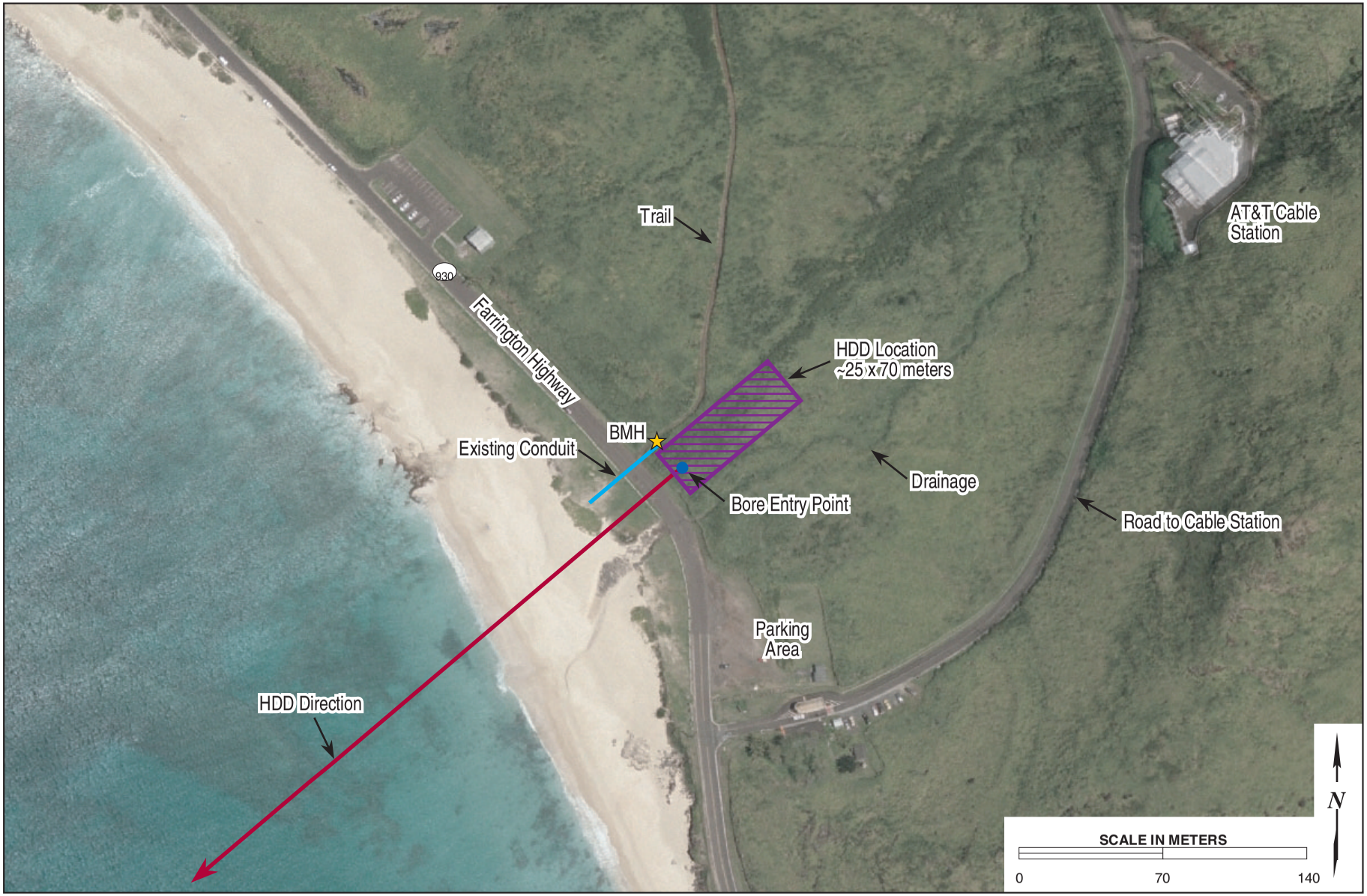
HDD was discussed during pre-application meetings with agencies on the Australia-Hawaii project. Recent projects have included HDD to avoid beach disturbance, and the technique has been considered by some agencies as generally a more favorable installation technique compared with direct landings.[5] One of the primary reasons for favoring HDD is the stated ability of the technique to limit most impacts inshore of the bore exit points, thereby avoiding disturbance to the beach and coastal resources. An HDD approach was therefore developed as an alternative for the Australia-Hawaii project.

HDD was evaluated as an alternative installation technique for the Keawa‘ula landing site by developing the site-specific technical requirements for this approach to determine the installation footprint, duration, and potential effects. HDD layouts from similar installations were used for these estimates, including an HDD operation completed in Sydney, Australia, seven years ago, one spare bore of which will be used for the Australian end of the Australia-Hawaii system. Figure 3-1 depicts a likely HDD work layout and footprint for the project site, and Table 3-1 presents key elements associated with this alternative.

Figure 3-2 shows HDD operations in progress for similar cable installations, including some of the key elements noted in Table 3-1.

---

[4] Such releases are called “frac-outs” and result when the fluid, typically a bentonite slurry, escapes through a fracture in the subsurface rock or substrate and is released into the water. This is of particular concern to reefs and areas of live rock because the bentonite, though typically non-toxic, can disperse and interfere with the organisms’ feeding and filtration mechanisms, or cause abrasion. See California State Lands Commission 2005 (Monterey Bay Accelerated Research System [MARS] Cabled Observatory System EIS/EIR), for example.
[5] DLNR Staff Report for Sandwich Isles Communications cable project, July 2004.



EA

Conceptual HDD Site Location and Footprint

FIGURE 3-1

View of HDD site in Sydney.

Rig in operation.
Pipe storage in foreground.

View of bore entry point.

Diesel storage for equipment, and
containment for spill prevention.

Source: Telstra 2007.

EA

Typical Site Setup for a Cable Landing HDD

FIGURE
3-2

Table 3-1. Elements of the HDD Alternative

Element	Description/Comment
Drill site location	Adjacent to BMH: • Drill site bounded by unpaved trail used for recreation • The area is vegetated and would need to be cleared (the clear area to the south is used locally for parking) • The area is on a slope and erosion protective measures would be required • The area is next to a natural fresh-water drainage channel that discharges to the ocean
Estimated bore length	Approximately 1 km (0.6 mi), to 25 m (82 ft) water depth contour
Drill site footprint	Approximately 1625 m^2 to 1875 m^2 (0.4 to 0.5 acres): • Estimate 25 m x 60-75 m (82 ft x 197-246 ft) • Footprint includes area for overburden and bentonite slurry management
Geology	• Would require survey to establish suitability of local geology (especially to avoid "frac-outs") • Unfavorable subsurface conditions may extend the duration of the boring operation.
Key activities	• Work site clearance and preparation • Equipment delivery and staging • Drilling fluid preparation, monitoring, and disposal • Drilling operation • Offshore bore exit and diver preparation • New beach manhole construction • Site restoration
Equipment required	• Drill rig • Crane (for placement of pipes) • Monitoring trailer • Tool/equipment trailer/storage • Bentonite mixing/recycling unit (note: may require wetting or screening to avoid airborne dispersion of bentonite) • Area and/or bins for drill cuttings/overburden • Fuel tanks (diesel) and containment
Personnel	8 (approximately)
Duration	6 weeks (for 3 bores) subject to no significant delays due to complications during drilling operations. 12 hours per day of operation. Operations typically run 7 days per week to maintain continuity and progress of the boring. Landing and installation of the cables are in addition to the 6-week period needed to install the bores.

This assessment considers the relative impacts on the beach and in the nearshore area, compared with the proposed project:

Beach disturbance and upland footprint – The beach disturbance for the preferred installation option is approximately 75 m (246 ft) in length from the end of the existing duct to the MLW

mark. It would take approximately 1 to 2 days to complete the burial on the beach, and 6 to 10 days in total from equipment staging to beach restoration. These beach operations would not be required for the HDD option.

However, as described in Section 2, the area of beach affected by the preferred option has been extensively disturbed by previous cable installations and by natural coastal processes of erosion and deposition. By contrast, the potential footprints for HDD at a nearby upland location would be in areas that are potentially undisturbed, and/or in areas along the road used for parking. As shown in Figure 3-1, a likely HDD staging and operations area would be adjacent to a seasonal watercourse and a trail used for recreation.

The expected duration of HDD installation at this site is approximately 6 weeks, including equipment staging and site restoration; the six-week period does not include the actual landing and installation of the cables once the bores are completed, which would be expected to be scheduled shortly after bore completion. This compares with 6 to 10 days for the completion of the preferred installation option. Both estimates assume that two AAG (or other) cables or bores would be installed concurrently. The duration for the HDD option would be affected by subsurface conditions, which influence the ability to advance the drill if rock or variable conditions are encountered. The time estimate of 6 weeks assumes that no significant technical problems are encountered during the drilling operations, though experience suggests that such problems are common. These complications can very significantly extend the duration of drilling operations.

Importantly, the EA for the Sandwich Isles Communications Inc cable system noted in the discussion of alternatives that soil testing at the Keawa‘ula site revealed the presence of subsurface boulders, which would not be conducive to application of the HDD technique.[6]

Compared with the proposed project, the HDD approach would also require more equipment and materials to be staged and used in the project area, including diesel for fuel and bentonite for use as drilling mud or lubricant, as shown in Figure 3-2. Because the location is not near residential or similar receptors, the noise, dust, and equipment exhaust from the HDD operations would probably be minor, but could cause short-term nuisance or airborne irritants to recreational users. In addition, although spillage capture techniques are used during HDD

[6] Final EA/FONSI, Sandwich Isles Communications Inc. Fiber-Optic Cable Project, 2004. The EA also indicated sand deposits at Keawa‘ula presented favorable conditions for HDD.

operations (spill tanks, straw bales etc), there remains potential for bentonite, topsoil or other sediment to escape into the fresh and seawater environments should heavy rain conditions affect the site, causing these mitigation measures to fail and excess wash-out to escape directly to the ocean.

Unlike the selected option, the HDD alternative might require the construction of an additional beach manhole (BMH) after completion of the bore, and/or associated ducts to receive the cable from the directional bore and to connect into the existing land route to the cable station.

Nearshore impacts – The HDD alternative would avoid direct contact between the cables and seafloor to the bore exit location approximately 800 to 900 m (0.5 to 0.6 mi) offshore. However, HDD has the potential for indirect effects on corals if a frac-out were to occur.[7] At the bore exit, which according to dive survey observations consists of hard substrate,[8] the seabed would be disturbed or potentially damaged as the bore breaks through the seafloor. The preferred option would lay the cable directly on the seafloor, which consists of a range of features that will be selectively avoided or targeted by divers during installation. Beyond the 25 m (82 ft) water depth contour, the effects of the preferred project and HDD alternative would be the same.

Table 3-2 highlights the comparison between the HDD alternative and preferred project. The most prominent contributing factor in the assessment is the existing condition of the landing, which includes infrastructure on the beach and nine cables. The short-term effects of HDD installation would exceed those of the preferred project in both duration and intensity, and potentially create additional complexity not encountered during previous installations at the project site. Neither the beach nor the nearshore project areas show signs of long-term disruption or damage to coral and marine growth from the prior installations using the direct landing technique proposed.[9] In fact, the diver swim operations have shown that existing cable systems have provided suitable conditions for promoting coral growth on the cable surfaces.

Therefore the HDD alternative was not selected on the basis of the relative impacts compared with the preferred project.

---

[7] The California Coastal Commission cites potential adverse effects of bentonite from frac-outs, and notes that 3 of the 4 permitted fiber optic cable projects experienced frac-outs during HDD operations. See California Coastal Commission Staff Report E-05-007 MBARI 2005.
[8] Dive survey conducted by AMEC in May 2007, Appendix A of this Draft EA.
[9] During a prior installation a channel was cut through two sections of the reef to enable placement of cable; this is not proposed for the installation of the Australia-Hawaii cable.

Table 3-2. Comparison of Proposed Project and HDD Effects

Issue or Feature	Proposed Project	HDD Alternative
Duration of construction work	6 to 10 days	6 weeks (if no delays due to drilling complications) for bore installation and 2 to 3 days to land the cables. The timing of the cable landing relative to the completion of the bores would depend on a number of factors.
Construction Footprint – beach and upland	Beach – 75 x 15 m = 1,125 m2 (0.3 acre), for beach excavations. Upland – 5 x 10 m = 50 m^2 (0.01 acre) for beach manhole access. Total area of footprint – 1175 m^2 (0.31 acre)	Beach - None Upland – minimum 25 x 70 m = 1,750 m^2 (0.4 acre) for drilling and associated operations.
Operational footprint	Beach – None Upland – BMH (existing)	Beach – None Upland – New BMH (possible) and associated ducts.
Seabed disturbance (shallow water zone)	Negligible. Jet burial from LWM to 3 m (10 ft) water depth, if needed. No other burial proposed.	No disturbance inshore of bore exit point at 25 m (82 ft) water depth. Disturbance at the 3 bore exit points, and potential damage to hard substrate. Risk of frac-out (release) of bentonite drilling fluid from bore.
Benthic ecology	Potential for localized impacts on coral along some areas of the alignment during cable landing (avoided or minimized by proposed mitigation measures). Cables and articulated pipe may later become habitat for coral (as documented during the dive survey).	Risk of frac-out (release) of bentonite drilling mud from bore, potentially settling on corals and other benthic organisms and adversely affecting filtration. Potential for localized impacts on coral and live rock at bore exits where the bore would break through the surface (mitigation measures would be required).
Mammals and turtles	Potential for short-term disturbance to marine mammals and sea turtles by the presence of vessels and placement of cables during installation of the cable.	Potential for short-term disturbance to marine mammals and sea turtles by the presence of vessels and placement of cables during installation of the cable. Disturbance avoided in water depths <25 m (82 ft). Bore punch-out would create localized disturbance. Disturbance from main lay same as proposed project.

Table 3-2. Comparison of Proposed Project and HDD Effects (Continued)

Issue or Feature	Proposed Project	HDD Alternative
Vegetation (terrestrial)	Beach – minor encroachment on vegetation (mainly invasive grass) above beach for excavation at ends of existing ducts. May revegetate naturally or minor restoration required. Upland – cutting, but not removal, of 50 m^2 (538 ft^2) of vegetation to allow access to BMH.	Beach – None Upland – Dependent on final siting. Clearance of vegetation may be required across construction site to allow siting of drilling rig and related equipment. Restoration plan required.
Air quality	Short-term (6 to 10 days) emissions from the excavator and small diesel-powered winch.	Potential release of inert bentonite dust during mixing operation. May require mitigation, such as dust suppression or screening to reduce airborne bentonite. Emissions from drilling rig and mixing plant during drilling operations (6 weeks) would be dependent on the specifications of the equipment used.
Oil, hazardous materials, and waste	No fuel storage required. No hazardous materials. Solid waste limited to refuse that would be managed appropriately.	Fuel storage required on site, as shown in Figure 3-2. No hazardous materials anticipated aside from equipment fluids such as lubricants. Wastes such as drill cuttings and spent drilling muds disposed of at a landfill or recycling facility.
Noise	No major sensitive receptors. Localized and temporary noise from excavation and winching operations, and minor vehicle movements.	No major sensitive receptors. Operation of on-site plant and machinery during operations (drilling rig, crane, mixing plant etc.). Localized and temporary noise from site preparation activities and vehicle movements.
Water quality	Negligible. Activity in the surf zone would represent little change from natural coastal processes at this high-energy location. Resuspended sediments would settle quickly. No new materials would be introduced to water	Potential sediment run-off from upland construction site to adjacent watercourse and sea will require hay bales or other site drainage control and mitigation measures.

Table 3-2. Comparison of Proposed Project and HDD Effects (Continued)

Issue or Feature	Proposed Project	HDD Alternative
Personnel	15 to 20, onshore and offshore during construction and cable landing operations.	Approximately 8 during drilling operations, excluding offshore personnel for water quality monitoring (if required). 5 to 10 onshore and offshore during subsequent cable landing operation through completed HDD bores.
Road traffic and parking	No closure of Farrington Highway. required. Traffic control as required for movement of heavy equipment. Parking for 10-15 shore-based staff during 6 to 10 day operation.	Short-term closure of Farrington Highway may be required for equipment staging and removal (depending on site location). Parking for 8 staff during minimum 6-week drilling operation, and for 5 staff during subsequent cable landing operations. Equipment and materials delivery to site, including drilling rig, mixing plant crane, etc.
Visual impact (construction operations)	Excavator and winch present on and adjacent to beach for 6 to 10 days.	HDD site close to highway for minimum of 6 weeks, including drilling rig, pipe and equipment storage, fuel storage, bentonite mixing/recycling unit, cutting containers, crane, trailers etc.
Cultural resources	The project area is highly disturbed from natural processes and prior installations. Cultural resources survey indicated no resources found. Marine survey indicated no shipwrecks impacted.	Bore should be beneath any cultural resources on beach. Upland area would require additional surveys to assess presence of resources. Marine survey indicated no shipwrecks impacted.
Recreational uses	No closure. Restricted public access to work areas in small section of beach (6 to 10 days). Minor and localized restrictions on sea uses (surfing, boating, fishing, etc.) during shore-end landings from cable ship (1 to 3 days).	Localized and indirect effects to users from noise and disturbance from drilling site. Minor restrictions on sea uses during 3 bore punch-outs and subsequently during shore-end landings of cables through the HDD bore pipes

3.4 No Action Alternative

The No Action alternative would avoid the potential impacts of the project and alternatives. There would still be nine cables installed beneath the beach and on the seafloor just offshore of

the BMH at the current landing site. However, if the No Action alternative were selected, the project objectives of increasing access to trans-Pacific telecommunications networks, and improving the diversity and security of existing networks would not be achieved.

CHAPTER 4: AFFECTED ENVIRONMENT

4.1 Topography and Geological Conditions

This section describes the geologic and seismic setting at the site, which includes regional and site specific geologic descriptions, area soils, and regional and local faulting. In addition, geologic hazards that may affect the site and/or project design are also addressed.

4.1.1 Existing Conditions

As described in the Sandwich Isles Communications EA (2001):

The island of O‘ahu *was created by the extrusion of basaltic lavas from two shield volcanoes,* Wai‘anae *and* Ko‘olau*. The older volcano,* Wai‘anae*, is estimated to be middle to late Pliocene in age and forms the bulk of the western one-third of the island. The younger shield,* Ko‘olau*, is estimated to be late Pliocene to early Pleistocene in age and forms the majority of the eastern two-thirds of the island.* Wai‘anae *became extinct while* Ko‘olau *was still active, and its eastern flank was partially buried below* Ko‘olau *lavas banking against its eastern flank forming a broad plateau, now known as the Schofield Plateau.*

4.1.1.1 On-Shore Setting

The proposed cable landing site is located on the northwest (leeward) side of the island of O‘ahu at the north end of the Farrington Highway at Keawa‘ula Beach. The project site is underlain by unconsolidated non-calcareous deposits and unconsolidated marine calcareous sediments. The non-calcareous deposits are mainly composed of younger alluvial deposits. This deposit also includes colluvial deposits consisting of angular talus material deposited near the base of the mountainsides. The calcareous sediments consist of beach sand (Natural Resources Conservation Service [NRCS] 1990).

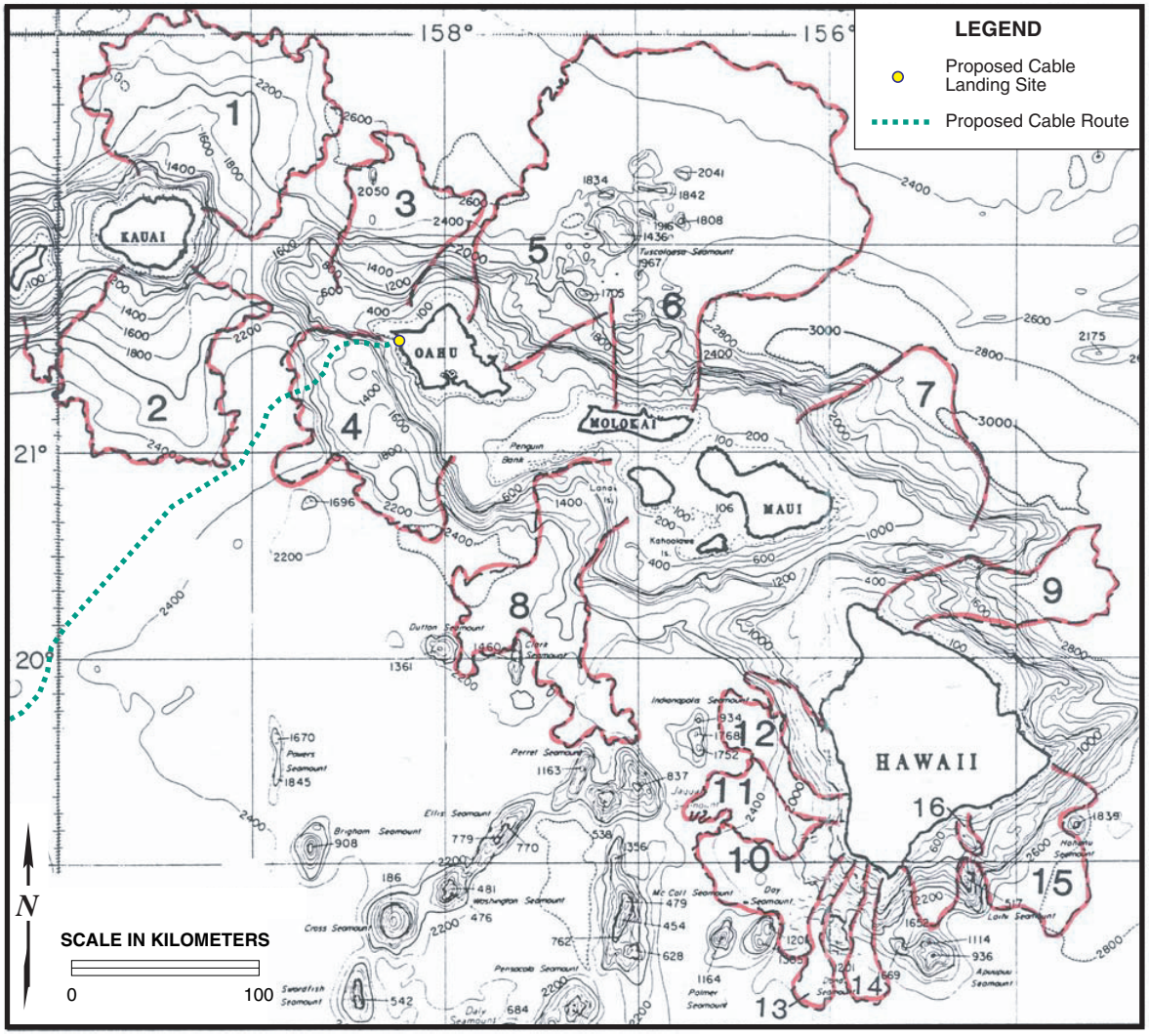
4.1.1.2 Offshore Setting

In the approach to the Island of O‘ahu, the cable route crosses the Hawai‘ian Arch, which corresponds with a broad area of low relief where the ocean floor bows up. Over the arch, fresh lava may be present and landslide deposits are expected at the seabed.

The Hawai‘ian Islands are surrounded by ancient catastrophic landslides, which probably resulted from the relative instability of the fast-growing hot spot volcanoes. The cable crosses the Wai‘anae Slump offshore of O‘ahu before climbing the island slope towards the east (Figure 4-1). In this slump area the seabed exhibits a relatively disturbed topography with individual blocks generally less than a few km in size. Maximum sediment thickness on these blocks averages 9 m and sediments consist of pelagic mud mixed with turbidities from the nearby islands.

In the final approach to the landing site on O‘ahu, the seafloor likely consists of volcanic sediments, volcanic rocks, coral debris, and some pelagic mud with exposures of lava. Only the areas close to the beach are expected to have appreciable amounts of sediment (sand) (Fugro 2006).

The unique marine geology at the project site is characterized by a shallow dipping marine terrace to 18 to 20 meters (m) (59 to 66 feet [ft]) water depth, consisting of relatively ancient (ca. 200,000 years) and hard lithified limestone (Sherman, et al 1999). The shallow section of this terrace extends from the shoreline to ~8 m (26 ft) water depth and continues seaward onto a seasonally sandy shelf extending to 18 m (59 ft) water depth where a second small terrace edge is exposed. To the seaward margin of this terrace, a second zone of exposed area of hard bottom limestone slopes more steeply to the 25 m (82 ft) contour. This substratum continues until another distinct slope break is encountered at ~35 m (115 ft) water depth. The area is punctuated by shallow (< 1 m [3 ft]) depressions and hard bottom fingers of fossilized reef throughout the nearshore area. These dipping benches are subject to seasonal sand deposition during calmer spring/summer conditions, and significant scouring and offshore transport by large swells during the fall and winter. This series of stepped marine terraces occurs as a near continuous patchy feature along the coastline due to variable sand deposition. These submarine terraces are typically covered in sand in the nearshore areas where located adjacent to sandy beaches that form in the bays opposite predominant canyon heads (AMEC 2007, see Appendix A of this document).



Feature ID	Name	Area (km^2)	Type
1	North Kauai	14,000	Debris avalanche
2	South Kauai	6,800	Debris avalanche
3	Kaena	3,900	Debris avalanche
4	Waianae	6,100	Slump
5	Nuuanu	23,000	Debris avalanche
6	Wailau	13,000	Debris avalanche
7	Hana	4,900	Slump
8	Clark	6,100	Debris avalanche
9	Pololu	3,500	Debris avalanche
10	South Kona	4,600	Slump
11	Alika-1	2,300	Debris avalanche
12	Alika-2	1,700	Debris avalanche
13	Ka Lae, west	850	Debris avalanche
14	Ka Lae, east	950	Debris avalanche
15	Hilina	5,200	Slump
16	Papa'u	200	Sand & rubble flow
17	Loihi	500	3 unclassified landslides

EA

Offshore Geologic Environment

FIGURE 4-1

4.1.2 Geologic Hazards

4.1.2.1 Earthquakes

In the central Pacific, high seismic hazard areas are mostly confined to the Island of Hawaiʻi. Seismic hazard near the Oʻahu cable landing site is rated moderate to high by the U.S. Geologic Survey National Earthquake Center (Figure 4-2) (Fugro 2006).

4.1.2.2 Volcanoes

In Hawaiʻi, active volcanism is confined to Mauna Loa and Kilauea volcanoes located on the Island of Hawaiʻi, and Loihi Seamount located off the southeast coast of Hawaiʻi. Hawaiʻian-type eruptions are rarely life threatening because the lava advances slowly enough to allow safe evacuation, but large lava flows can cause considerable economic loss by destroying property and agricultural lands (Fugro 2006). No active volcanoes are located on the Island of Oʻahu.

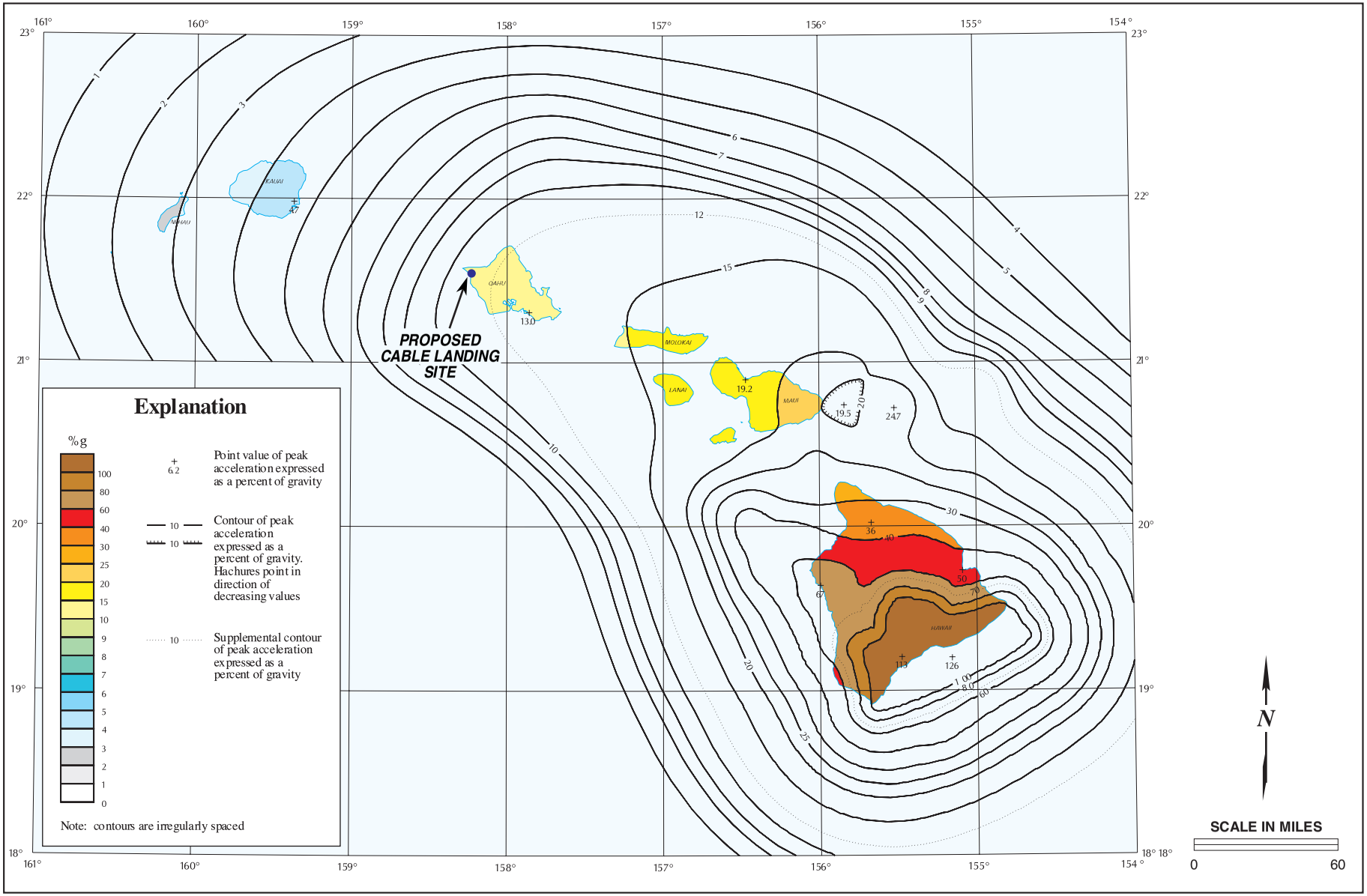
4.1.2.3 Tsunamis

Tsunamis are seismic sea waves caused by earthquakes, submarine landslides, and, infrequently, by eruptions of island volcanoes. During a major earthquake, the seafloor can move by several meters and an enormous amount of water is set into motion. The result is a series of waves that move across the ocean at speeds greater than 800 km per hour.

In the Hawaiʻian Islands, both a prehistoric and historic record of locally-generated tsunamis exist. Historic local tsunamis were produced in 1886 and 1975 by large earthquakes that occurred under the island of Hawaiʻi. The earthquakes that produced these tsunamis had magnitudes of 7.2 or greater and were the result of tectonic movement of the island (Fugro 2006). The proposed cable landing site is located in a tsunami evacuation zone, as designated by the Pacific Disaster Center (Pacific Disaster Center 2007).

4.1.3 Short-Term Impacts

Ground-disturbing activities (i.e., during site preparation and installation) will be restricted to the equipment staging areas and beach, as shown in Chapter 2. Installation activity would not change the existing topography or geology of the immediate area of the proposed Australia-Hawaii Cable System landing site. Equipment will be staged either on the road shoulder or on



EA

Earthquake Hazard Designations in the Vicinity of the Proposed Project

FIGURE 4-2

the beach, and would not cause erosion or runoff to creeks or drainages. There will be no ground disturbance in the upland areas near the drainages.

After excavation and burial along the beach is complete, the beach will be restored to its pre-installation condition, and the resulting topography and beach profile will be unchanged. No rocks or reef sections will be cut or altered, so these geologic resources will not be adversely affected.

The activity in the water will not remove native sediments or materials or introduce new materials as part of the installation. Jetting will temporarily displace and redistribute sediments in the shallow water zone (less than 3 m [10 ft] water depth), but they will settle naturally, and will not adversely affect geological resources. The level of disturbance by jetting will be insignificant compared with natural sediment movement in the nearshore area.

4.1.4 Long-Term Impacts

Installation of the cable affects a small area of the beach and nearshore, and will not change the topography or geologic character of the project area. Upland infrastructure (e.g., the duct between the existing beach manhole (BMH) and cable station) is already installed and no changes are required. The project will not result in erosion that could have long-term impacts.

4.1.5 Mitigation Measures/Best Management Practices

No mitigation is required. All project installation activities would occur on the beach or roadside where soils have been previously disturbed. Best Management Practices (BMPs) will include site restoration to maintain the existing topography and beach profile. Therefore, project implementation would not result in significant impacts to geology or geologic resources.

4.2 Land Use

4.2.1 Existing Conditions

This section provides a discussion on zoning/General Plan designations for the site and surrounding land uses.

The proposed cable landing site is located on the northwest (leeward) side of the island of O‘ahu within the Wai‘anae District at the north end of the Farrington Highway at Keawa‘ula

Beach. The Waiʻanae District coastline of Oʻahu is largely rural with most of the urban and suburban development clustered in the Farrington Highway corridor, along with expanses of beaches and beach parks. The proposed project site is under the jurisdiction of the City and County of Honolulu and located within the boundaries of Kaʻena Point State Park. Activities and development within the Waiʻanae District are guided by the Waiʻanae *Sustainable Communities Plan* (July 2000). The Plan area comprises 38,089 acres, almost 10 percent of Oʻahu's total area. The Plan addresses the core issues of preservation, growth, development, population, housing, infrastructure, and public facilities.

The proposed cable landing site is located in an area designated *Conservation* by the State Land Use Commission and zoned *P-1 "Restricted Preservation District"* by the City and County of Hawaiʻi Land Use Ordinance (Figure 4-3) (City and County of Honolulu 2000).

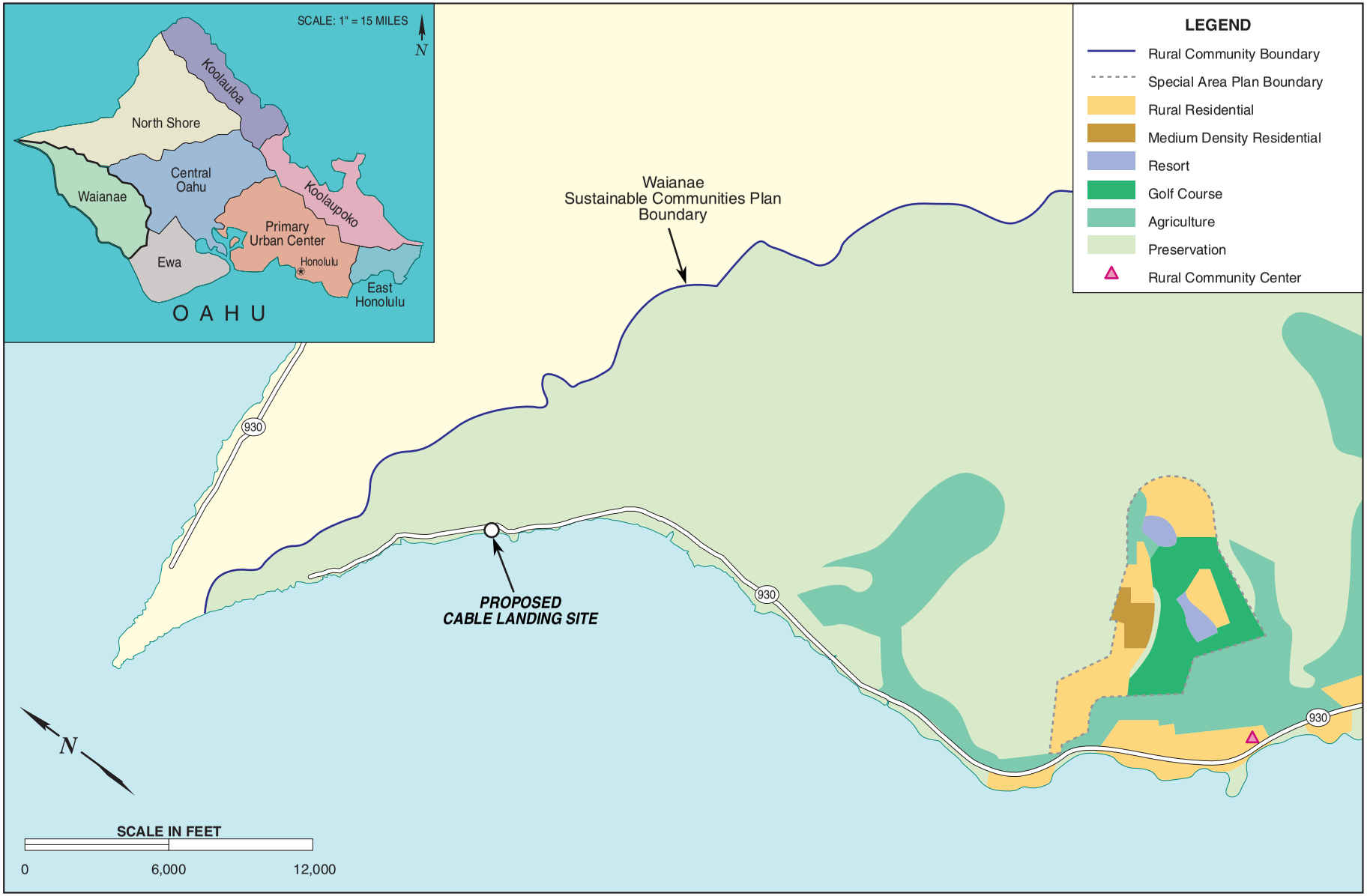
4.2.1.1 Subzone

Within the Conservation District, there are also five subzones: *Protective*, *Limited*, *Resource*, *General* and *Special*. Omitting the *Special* subzone, the four subzones are arranged in a hierarchy of environmental sensitivity, ranging from the most environmentally sensitive (*Protective*) to the least sensitive (*General*). These subzones define a set of "identified land uses" which may be allowed by discretionary permit.

Based on the subzone map of the State of Hawaiʻi Department of Lands and Natural Resources (DLNR), Office of Conservation and Coastal Lands, the proposed project is situated in a *Resource* subzone (DLNR Conservation District Subzone Maps). The objective of this subzone is "to develop, with proper management, areas to ensure sustained use of the natural resources of those areas." Permitted uses in this subzone also include all permitted uses stated in the *Protective* and *Limited* subzones: aquaculture, artificial reefs, and commercial fishing operations.

4.2.1.2 Coastal Zone

The proposed project is located within the designated Coastal Zone. The Hawaiʻi Coastal Zone Management Program (CMP) is designed to manage the State's coastal areas and resources. Coastal resources include beaches, fishponds, scenic areas, marinas, wetlands, recreational areas, anchialine ponds, fish, open spaces, whales, sea turtles, harbors, historic sites, and



EA

Land Use Designations in the Vicinity of the Proposed Project

FIGURE 4-3

ecosystems. Because the coastal areas and their resources have traditionally been and continue to be an integral part of the lifestyle of the people of Hawai‘i, their management is important. Therefore, the CMP is based on the premise that coastal resources' use and development must be environmentally sound, socially acceptable, and economically beneficial to the people of Hawai‘i. The landing site at Keawa‘ula Beach is used for recreational purposes such as surfing, swimming, fishing, boating and picnicking. Balance and effective management are primary purposes of the CMP (State of Hawai‘i, Office of State Planning 1990).

Additionally, the landing site is located within the State of Hawai‘i Special Management Area (SMA). County governments play an important role in implementing the CMP by regulating development in geographically designated SMAs. Through their respective SMA permit systems, the counties assess and regulate development proposals in the SMA for compliance with the coastal zone management objectives and policies and SMA guidelines set forth in Chapter 205A, Hawai‘i Revised Statutes (HRS).

Ka`ena Point State Park

Ka‘ena Point State Park is the last beach along Farrington Road which ends at Ka‘ena Point. This West Coast beach has a unique vantage point of the coast and is the most northwestern point of O‘ahu. The area is relatively remote and is used for picnicking opportunities and shore fishing. The sandy beach at Keawa‘ula Bay is used for board surfing, bodysurfing, and swimming. The park is also used for hiking along the volcanic coast with tide pools, small natural stone arches and views of Makua coastline.

4.2.2 Short-Term Impacts

As described in Chapter 2, cable installation activities will be limited to a defined area of the park's beach area seaward (or *makai*) of Farrington Highway. The contractors will maintain controlled access to the work area for public safety, but the remainder of the beach will remain open throughout the installation. The complete installation, including the Australia-Hawaii and AAG cables, will conclude in 6 to 10 days. Excavation and burial of the cables on the beach will last from 1 to 2 days.

The effects on land uses in the project area will be limited and temporary. Recreational use of Ka‘ena Point State Park will not be precluded by the project activity. A portion of the beach will

be designated as a work area to maintain safe distances, as shown in Figure 2-7, but the remainder of the beach will be open for recreation. Swimming, diving and boating will be restricted near project activities in the water, also for public safety. Restricted access to portions of the beach and ocean will be temporary, and upon completion will be in pre-installation condition.

See also Chapters 4.3 (Archaeological Resources), 4.8 (Terrestrial and Marine Biology) and 4.11 (Public Facilities) for related discussions of effects on resources in the Coastal Zone, and measures to protect coastal resources during the project.

4.2.3 Long-Term Impacts

The project will not result in long-term impacts to existing and surrounding land uses. Once installed, the Australia-Hawaii cable will operate within existing underground telecommunications infrastructure and will not be discernable from site conditions as they currently exist. Existing beach and beach access and nearshore ocean recreational activities would not be affected by the proposed project.

4.2.4 Mitigation Measures/Best Management Practices

BMPs addressing protection of public beach use and access are:

- Local authorities, such as State Parks and local lifeguards, will be given advance notice of the work schedule.
- The contractor will maintain controlled access to the work area to maintain public safety while the beach remains open for public use. Access will be controlled through a number of measures, which may include temporary fencing, signage, and security staff.
- Security may be provided overnight for the equipment on the beach to ensure it is not vandalized and can remain in proper working condition for the duration of the installation. Security needs will be assessed in consultation with local authorities prior to mobilizing equipment.

Mitigations addressing the protection of coastal resources are noted in the discussions of archaeological resources and biological resources.

4.3 Archaeological and Historic Resources

4.3.1 Existing Conditions

Current models of Hawaiʻian history have permanent settlement on the island of Oʻahu on the windward side of the island beginning sometime between A.D. 0 and A.D. 900. During those years, residents often visited the leeward sides of the island to exploit various resources such as fishing areas, bird colonies, and shellfish bays. Small campsites associated with those visits are thought to exist throughout the leeward area. In the Waiʻanae District, such a site appears to have been present in Waiʻanae Valley along Pokaʼi Bay in the Waiʻanae Army Recreation Center.

Archaeological sites are found throughout the valleys in the Waiʻanae District. Many coastal dunes contain sites (including burials) which are hidden under the ground surface. Reportedly, the only fairly complete large archaeological surveys that have been conducted were located in upper Nankuli, in upper Lualualei, in mid to upper Makaha, and on the coastal flats of Keaau (City and County of Honolulu 2000).

The proposed project site is located within the boundaries of Kaʻena Point State Park, which is an area of cultural importance.

As noted previously, there are nine existing cables installed at the site. The beach area is disturbed from the earlier installations, as well as development associated with road construction and beach use.

An archaeological assessment of the project area was conducted in June 2007 to determine whether there were resources present. The assessment included:

1. Subsurface excavation along the proposed beach cable corridor,
2. Surface survey of a 10 x 10 m area (1,076 ft^2) surrounding the BMH, and
3. Surface survey of a possible equipment staging area alongside the road.

Archaeological fieldwork was conducted by Garcia and Associates (GANDA) on June 18 and 19, 2007.[1] The letter report prepared by GANDA is included in Appendix B. The report notes:

[1] Work on June 18 was performed under a special use permit obtained from the DLNR Division of State Parks. This permit covered all work in the area extending from the park access road to the beachline as well as the conduit manhole and equipment

- The main study area runs from the waterline at Keawa‘ula Beach, also known as Yokohama Beach, to an existing buried conduit at the state park access road. Terrain consists of wave-deposited beach sand grading upslope to an artificial, level grassy shelf. The original landscape likely consisted entirely of aeolian (i.e., wind-blown) beach dunes.
- Research conducted at the State Historic Preservation Division and at DLNR State Parks indicated that no previous archaeological investigation had been conducted in the cable corridor. There are, however, two documented archaeological sites in the vicinity of the project area. State Site 50-80-03-2805, a complex of 37 historic and prehistoric surface features, encompasses most of the coastal plain northeast of Ka‘ena Point access road (see GANDA report for references). Twenty-nine of the features are associated with early 1900s railroad, ranching, and general waste dumping. Eight features appear to be traditional Hawai‘ian including one possible *heiau*. These features are located well to the northeast of the project area.
- State Site 50-80-03-2802 is a traditional Hawai‘ian cultural deposit located 40 m (131 ft) southwest of the U.S. Air Force guard station and 4 m (13 ft) southwest of the Ka‘ena Point State Park entrance. This site was excavated by State Parks archaeologists in 1979 (Estiko-Griffin and Lovelace 1980). They recorded 28 subsurface features in the coastal sand deposits and recovered a variety of artifacts including volcanic glass flakes, basalt adze fragments, coral and urchin spine abraders, fishhooks, and an ‘*ulu maika*, among others. Prehistoric utilization of the site was apparently focused on exploitation of coastal and marine resources. Overlying historic-era deposition included crushed coral fill, probably related to the former O‘ahu Railway and Land Company railroad line, and two garbage pits. Site 50-80-03-2802 terminates at a wave-cut bank and extends some 20 m (66 ft) along the coast.
- For the Australia-Hawaii project assessment, excavation of six shovel test units in unconsolidated calcareous sand yielded no evidence of cultural deposition. Four units dug in the grassy area above the beach yielded primarily fill sediments containing modern trash. Due to the compact rocky fill layer in this area, the target excavation depth (1 m [3 ft]) was not met for all test units.

---

staging areas. A separate Right-of-Entry was obtained from the DLNR Land Division for the portion of the cable corridor running through unencumbered state lands (from the beachline to the waterline). This area was investigated on June 19, 2007.

GANDA concluded that because this corridor has been previously excavated for cable installation, it is expected that underlying sand deposits have an extremely low probability for containing intact cultural resources. GANDA's recommendations have been incorporated as mitigations (see discussion below) (GANDA 2007).

4.3.2 Short-Term Impacts

As noted above, an archaeological assessment, including test pits in the proposed beach excavation area, indicated that no cultural resources are likely to exist at the proposed project site. Because the site has been previously disturbed by excavation activities and is subject natural coastal erosion (e.g., scour and concussive force) and deposition processes in the beach area, intact cultural resources are unlikely to occur. Based on the findings obtained during the field investigation, and the history of the project area, no impacts to archaeological resources are expected during installation.

4.3.3 Long-Term Impacts

No long-term impacts to archaeological or historic resources are anticipated.

4.3.4 Mitigation Measures/Best Management Practices

As a precaution, for the protection of archaeological, cultural, and historic resources, the following mitigation measures are proposed:

- A qualified archaeological monitor be present during excavation activities in the cable corridor; and
- If potentially significant resources are uncovered during excavation or trenching activities, all excavation or trenching activity shall halt until the nature and significance of the resources can be determined by the on-site archaeologist.

4.4 Cultural, Social and Economic Activities

4.4.1 Existing Conditions

According to the 2000 U.S. Census, the resident population in the vicinity of the proposed cable landing site (Census Tract 98.01) numbers 2,386. In comparison, the population of the

Wai‘anae area numbers 10,506 and the population of Honolulu County was 1,197,309 in 2000 (U.S. Census Bureau 2000).

No residences or commercial properties are located at the proposed project site. The nearest residential and commercial properties, apart from the AT&T cable station, are located in Makaha, approximately 8 km (5 mi) south of the project site. The use of the project area for recreation is discussed in Chapters 4.2, Land Use, as well as the importance of coastal resources. The beach and coastal resources have cultural, social and economic value to the local community.

4.4.2 Short-Term Impacts

As discussed in Chapter 4.2, the beach will remain open during project activity, with controlled access to the work area, and will not preclude regular socioeconomic activity in the project area, which is primarily used for recreation. Measures taken to protect coastal resources are addressed in Chapter 4.8.

The discussion in Chapter 4.3 noted an archaeological assessment was conducted at the site in June 2007, and that shovel test units yielded no evidence of cultural deposition. On the basis of these tests, background review of available surveys, and known conditions at the site, no impacts to cultural resources are expected.

No impacts to existing resident and worker populations in the Wai‘anae District are expected. The proposed project will provide limited opportunities for purchases of materials and services, and potential for short-term employment, associated with the construction activities. There will be no impact on State and County operational expenditures for public services on the island.

The beach area is known to be vulnerable to thefts from vehicles. Overnight security staff will be provided during the construction period to monitor equipment left on site, as discussed in Chapter 4.2.

4.4.3 Long-Term Impacts

The project will not have long-term adverse impacts in the project area related to the presence of the cable at the beach. The installation and operation of the Australia-Hawaii cable would

provide economic and commercial benefits at the state level by increasing telecommunication access and expanding Hawai`i's current position as a telecommunications hub.

Because the operation of the Australia-Hawaii cable system would be conducted at the existing AT&T cable station, no new employment will be necessary, and the project will not induce commercial growth or the need for housing at the project site or immediate project area. The project will not permanently disrupt or change the unique character of the Waiʻanae District.

4.4.4 Mitigation Measures/Best Management Practices

BMPs and mitigations addressing the use of the beach and protection of coastal resources are discussed in Chapter 4.2. Combined with the mitigations proposed in Chapter 4.3, these mitigation measures are protective of cultural, social and economic activities in the project area. No further mitigation is required.

4.5 Visual and Aesthetic Resources

4.5.1 Existing Conditions

Kepuhi Point marks the northern coastal limits of Makaha Valley. Lands north of Kepuhi Point are largely undeveloped lands. Land uses include beach parks, ranch lands, the Army's training area at Makua Valley, and extensive areas of State-owned forest lands. The undeveloped, rugged character of this part of the Waiʻanae coast is largely unchanged from its historical character, particularly in comparison with more developed areas.

Although no "significant stationary views" were identified from Keawaʻula Beach in a study commissioned by the City Department of Land Utilization in 1987, unobstructed views of the Pacific ocean and Waiʻanae Mountain Range are important to the local community as they provide a sense of what this area once looked like (City and County of Honolulu 2000).

The project description (Chapter 2) provides maps and aerial photographs of the project site and general area.

4.5.2 Short-Term Impacts

Installation of the Australia-Hawaii and AAG cables combined would last approximately 6 to 10 days, including equipment staging and site restoration on or at the beach. Excavation would

take 1 to 2 days. These activities would require controlled access to the work area but would otherwise not restrict beach use. Project vessels would be present during part or all of this period, but the cable ship would be present for a more limited time.

Project activities will be temporary and will not adversely affect a designated scenic vista. The equipment and vessels would be visible to the public from the state park and from Farrington Highway, but the duration will be less than 10 days. Therefore, impacts are not considered significant.

4.5.3 Long-Term Impacts

After installation, the project will have no visual impact, and will not affect existing view sheds or scenic resources.

4.5.4 Mitigation Measures/Best Management Practices

No mitigation measures are necessary.

4.6 Water Resources

4.6.1 Existing Conditions

Water resources considered in this analysis include surface water and drainage, flood hazards, groundwater, and water quality. Surface water resources include the Pacific Ocean, lakes, rivers, and streams, and are important for a variety of economic, ecological, recreational, and human health reasons. Groundwater resources comprise the subsurface hydrologic resources of the physical environment, and are essential resources in many areas; groundwater is commonly used for potable water consumption, agricultural irrigation, and industrial applications.

4.6.1.1 Surface Water

At the project site, the annual mean high water level is 54 cm (21 in) and the annual mean low water level is 24 cm (9 in). The average tidal range is 36 cm (14 in).

Waters offshore the project site are in the Class AA category as defined by the Department of Health (DOH). According to DOH administrative rules, marine waters are categorized as Class AA and Class A. Class AA waters are to “remain in their natural pristine state as nearly as

possible." Class A waters can be used for "recreational use and aesthetic enjoyment," among other allowable uses compatible with protecting the natural resources in these waters (Hawai'i Administrative Rules Chapter 11-54, Water Quality Standards).

A freshwater drainage is located approximately 25 m (82 ft) south of the landing site. No other surface water exists in the immediate project area.

4.6.1.2 Flood Hazards

The Flood Insurance Rate Map (FIRM) describes the Wai'anae coastline area as a Special Flood Hazard Area inundated by the 100-year flood. The designation for this shoreline area is generally Zone D indicating areas where flood hazards are undetermined but possible (Federal Emergency Management Agency [FEMA] 2005).

4.6.1.3 Groundwater

Groundwater situated in the uppermost aquifer, below the proposed project site, has been characterized as basal in nature, exists within sedimentary deposits, and is not a source for domestic use (Mink and Lau 1990).

4.6.2 Short-Term Impacts

The primary water quality concern during installation is the potential for increased turbidity from sediments disturbed in the nearshore area and runoff from the project activities in the beach area. During beach excavation and diver jetting, sediments will be temporarily displaced and redistributed, which will cause some temporary turbidity. As described in Chapter 2, the cable will be jetted into the sediments to an approximate water depth of 3 m (10 ft). Neither the beach excavation nor the jetting will introduce new or non-native materials to the water. The beach will be restored after the cables are in place, and after diver jetting the sediments will settle naturally.

The sediments at the project site are well-sorted and, given the absence of pollutant sources at the site, of high quality. The temporary displacement of sediments during installation will not introduce or resuspend contaminants into the water column. (See also Chapter 4.8 regarding findings of the June 2007 dive survey.) The beach and nearshore sediments in this area are mobile and subject to regular natural processes of erosion and deposition.

A secondary consideration is the potential for equipment or vessels to release petroleum hydrocarbons or other hazardous materials into the environment. The implementation of standard BMPs and spill prevention measures reduces the potential for such releases. BMPs are noted below.

The short-term effects of project installation on water quality will be temporary and non-adverse, and the potential for releases will be reduced by implementation of BMPs.

4.6.3 Long-Term Impacts

Project activities potentially affecting water quality are limited to the installation phase. The cables do not contain materials that would be harmful to water quality and would have no effect on water quality.

4.6.4 Mitigation Measures/Best Management Practices

BMPs will be implemented to avoid introduction of refuse or other non-native materials onto the project site to remove the potential for material to enter the ocean or drainage to the south of the beach work area. Equipment and vessels shall be operated under regulatory requirements and accepted safe practices to prevent accidents that could result in releases. BMPs are noted in Chapter 2, and those applicable to the protection of water quality include:

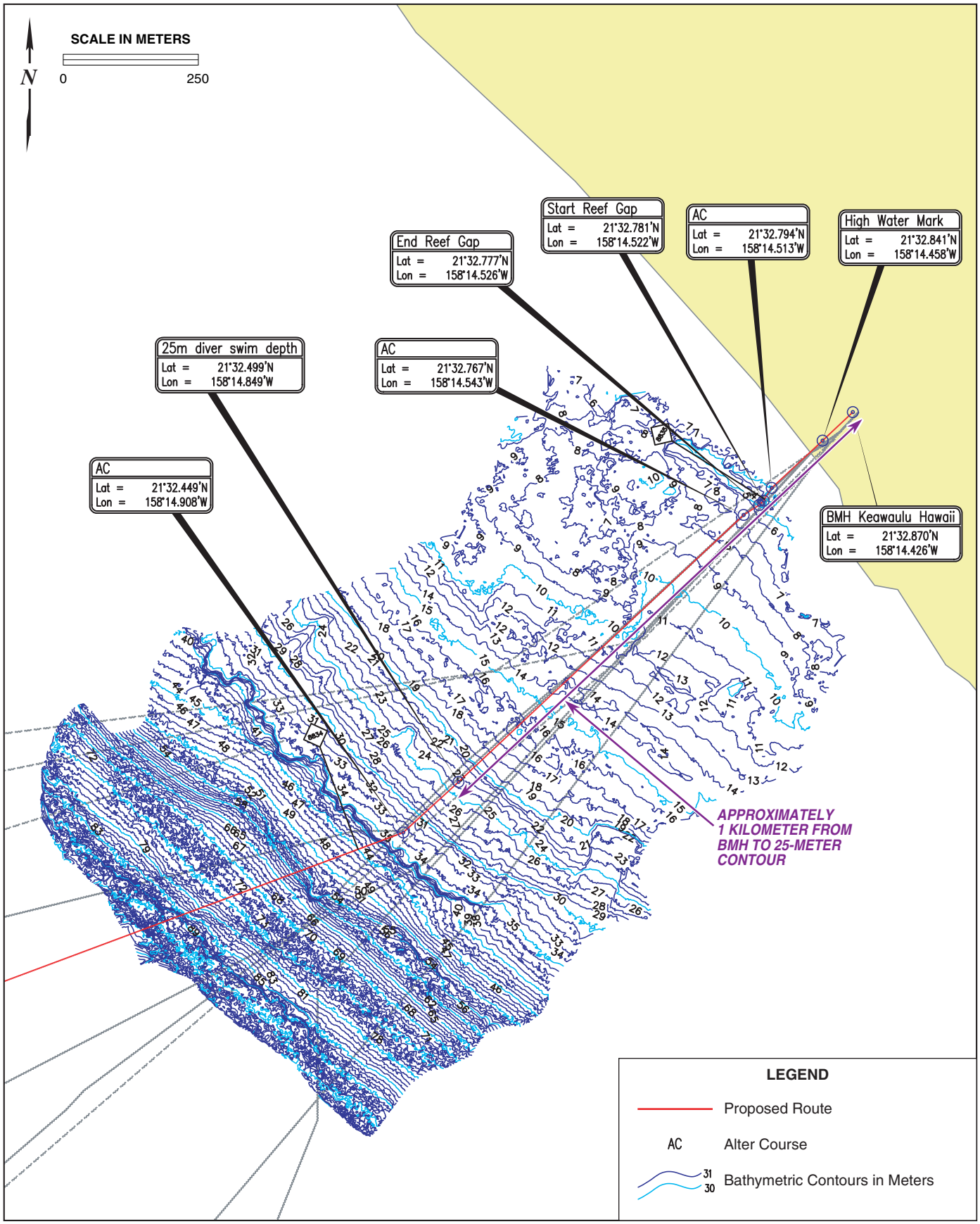
- Management of refuse and general site management to prevent materials from entering drainages or the ocean.
- Spill prevention and response plans for vessels and site management of equipment fluids.
- Safety plans specific to the work area to prevent accidents.

4.7 Marine and Nearshore Conditions

4.7.1 Existing Conditions

4.7.1.1 Bathymetry

Chapter 4.1, Geological Conditions, describes the submarine terraces along the approach to the site. Figure 4-4 provides a chart of the bathymetry in the project area. The site-specific bathymetry was obtained during the cable route inshore survey in May 2007.



EA

Nearshore Bathymetry of the Project Area

FIGURE 4-4

4.7.1.2 Marine Hazards

High Waves

In Hawai'i, waves are caused by: 1) the north Pacific swell; 2) the northeast trade wind swell; 3) a south swell; and 4) kona storm swells. The north Pacific swell is generated by storms in the Aleutian Islands area, and it tends to produce wave heights 2 to 9 m (8 to 30 ft) on average between the months of October and May. The north Pacific swell tends to be the most destructive of the four sources. The northeast tradewinds produce wave heights 1.2 to 3.7 m (4 to 12 ft) on average between the months of April to November. The south Pacific swell is most active between April and October and produces wave heights that range 0.3 to 1.2 m (1 to 4 ft). Kona storm waves average 3 to 4.6 m (10 to 15 ft) and can occur at any time of the year (Sandwich Isles Communications 2004).

Storm conditions and regular seasonal variations cause sand movement along the shore. Sand cover on the beach varies seasonally, and scour over the reef was notable during the dive survey conducted in May 2007 (see Chapter 4.8 and Appendix A). These natural processes affect nearshore sand depth and biota adapted to high-energy conditions.

Storms and Hurricanes

The Hawai'ian Islands have some of the most temperate weather conditions in the world due to their geography and the presence of a large stable subtropical high-pressure system that produces persistent cool northeast trade winds across the islands. This accounts for the wetter climate on the windward sides of the islands compared with leeward areas.

Storms originating from the north Pacific usually occur between the months of October and April, and can cause severe wind and rain conditions, particularly on the north side of the islands. However, *kona* (or leeward) storms, which normally form in the west and northwest Pacific Ocean, usually cause the more severe wind and rain conditions on the south side of the islands. Hurricanes are relatively rare to the islands. The last two hurricanes, Iwa in 1982 and Iniki in 1992, caused significant damage mostly to Kaua'i (Sandwich Isles Communications 2004).

4.7.2 Short-Term Impacts

Project installation will not require cuts or modifications to the reef or other bottom features that would affect bathymetry or natural processes, such as sediment transport. The cable route is designed to stay within the area of existing cables and to avoid disturbance to the reef. As shown in Chapter 2, there are existing gaps or cuts in the reef that have been incorporated into the proposed alignment to avoid new contact, and to place the cable securely. Project installation will not adversely affect the natural contours of the project area or coastal processes.

4.7.3 Long-Term Impacts

The potential long-term effect resulting from the installation of cables subject to these marine hazards is the potential for the cables to be damaged and require repair. A repair would not impact coastal processes, but would entail temporary disturbance (similar to installation) to repair the cable.

The potential for damage is avoided or reduced by cable engineering and route design. The Australia-Hawaii cable system incorporates armoring and the additional protection of articulated pipe suitable for the expected conditions. These features are described in Chapter 2. The nine cables currently installed at the project site are the best demonstration of the effectiveness of these design considerations. As noted in Chapter 2, there have been no cable faults on any of the cables at the Keawa‘ula landing (Murray 2007).

On the basis of recorded conditions, cable fault history at the landing, and proposed cable protection design, the potential for cable damage from marine hazards is considered to be low.

4.7.4 Mitigation Measures/Best Management Practices

BMPs that address cable protection and design appropriate for the site-specific marine hazards are noted in Chapter 2 and include:

- Use of desktop study findings to select cable design and routing;
- Application of cable route survey data to refine the cable route and design to avoid external hazards (landslides, steep slopes, anchorages); and
- Maximized use of existing infrastructure and landing sites, which provides site and operating history that can be used in routing and cable design.

No mitigation measures are required.

4.8 Terrestrial and Marine Biology

4.8.1 Existing Conditions

4.8.1.1 Terrestrial Biology

The proposed project area is located in Kaena Point State Park and adjacent to the the Ka‘ena Point Natural Area Reserve. The Reserve consists of 34 acres on the northwestern tip of O‘ahu and protects the last somewhat intact coastal dune ecosystem on O‘ahu. Birds common to the reserve include Laysan albatross (*Phoebastria immutabilis*) and wedge-tailed shearwater (*Puffinus pacificus*) (State of Hawai‘i DLNR 2003).

The beach area is predominantly sand, but there is a grassy area makai of Farrington Highway, near the conduit ends (which are subsurface and not visible). Table 4-1 lists plant species observed at the beach area and near the BMH in May 2007. Figure 4-5 is a photo of the project area vegetation from April 2007.

Table 4-1. Plants Observed at the Project Site

Scientific Names	Common Name
BORAGINACEAE	
Cordia subcordata (Lam.)	kou
CONVOLVULACEAE	
Ipomoea pes-caprae (L.) R.Br.	pōhuehoe
FABACEAE	
Leucaene leucocephala (*Lam.*) deWit	koa haole
LAMIACEAE	
Leonotic nepetifolia (L.) R. Br.	lion’s ear
MALVACEAE	
Malachra alceifolia Jacq.	----
POACEAE	
Cenchrus ciliaris L.	buffel grass
Cynodon dactylon (L.) Pers.	bermuda grass
Panicum maximum Jacq.	guinea grass
STERCULIACEAE	
Waltheria indica L.	‘uhaloa

Source: AMEC 2007.

Figure 4-5. Plants Observed at Project Site

4.8.1.2 Marine Biology

The marine resources considered for this analysis include nearshore (<25 m [82 ft] water depth) and offshore biological communities in the vicinity of the proposed project site at Keawa‘ula Beach. The project route avoids the Marine Protected Area offshore Ka`ena Point, as well as the Humpback National Marine Sanctuary along two areas of the O‘ahu coast.

<u>Nearshore Biological Resources</u>

Existing conditions within the nearshore zone were evaluated by a team of research divers who conducted a survey along the proposed cable route in May 2007, from the 25 m [82 ft] water depth contour to the surf zone (approximately 1.5 m [5 ft] water depth) (AMEC 2007). In addition to observing existing conditions along the proposed cable route, divers evaluated a series of 17 transects perpendicular to the alignment, at predetermined intervals from 25 to 4 m [82 to 13 ft] water depth, to obtain additional information on the biological and physical characteristics within a corridor surrounding the alignment. The dive survey findings observed and recorded three distinct zones, as measured in linear distance from shore: a nearshore zone (0-150 m [0 to 492 ft]), a reef platform zone (150-250 m [492 to 820 ft]), and a deep reef platform zone (beyond 250 m [> 820 ft]). The dive team included a specialist in nearshore

Hawai‘ian marine biology, who recorded the predominant marine resources (e.g. corals) within a 6-m-wide (20-ft) corridor along the proposed cable route as well as the 17 transects. During these underwater investigations, notes on species composition were recorded, and conditions of the area were documented by digital photographs/video. The survey report is contained in Appendix A, and includes photos taken during the survey showing the habitat.

The dive survey found the biological community assemblages within the nearshore survey corridor varied from generally sparse to discrete limited zones of moderate abundance and diversity. In general, reef fish and coral communities are lower in abundance and diversity in this area relative to other nearshore environments surrounding O‘ahu. This relative lack of biological development is likely the result of the geological characteristics (i.e., distinctive bottom type) combined with exposure to significant seasonal wave action (e.g., sand scour and concussive force).

The intertidal flat to 3 to 5 m (10 to 16 ft) water depth is relatively barren and exposed to significant wave action throughout the year. Most exposed hard substrate areas deeper than 6 m (20 ft) are sparsely (<5 percent) populated by small to medium sized (5-50 cm [2 to 20 in]) hemispheric coral heads (primarily *Pocillopora meandrina*) that provide habitat for a limited number of small reef fishes and other macro-biota (e.g. sea urchins, moray eels). Most of the largest coral heads (*Pocillopora eydouxi*) observed in the study area were growing on exposed cables in deeper waters (≤15 m [49 ft]). Increased colonization was also noted on cables in shallower water where cables provided either a hard substrate above a sandy bottom or additional relief above the fossilized reef. Macroalgae were also sparse to moderate in abundance and low in diversity.

The most biologically diverse area is found on a shallow, elevated reef platform approximately 230-250 m (755 to 820 ft) offshore in 4 to 6 m (13 to 20 ft) water depth. Biotic colonization of the reef platform is the highest of any zone surveyed and consists primarily of wave-resistant corals and algae as well as sea urchins and sea cucumbers. In total, the living coral (~12 species) in this biotope covered on the order of 20 percent of the reef platform and provides habitat for other macro biota. Approximately half of the coral heads on this shallow reef platform were non-living, but readily recognizable skeletons. A predominant feature of this platform reef is the presence of a 0.5 m (1.6 ft) deep notch cut into the reef platform to accommodate two existing cables.

Table 1 in Appendix A provides a detailed summary of the abundance of reef fish and coral heads observed along each of the 17 transects evaluated during the May 2007 dive survey. No species of fish, algae, or coral that are listed as endangered, threatened, or species of concern for the state of Hawai‘i were reported or observed during the survey, except for the monk seal (noted below).

Offshore Biological Resources

Sensitive offshore species of concern for the proposed project site were discussed during a May 2007 meeting between AMEC and the National Oceanic and Atmospheric Administration (NOAA) and subsequent telephone conversations (Graham 2007). Hawai‘ian marine protected species that may occur in the vicinity of the proposed project area include the federally threatened green sea turtle (*Chelonis mydas*), the federally endangered Hawai‘ian monk seal (*Monachus schauinslandi*), the federally endangered humpback whale (*Megaptera novaeangliae*), and the spinner dolphin (*Stenella longirostris*) (Graham 2007).

Keawa‘ula Beach and the immediate inshore area is not known or identified for nesting or basking by the green sea turtle. Immature turtles are known to be present and juvenile strandings have been reported in the vicinity. Similarly, Keawa‘ula Beach is not known or identified as a pupping location for Hawai‘ian monk seals. Seals may haul-out at the site, but it is generally not considered to be a haul-out location (Graham 2007). One Hawai‘ian monk seal was observed during the 22 May 2007 diving survey of the proposed project site approximately 800 m (2,625 ft) from shore.

The endangered humpback whale is known to frequent island waters in their annual migrations to Hawai‘ian wintering grounds. They normally arrive in island waters about December and depart by April, but are known to occur from October to June. In general, their distribution in Hawai’i appears to be limited to 180 m (590 ft) water depth and shallower (Graham 2007).

Pods of spinner dolphins are frequently encountered along O‘ahu’s leeward coast. Keawa‘ula Beach is a preferred resting area for the dolphins after feeding. Spinner dolphins rest during the day at approximately sunrise and then again from 3 to 6 pm (Graham 2007).

Fisheries resources within the proposed project area are managed by the National Marine Fisheries Service (NMFS) and Western Pacific Fisheries Management Council (WPFMC).

WPFMC is responsible for the creation of management plans for fishery resources (FMPs) and identification of essential fish habitat (EFH) in Federal waters off the coasts of American Samoa, Guam, Hawai‘i, the Northern Marianas Islands and other US Pacific islands.

Within the Hawai‘ian archipelago, WPFMC has established FMPs for Western Pacific crustaceans, Western Pacific precious corals, bottomfish and seamount groundfish, Western Pacific pelagic fish, and coral reef ecosystems. The coral reef ecosystem FMP identifies EFH from nearshore to a water depth of 50 fathoms. EFH is defined as "those waters and substrates necessary for fish to spawn, breed, feed, or grow to maturity."

4.8.2 Short-Term Impacts

4.8.2.1 Terrestrial Biology

Impacts to terrestrial botanical resources are anticipated to be less than significant as no threatened or endangered species are known to exist at the landing site, where activity will be limited to the beach, conduit end, and near the BMH. Short-term disturbance to the flat grassy area between the Farrington Highway and the beach would occur during excavation to expose the conduit end and bury the cable (and AAG cables) on the beach. In addition, the area around the BMH is currently covered with tall grasses which would be trimmed back, but not uprooted, to allow working around the BMH during installation. The area around the BMH that would be trimmed is approximately 50 m^2. Following the completion of construction activities, the contractor would return the site to its preconstruction condition. Excavated areas within the cable easement are expected to re-vegetate quickly because the existing vegetation there is fairly invasive. However, the contractor will discuss with resource agencies whether re-planting is advised. Therefore, short-term impacts to terrestrial biological resources are expected to be less than significant and temporary.

4.8.2.2 Marine Biology

Potential short-term and temporary impacts on marine biological resources from the proposed project could occur during the cable laying and nearshore landing operations. These impacts may include noise from the cable ship, support boats, or shore operations; potential for collision with the cable ship or support boats; contact with the cable and/or cable floats during cable installation; and damage to coral during cable placement on the seabed.

Disturbance from noise and activity – the cable will be laid along a pre-defined route, and during the main lay the vessel moves at a consistent speed along the alignment. The vessel's movement is predictable and, based on industry experience; animals tend to avoid the vessels. Similarly, the activity from the support boats and divers tend to be avoided by marine species. These activities will be completed over a few days, during which the actual activity will be intermittent (e.g., positioning the vessel, landing the cable, removing floats).

Potential for collision or contact with cable-laying equipment – as noted above, the cable ship will move at a consistent speed that is sufficiently slow that mammals, in particular, can avoid the vessel. As a means of preventing collision or other contact with protected species, Marine Protected Species Protection Protocols will be established and implemented by an onboard observer, as discussed under Mitigations below.

Potential direct impact on corals – during the biological dive survey the proposed route was planned with a view to minimizing the potential for impact to corals. Nevertheless, corals were observed along the selected alignment, and in some sections of the route there is a potential for coral to be impacted. Within the constraints imposed by the amount of slack available, the effects of direct impacts to coral can be reduced by divers manually repositioning the cable away from impacted organisms after the floats have been cut and the cable has sunk to the bottom. It is expected there will be no significant effects on to corals, and that any impacts will be short-term (no permanent damage), but proposed mitigation will be developed in consultation with NOAA (Eberson 2007). See discussion under Mitigations below. As noted above, the only species observed during the 2007 survey that is listed as endangered, threatened, or species of concern for the state of Hawai‘i was the monk seal.

The effects described above are very localized, short-term impacts that will not adversely affect the long-term health of the habitat in the project area. This expectation is supported by observed conditions where previous cables have been installed. Disturbance to marine resources, if any, will be limited to the duration of the specific activity. Impacts to corals, if any, will be mitigated as described below.

4.8.3 Long-Term Impacts

4.8.3.1 Terrestrial Biology

There are no long-term impacts to terrestrial biology.

4.8.3.2 Marine Biology

The presence of the cable will not degrade or otherwise adversely affect marine species or habitat in the project area. The cable is non-polluting.

Present conditions documented during the May 2007 dive survey provide confirmation that the long-term presence of multiple cables has not affected the health or biotic community structure in the project area. Existing cables cross the reef platform and in some locations are the areas of highest coral colonization (AMEC 2007). Where the cables cross sand flats, they are partially or completely buried, again providing conditions that could not be considered detrimental to biotic community structure or long-term health of the habitat.

The cables presently installed at Keawa‘ula have not experienced faults, which is an indication that the present routing and design has provided adequate protection to avoid damage that could lead to repairs. The proposed Australia-Hawaii cable has been routed to take advantage of reef gaps and similar features followed by existing cables, and would also use articulated pipe in high scour areas to protect and maintain the stability of the cable.

As a result, placement of a new cable in this same area should not pose any adverse long-term impacts to the marine species, marine habitats or essential fish habitat off of Keawa‘ula.

4.8.4 Mitigation Measures/Best Management Practices

4.8.4.1 Terrestrial Biology

BMPs that will be implemented to reduce the potential for impacts:

- Following the completion of construction activities, the contractor will return the site to its preconstruction condition.

No mitigation is recommended. The existing vegetation, which consists of invasive species, will be allowed to revegetate. However, Alcatel-Lucent will discuss with resource agencies whether re-planting is advised and will prepare revegetation plans accordingly if that is advised.

4.8.4.2 Marine Biology

BMPs that will be implemented to reduce the potential for impacts:

- Vessel crew will be briefed on the specific requirements to be adhered to during installation in the project area so they are fully aware of issues or resources with project-specific procedures or reporting requirements.
- Inshore installation procedures are based on an established route that was developed in concert with the marine biological dive survey so procedures are aligned with site-specific considerations. Corals and reef structures were factored into the route planning.

Mitigations:

- Marine Protected Species Protection Protocols shall be implemented by an onboard observer during installation to identify and take actions (if needed) to avoid disturbance of or contact with an animal (mammals and turtles). A draft of the protocols was provided to NOAA for review and comment; NOAA's comments have been incorporated into the protocols, which are provided in Appendix C. Key elements of the protocols are: onboard observer with responsibility for maintaining a watch for animals and authority to suspend operations to avoid contact; emergency contacts for mammal and turtle strandings; and reporting requirements for any incident that may occur. Designated resource agency managers will be contacted for any incidents involving marine mammals or sea turtles. The "hotline" numbers shall be included on the protocols noted above, and incidents shall be documented in the ship's daily log.
- An observer shall be present onshore prior to beach activities to ensure there are no turtles or seals present at the beach prior to staging equipment and commencing operations. This measure will avoid the potential for contact or harassment with an animal.
- A video transect of the installed cable alignment will be conducted from shore (visibility in the surf zone allowing) to the 25-m (82 ft) water depth contour to document post-installation conditions. Telstra will formulate a mitigation plan, based on observed conditions, with input from the relevant resource agencies. Mitigation will be developed, as required, to provide an adequate and appropriate means of addressing site-specific and species-specific impacts.

4.9 Air Quality

4.9.1 Existing Conditions

The following air quality discussion will be focused on the proposed project in terms of federal and state regulations for air pollutant standards and emissions. Air quality in a given location is determined by the concentration of various pollutants in the atmosphere. National (and State) Ambient Air Quality Standards (NAAQS) have been established by the U.S. Environmental Protection Agency (USEPA) and DOH. NAAQS represent maximum levels of background pollution that are considered safe, with an adequate margin of safety, to protect public health and welfare. Criteria pollutants include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), inhalable and fine particulate matter (PM_{10} and $PM_{2.5}$), and airborne lead (Pb). Federal and Hawai‘i Ambient air quality standards are presented in the Table 4-2.

Table 4-2. State and Federal Ambient Air Quality Standards

Air Pollutant	Averaging Time	Hawai‘i State Standard	Federal Primary Standard	Federal Secondary Standard
CO	1-hour	10,000	40,000	40,000
	8-hour	5,000	10,000	10,000
NO_2	Annual	70	100	100
PM_{10}	24-hour	150	150	150
	Annual	50	50	50
$PM_{2.5}$	24-hour	N/A	65	65
	Annual	N/A	15	15
O_3	1-hour	N/A	235	235
	8-hour	157	157	157
SO_2	3-hour	1,300	N/A	1,300
	24-hour	365	365	N/A
	Annual	80	80	N/A
Lead	Calendar Quarter	1.5	1.5	1.5
Hydrogen Sulfide	1-hour	35	N/A	N/A

Source: Hawai‘i Administrative Rules Section 11-59; U.S. 40 Code of Federal Regulations Part 50

4.9.1.1 Climate

The major Hawai‘ian Islands lie within the tropics, but have a subtropical climate owing to the cooling influence of currents from the Bering Sea. Northeasterly trade winds persist throughout most of the year, although southerly Kona winds occasionally blow for several days at a time.

These light and variable southeast winds bring hot, humid weather in the summer and occasional fierce storms with high waves, wind, and rain in the winter. Average wind speeds are highest during the summer and often exceed 12 miles per hour. Areas receiving the greatest amount of rainfall are on the windward, or northeastern, sides of the islands. Humidity on the islands is typically high except along the drier (i.e., leeward) coasts and at higher elevations (Sandwich Isles Communications 2004).

The climate of Wai‘anae is generally hot and dry along the coastal areas and in the lower sections of the valleys. Cooler and wetter conditions prevail in the upper sections of the valley and on up into the Wai‘anae Mountains. Average annual rainfall ranges from less than 20 in along the coast to more than 75 in near the summit of Mount Kaala (City and County of Honolulu 2000).

4.9.1.2 Regional Setting

Air quality in the State of Hawai’i is typically excellent, owing to offshore trade winds that help disperse most urban air pollutants. Data collected by DOH indicate that the State has some of the best air quality conditions in the nation. To monitor air quality, DOH operates a network of stations at various locations throughout the islands. Nine air quality monitoring stations are located on the island of O‘ahu, in and around the metropolitan area of Honolulu. These stations monitor carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (PM_{10} and $PM_{2.5}$), ozone (O_3), and nitrogen dioxide (NO_2). The most recent data available (2005) indicate that emissions for PM_{10} exceeded state significance thresholds once. All other monitored criteria pollutants were measured at levels below state and federal significance thresholds (DOH 2005).

4.9.2 Short-Term Impacts

The excavator and small diesel-powered winch will generate emissions while they are operating intermittently during the 6 to 10 days of the installation. Because of the short duration of the equipment use, and because the operations will not be continuous during this period, the emissions will be negligible and therefore not significant.

Ground disturbance to beach sand to expose the conduit will be very limited in area and is not expected to generate a significant amount of dust. Vegetation around the BMH will be cut but not cleared so there should be no exposure of topsoil at that location which could generate dust.

4.9.3 Long-Term Impacts

No long-term impacts to the area's ambient air quality are anticipated because the work site will be restored to its original condition following the completion of installation activities. No additional activity is required once the cable is installed.

4.9.4 Mitigation Measures/Best Management Practices

The BMP relevant to air quality is to maintain construction equipment and vehicles shall in proper working order to reduce air emissions.

4.10 Noise

4.10.1 Existing Conditions

Average noise exposure over a 24-hour period is often presented as a community noise equivalent level (CNEL), measured in decibels (dB). CNEL values are calculated from average hourly noise levels, in which the values for the evening period (7 PM to 10 PM) are increased by five dB, and values for the nighttime periods (10 PM to 7 AM) are increased by 10 dB. Such weighting of evening and nighttime noise levels is intended to take into account the greater human disturbance potential of nighttime noises.

The DOH developed objectives and strategies guiding the noise environment of communities in Hawai'i (DOH 2004). State noise guidelines are outlined in the Hawai'i Administrative Rules Chapter 11-46. These guidelines identify maximum allowable noise levels within zoning districts (Table 4-3).

Table 4-3. Maximum Permissible Noise Levels

Zoning District	Daytime (7 AM to 10 PM) (dBA)	Nighttime (10 PM to 7 AM) (dBA)
Residential, Conservation, Preservation, Public Space, Open Space	55	45
Apartments, Business, Commercial, Hotel, Resort	60	50

Source: DOH 1996.

The proposed cable landing site is located in an area zoned "Preservation." Ambient noise levels in the nearshore project area are predominantly from local vehicular traffic on Farrington Highway, ocean surf, and activities at the Makua Military Reservation.

4.10.2 Short-Term Impacts

During installation activities, excavation, winching, and vessels will provide an additional, temporary source of noise above ambient levels at the project area, where there are no residential or sensitive stationary receptors (the presence of beach users fluctuates).

Noise from the winch and excavator will be intermittent and temporary, occurring within a 6- to 10-day period. The noise effects will be localized and temporary, and therefore are not considered significant.

Boats and other vessels used during installation will also be an additional source of noise. The noise will be temporary (approximately one day at the project site, where the public could potentially hear the vessel offshore) and will not be significant. (Effects of noise on marine biota are discussed in Chapter 4.8.)

4.10.3 Long-Term Impacts

There would be no project-related noise once construction is completed.

4.10.4 Mitigation Measures/Best Management Practices

The BMP relevant to noise impacts is: Equipment shall be maintained in proper working order, especially all noise suppression systems, if applicable.

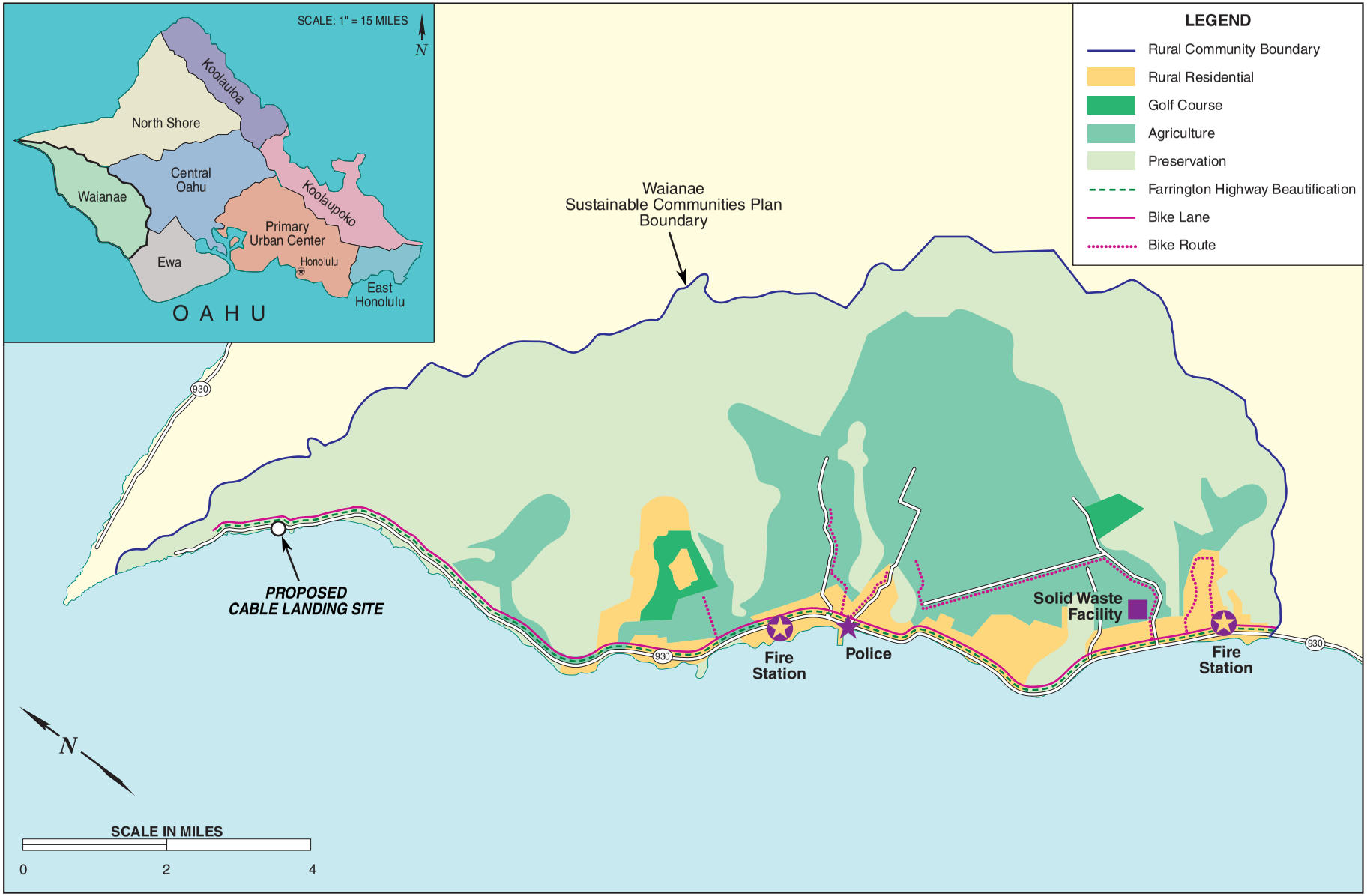
4.11 Public Facilities

4.11.1 Existing Conditions

This section identifies the services and public infrastructure supporting the Waiʻanae District and the cable landing site. According to the Waiʻanae *Sustainable Communities Plan*, public facilities in the Waiʻanae District are concentrated near Makaha (approximately 8 km [5 mi] from the project site) and the other towns in the southern portion of the District.

4.11.1.1 Recreational Facilities

The project site is within Ka`ena Point State Park, as discussed in Chapter 4.2, Land Use. Park facilities include a lifeguard station and public restroom, picnic area, showers and telephones located at the entrance of the beach area. The public accesses the beach via Farrington



EA

Public Facilities in the Vicinity of the Proposed Project

FIGURE 4-6

Highway, parking along the sides of the highway No other public facilities are located on or near the proposed cable landing site, which is generally undeveloped.

4.11.1.2 Transportation Facilities

The project site is served by the Farrington Highway, the primary means of accessing the project area. No bus routes or other transit services travel to the site.

4.11.1.3 Telecommunication Facilities

As described in Chapter 2, there is an existing landing, conduit, BMH and cable station at the project site, which provide the infrastructure to connect to other telecommunication networks in Hawai‘i, the mainland, and elsewhere in Asia Pacific.

4.11.2 Short-Term Impacts

During installation the contractors will control access to the work areas on the beach, and near the vessels to maintain safe distances between the public and activity. As described in Chapter 2, the project activity will not preclude use of the park, and the beach will remain open during the 6 to 10 days of activity. An example of a similar installation on a high-use beach was provided in Chapter 2 to demonstrate how controlled access can maintain safety while allowing recreation to continue. Similar procedures will be employed for the Australia-Hawaii installation.

The project will use the existing conduit that extends from the BMH beneath Farrington Highway to the beach. Therefore, no trenching or other disturbance to Farrington Highway is proposed or necessary. Equipment will access the site along Farrington Highway for initial staging and demobilization, and as necessary traffic control may be employed for public safety while the equipment is being delivered to the site.

As discussed above, the only connection necessary to connect the Australia-Hawaii system to other networks at Keawa‘ula is via the BMH and cable station. No additional conduit or construction will be required. The ocean grounding bed will be located at the cable station.

The project will not require closure or modification of public facilities. Installation will present limited and controlled public access near the work areas during some portions of the 6- to 10-day installation period. Therefore the impacts on public facilities are not considered significant.

4.11.3 Long-Term Impacts

There would be no project-related impacts to transportation or public utilities following completion of construction activities. Implementation of the proposed project would not require any additional police or fire service and would not require the extension of current public utilities to the project site. The project will have a long-term benefit on telecommunication capacity in the state because of increased access to trans-Pacific networks, and increased diversity in the existing networks.

Therefore there will be no long-term adverse impacts to public facilities.

4.11.4 Mitigation Measures/Best Management Practices

The BMPs relevant to reducing impact on public facilities were discussed in Chapter 4.2, Land Use, and address coordination and advance notice of activities as they may affect recreational use at Ka‘ena Point State Park and other nearby parks and schools.

CHAPTER 5: SECONDARY AND CUMULATIVE IMPACTS

The purpose of this chapter is to discuss secondary and cumulative impacts that could potentially result from the proposed project.

Secondary impacts, also known as indirect impacts, are those impacts that occur later in time or at a more distant location, but are reasonably foreseeable results of the original action. Examples of secondary impacts include changes in land use patterns, population density or growth rate, and related impacts on the natural environment.

Cumulative impacts result from implementing several individual projects in the same geographic area and/or time frame, even though each may have limited impacts separately. Cumulative impacts of interlinking separate submarine cable projects are discussed below, as well as impacts potentially resulting from implementation of other unrelated projects.

5.1 Secondary Impacts

5.1.1 Potential Impacts of the Submarine Cable

There are no expected secondary impacts from the cable. The introduction of the Australia-Hawaii cable would not cause secondary impacts on resources or changes to the local community or resource use.

5.1.2 Potential Impacts at Landing Site

The Australia-Hawaii cable system would not affect development that is already planned in the Wai‘anae District.

Impacts associated with this project are related to installation activities and would therefore not persist after installation is complete. The project would not generate migration to the local area. Accordingly, the project would not create a significant increase in or impact upon resident population, housing, demand for public facilities and services, land use patterns, public infrastructure, and the natural environment.

Because no secondary impacts are anticipated, no mitigation measures are proposed.

5.2 Cumulative Impacts

5.2.1 Potential Impacts of Submarine Cable

In addition to the proposed project, another similar submarine cable project is currently being planned to land at the same landing. However, the potential for incremental environmental impacts on the marine environment from both the proposed project and the AAG project is being avoided by coordination of the two projects, as described in Chapter 2. The Australia-Hawaii project team has coordinated extensively with the AAG project team to align schedules and installation methods that will minimize disturbance, reduce the total duration of the installations, and provide consistent information to the local community, beach users, and permitting agencies.

No cumulative impacts are anticipated to occur from the proposed project.

5.2.2 Potential Landing Site Impacts and Interactions with Planned Projects

Impacts at the landing site would be temporary and related to installation. The area affected is also confined to the beach and nearshore. No known Waiʻanae District projects are located on or immediately adjacent to the proposed project site at Keawaʻula Beach; therefore implementation of local projects would not affect or be affected by the proposed project.

Because no cumulative impacts are anticipated, no mitigation measures are proposed.

CHAPTER 6: CONSISTENCY AND COMPLIANCE WITH FEDERAL, STATE AND LOCAL REGULATIONS, PLANS, AND POLICIES

6.1 Federal Regulations

6.1.1 Rivers and Harbors Act Section 10

Section 10 of the Rivers and Harbors Act (33 United States Code [USC] 401 et seq.) requires authorization from the U.S. Army Corps of Engineers (USACE) for the construction of any structure in or over any navigable water of the United States, the excavation/dredging or deposition of material in these water or any obstruction or alteration in a navigable water. Structure or work outside the limits defined for navigable waters of the U.S. require a §10 permit if the structure or work affects the course, location, condition, or capacity of the water body.

As part of the review, the USACE will consult with other federal agencies, as noted below.

6.1.2 Clean Water Act Section 404/401

According to the Federal Clean Water Act (CWA), discharge of dredged or fill material into the waters of the U.S. requires a Section 404 permit from the USACE and a Section 401 Water Quality Certification (WQC) from the state. Waters of the U.S. include all surface waters: navigable waters and their tributaries, all interstate waters and their tributaries, all wetlands adjacent to these waters, and all impoundments of these waters. Typical activities requiring Section 404 permits are:

- Depositing of fill or dredged material in waters of the U.S. or adjacent wetlands.
- Site development fill for residential, commercial, or recreational developments.
- Construction of revetments, groins, breakwaters, levees, dams, dikes, and weirs.
- Placement of riprap and road fills.

The project will not require dredge or fill, but during installation sediments will be redistributed, and the USACE will review the project for compliance with the CWA.

6.1.2.1 Section 401 Water Quality Certification

The 401 WQC is required from State of Hawai‘i Department of Health (DOH) Clean Water Branch prior to USACE approval of a Section 404 permit. These permitting processes work in

tandem and require similar information. 401 WQC will be reviewed to assess the potential impacts on water resources.

6.1.3 Endangered Species Act and Other Laws Protecting Biological Resources

Section 7 of the Endangered Species Act (ESA) requires that federal agencies consult with the U.S. Fish and Wildlife Service (USFWS) and/or the National Atmospheric and Oceanic Administration (NOAA) to ensure that actions they authorize, fund, or carry out are not likely to jeopardize the continued existence of any federally listed threatened or endangered species, or result in the destruction or adverse modification of a critical habitat. Other applicable federal laws include:

- Magnuson-Stevens Fishery Conservation and Management Act, reauthorized as the Sustainable Fisheries Act;
- Marine Mammal Protection Act
- Fish and Wildlife Coordination Act; and
- Migratory Bird Treaty Act.

Consultation will be conducted by the USACE during the processing of the permit application. The proposed project is not expected to impact sensitive plants or animals, marine mammals, or migratory birds and is therefore considered consistent with the above-listed policies.

6.1.4 National Historic Preservation Act (NHPA)

Section 106 of the NHPA requires that federal agencies consider the effect of their actions on any district, site, building, structure or object that is included or eligible for inclusion in the National Register of Historic Places (NRHP). Such resources are called “historic properties.” Under Section 106, a federal action (or undertaking) may involve federally funded projects, activities, or programs, including those carried out with federal financial assistance. Federal actions also include projects requiring a federal permit, license or approval, including those where federal authority has been delegated to a state or local agency.

Section 106 Review refers to the Federal review process designed to ensure that historic properties are considered during Federal project planning and implementation. Section 106 requires consultation with the State Historic Preservation Officer (SHPO) and other agencies and organizations that may have an interest in or are mandated to protect historic properties. In

addition, the Advisory Council on Historic Preservation (ACHP) is afforded the opportunity to comment on actions that may potentially affect historic properties.

This project must comply with Section 106 because the proposed project is located in an area where potential historic resources might exist and requires federal agency action through a Rivers and Harbors Act, Section 10 permit. An archaeological assessment was conducted in June 2007 and the report is being prepared to submit to the SHPO.

6.2 State Plans, Policies and Regulations

6.2.1 Hawai‘i State Plan

The Hawai‘i State Plan, Chapter 226 of the Hawai‘i Revised Statutes, serves as a guide for future long-range development of the state. It consists of comprehensive goals, objectives, policies, and priorities for all areas of government functions. These functions include the protection of the physical environment, the provision of public facilities systems, and the promotion and assistance of socio-cultural advancement. Policies applicable to the proposed project are listed below.

Objectives and policies for the economy – potential growth activities (226-10)

- Increase research and development of businesses and services in the telecommunications and information industries.

Objectives and policies for the economy – information industry (226-10.5)

- Encourage development and expansion of the telecommunications infrastructure serving Hawai‘i to accommodate future growth in the information industry.
- Provide opportunities for Hawai‘i’s people to obtain job training and education that would allow for upward mobility within the information industry.

Objective and policies for facility systems – in general (226-14)

- Accommodate the needs of Hawai‘i’s people through coordination of facility systems and capital improvement priorities in congruence with state and county plans.
- Ensure that required facility systems can be supported within resource capacities at reasonable cost to the user.

Objectives and policies for facility systems – telecommunications (226-18.5)

- To ensure provision of adequate, reasonably priced, and dependable telecommunications services to accommodate demand.
- Encourage public and private sector efforts to develop means for adequate, ongoing telecommunications planning.

6.2.2 Hawai‘i State Land Use Controls

Lands in the state are divided into four classifications: Urban, Agricultural, Rural, and Conservation. The proposed project site is located in the Conservation District and would therefore require a Conservation District Use Permit (CDUP). No land use change is required for the cable landing.

6.2.3 Conservation District Use Permit

Hawai‘i Revised Statutes Chapter 183C, Conservation Districts, directed the DLNR and the Board of Land and Natural Resources to manage and regulate the Conservation District, including:

- Maintaining an accurate inventory of lands classified within the state Conservation District;
- Appropriately zoning lands within the Conservation District;
- Establishing appropriate uses or activities on conservation lands, including uses or activities for which no permit would be required; and
- Establishing and enforcing land use regulations including the collection of fines for violations of land use and terms and conditions of issued permits or approvals.

The Conservation District includes all submerged lands from the shoreline to a distance of 12 miles offshore. Therefore, in addition to the landing site itself, all landing site infrastructure seaward of the shoreline would be within the Conservation District, Limited subzone and subject to CDUP requirements.

According to Section 13-5.22 of the Hawai‘i Administrative Rules, Identified Land Uses in the Protective Subzone, P-6, Public Purpose Uses, (D-2), “communications systems and other such land uses which are undertaken by non-governmental entities which benefit the public” are allowed with a CDUP. Hawai‘i Administrative Rules Section 13-5.23, Identified Land Uses in the Limited Subzone, states that “all identified land uses and their associated permit or site plan approval requirements listed for the protective subzone also apply to the limited subzone unless otherwise noted.”

6.2.4 Hawai‘i Revised Statutes Chapter 6E

Hawai‘i Revised Statutes Chapter 6E is the State counterpart law to the NHPA. This statute places similar responsibilities on state agencies as NHPA Section 106 places on federal agencies. Hawai‘i Revised Statutes Section 6E-8 states that before any agency or officer of the state or its political subdivisions (i.e., counties) commences or permits any project which may affect historic property, aviation artifact, or a burial site, it must provide the SHPO an opportunity for review.

6.2.5 State Endangered Species Law, HRS Chapter 195D

Hawai‘i Revised Statutes Chapter 195D is the State counterpart law to the Endangered Species Act. Similar to Section 7 of the Endangered Species Act, Chapter 195D, which is administered by the DLNR Division of Forestry and Wildlife requires evaluation of the project’s potential impacts on threatened and endangered species.

6.2.6 Coastal Zone Management

The Coastal Zone Management Act (CZMA) was passed to encourage states to preserve, protect, develop, and where possible, restore or enhance valuable natural coastal resources. The State of Hawai‘i CZMA program was established through passage of Hawai‘i Revised Statutes Chapter 205A in 1977. All federally proposed activities or activities that require a federal permit or license are required to be consistent to the maximum extent practicable with the CZMA program. The CZMA program is administered by the DLNR Division of Conservation and Resources Enforcement.

6.3 County Plans, Policies and Regulations

6.3.1 Special Management Area and Shoreline Setback

The Hawai‘i CZMA program designated the areas along the shoreline for “special controls on developments to avoid permanent losses of valuable resources and the foreclosure of management options, and to ensure that adequate access by dedication or other means, to publicly owned or used beaches, recreation areas, and natural reserves is provided” (Hawai‘i Revised Statutes Section 205A-21). To accomplish these objectives, Hawai‘i Revised Statutes Chapter 205A established the Special Management Area and shoreline setbacks, and

authorized counties to develop and administer permitting systems to control development within both.

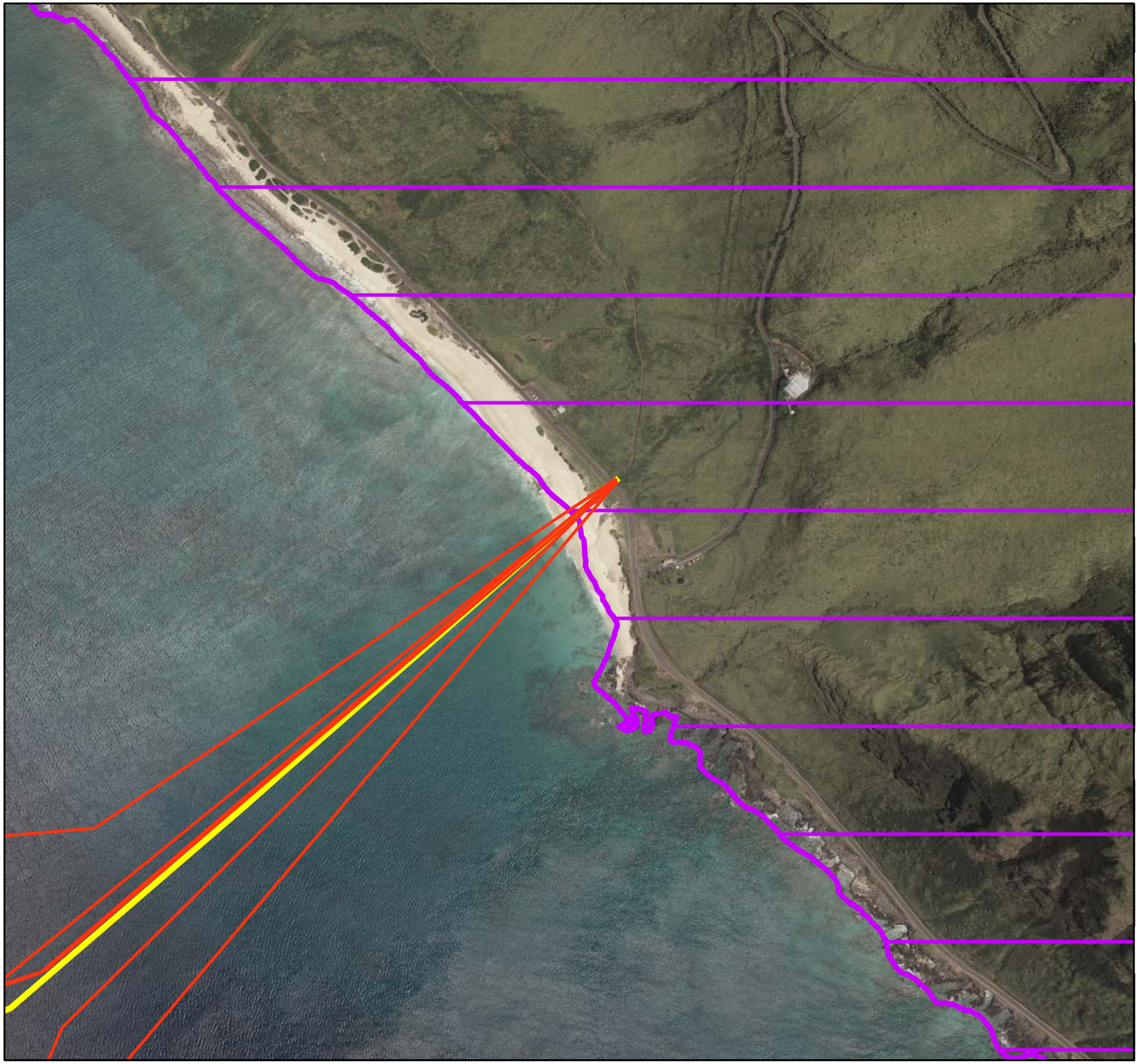
The Special Management Area is a regulated zone extending inland from the shoreline to a landward boundary delineated by the counties. The landward boundary of the Special Management Area can vary from a few dozen feet to more than a mile. The proposed project area is a Special Management Area; however, the proposed project does not include development as defined in the statute. Therefore, the proposed project is consistent with this policy. Figure 6-1 shows the SMA boundaries and the proposed project relative to existing cables in the project corridor.

A shoreline survey was conducted by a registered land surveyor in July 2007 and is illustrated in Figure 6-2 (page 6-9). This survey has been submitted to the State Land Division for certification. Based on preliminary discussions with the DLNR Office of Conservation and Coastal Land, a portion of the area to be excavated, and the equipment staging area, may fall within the shoreline setback area. Therefore, a Shoreline Setback Variance (SSV) may be required. An SSV application will be submitted, if required, upon release of this Final EA and Finding of No Significant Impact.

6.3.2 City and County of Honolulu General Plans

The General Plan of the City and County of Honolulu (1992) provides a statement of long-range social, economic, environmental, and design objectives for the Island of O‘ahu and a statement of policies necessary to meet these objectives. The following policies are applicable to the proposed project:

- Economic Activity. Policy 3 – Encourage the development in appropriate locations on O‘ahu of trade, communications, and other industries of a non-polluting nature. The proposed project would provide additional telecommunications infrastructure in order to facilitate the advancement of non-polluting industries.
- Natural Environment. Policy 4 – Require development projects to give due consideration to natural features such as slope, flood and erosion hazards, water-recharge areas, distinctive land forms, and existing vegetation. The proposed project involves no development on land and would connect to an existing landing site.
- Transportation and Utilities. Policy 3 – Encourage the study and use of telecommunications as an alternative to conventional transportation facilities. The proposed project would provide telecommunications infrastructure consistent with this policy.



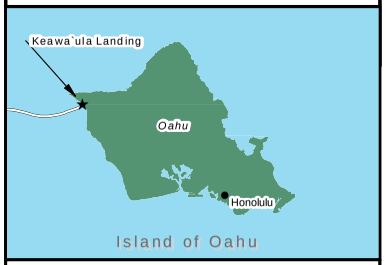
Legend

- Proposed Cable Route
- Existing Cables
- Special Management Area

Map Scale: 1:7,500

0 250 500 750 1,000
Feet

0 50 100 150 200 250
Meters



Data Sources

Proposed Cable Route: Alcatel Inc. (PSR11prov, 17 JUN 07)
Special Management Area: C&C of Honolulu GIS database (2006)
Existing Cables: C&C of Honolulu, Office of Planning (2002)
Aerial Photo: USGS (2005)

Geodetic Parameters

Datum: WGS84 Projection: Mercator
Spheroid: WGS84 Coordinate System: GCS_WGS_1984
False_Easting: 0.000000
False_Northing: 0.000000
Central_Meridian: 0.000000
Standard_Parallel_1: 0.000000
Semimajor Axis: 6378137.000000
Semiminor Axis: 6356752.3142451793
Inverse Flattening: 298.257223563
Prime Meridian: 0.000000

FIGURE 6-1

Special Management Area & Existing Cables in Project Corridor

amec

DATE: 15 NOV 2007	AUTHOR: LRK (Honolulu)
COMMENTS: None	REV: DMT (San Fran.)

FILEPATH:
hnl-fs1/hazmat/projects/Alcatel Subamrine Cable/DWG/GIS/Maps/Figure 6-1 Special Management Area.mxd

6.3.3 City and County of Honolulu Zoning Ordinances

Under the Revised Charter (1992), the Department of Planning and Permitting administers the Land Use Ordinance whose purpose is to regulate land use through its zoning powers. This is to be done in a manner that would encourage orderly development in accordance with adopted land use policies, including the O‘ahu general plan and development plans, and to promote and protect the public health, safety and welfare. Utility systems are permitted in every zoning district and are classified as being either Type A or B. The project would be considered a Type A project because it would cause minor/no impact on adjacent land uses. Type B projects, on the other hand, would cause impacts to neighboring land uses, and therefore, such projects require a Conditional Use Permit.

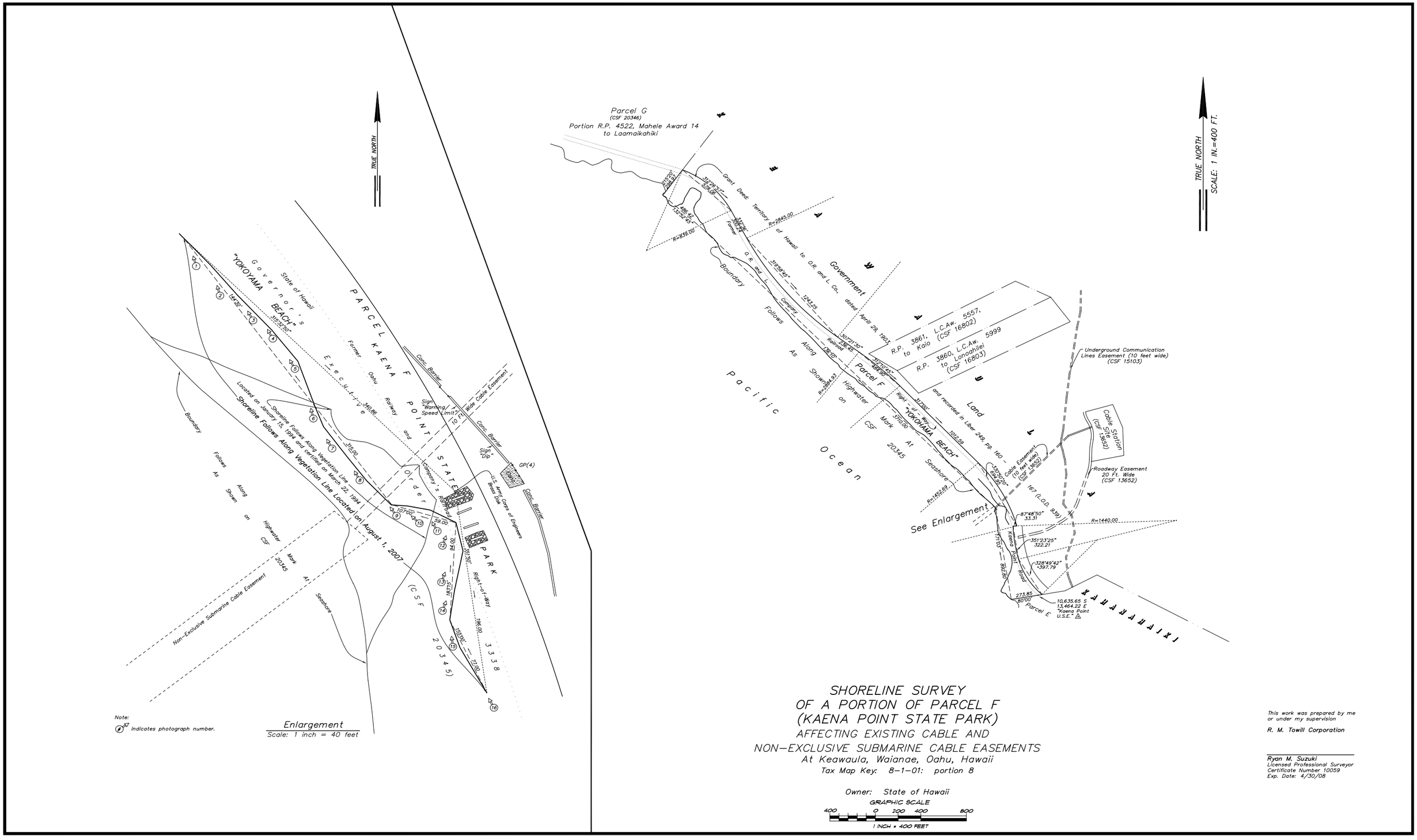
6.3.4 Wai‘anae Sustainable Communities Plan

The proposed cable project is consistent with the objectives of the *Wai‘anae Sustainable Communities Plan*. Below are excerpts from the *Wai‘anae Sustainable Communities Plan*, July 2000, and a discussion of the proposed project’s consistency with the plan.

- Chapter 1: Waianae’s Role in Oahu’s Development Pattern. *“Consistent with the directed growth policies of the City’s General Plan, the Waianae District is targeted for very little growth over the 20-year timeline of this plan. The focus of the plan is this preservation of the rural landscape and the country lifestyle of the Waianae District’s people.”*

  The proposed project involves minor installation activities as described in Section 2.4.2. The cable will be installed in an existing conduit that runs under Farrington Highway and to an existing manhole. Excavation activities and equipment staging will cause temporary visual impacts in the area, but the project will not cause long term impacts to the rural landscape and the country lifestyle of the Waianae District’s people.

- Chapter 2: The Vision for the Future of the Waianae District. *“This chapter presents a community-based vision statement for the Waianae District, and also describes the basis for this vision, including: Community Values, Rural Values and Qualities, the community*



SHORELINE SURVEY
OF A PORTION OF PARCEL F
(KAENA POINT STATE PARK)
AFFECTING EXISTING CABLE AND
NON-EXCLUSIVE SUBMARINE CABLE EASEMENTS
At Keawaula, Waianae, Oahu, Hawaii
Tax Map Key: 8-1-01: portion 8

Owner: State of Hawaii

GRAPHIC SCALE
400 0 200 400 800
1 INCH = 400 FEET

This work was prepared by me
or under my supervision

R. M. Towill Corporation

Ryan M. Suzuki
Licensed Professional Surveyor
Certificate Number 10059
Exp. Date: 4/30/08

amec

Shoreline Survey

FIGURE
6-2

This page intentionally left blank.

Participation Process, and Ahupua'a/Ecosystem Concept, and Environmental Criteria for Land Use Planning."

The project team has been working with the Wai'anae Neighborhood Board throughout the planning process. A public meeting was held at the Waianae Public Library on October 23, 2007. There were no public objections to the proposed cable project.

- Chapter 3: Land Use Policies and Guidelines. *"This chapter presents general policies and guidelines for the major land uses planned for the Waianae District."*

  The proposed project is consistent with the policies and guidelines presented in Chapter 3 which include, but are not limited to, preservation of open space, preservation of coastal lands, preservation of mountain forest land, preservation of streams and stream floodplains, preservation of historic and cultural resources, and preservation of agricultural lands.

- Chapter 4: Public Facilities and Infrastructure Policies and Guidelines. *"This chapter presents general policies and guidelines for the major public facilities and infrastructure systems in the Waianae District."*

  Guidelines for electric power and communications lines aim to reduce the visual impact of power lines and utility poles, especially along Farrington Highway. The fiber optic cable will be placed underground in an existing conduit. Therefore, no utility poles or above-ground lines are proposed or needed for this project.

6.4 List of Permits and Approvals

The following permits or approvals are expected to be required for installation of the project.

Federal

USACE

- Section 10 Rivers and Harbors Act and Section 404 CWA; consultation with NOAA and SHPO

State

DLNR

- Conservation District Use Permit
- Seabed Easement
- Construction Right-of-Entry

Office of State Planning

- Coastal Zone Management Consistency Certification

DOH, Clean Water Branch

- Section 401 CWA Water Quality Certification

City and County of Honolulu

Department of Planning and Permitting

- Shoreline Setback Variance

6.5 Consultations

In addition to the above-mentioned permits and approvals, the following consultation activities will be conducted prior to implementation of the proposed project.

- Informal Consultation on Marine mammal Protection Act and Magnusen-Stevens with NOAA
- Informal Consultation with the Hawai‘i State Historic Preservation Office

CHAPTER 7: PRE-CONSULTATION AND COORDINATION

This chapter summarizes the public and agency coordination activities for the Australia-Hawaii Cable System Project that have been conducted to date. Project scoping and coordination activities have included meetings and correspondence with government agencies, landowners, and a meeting with a neighborhood board. The Australia-Hawaii project team also coordinated with the AAG project team to discuss overall coordination of the projects' timing, method and presentation of project information in the Draft EA.

The project was introduced to permitting agencies, resource agencies and the Wai'anae Neighborhood Board to provide early information about the project, and to solicit input.

Contacts are noted below.

7.1 Regulatory Consultation and Coordination

7.1.1 Federal Agencies

Agency	Representative	Key Topics Discussed
U.S. Army Corps of Engineers (USACE)	Farley K. Watanabe Archaeologist	• USACE coordination under Section 7 (Endangered Species Act) consultation • Contents of project description in application • Impact avoidance measures • BMPs inclusion of safety plan, spill prevention plan, and biological monitoring plan • Beach access/beach works • Coastal Zone Management • Topics included in the environmental baseline studies
National Oceanic and Atmospheric Administration (NOAA) Protected Resources Division	Krista Graham Marine Resource Management Coordinator	• Protected resources: turtles, monk seals, humpback whales, spinner dolphins. • Mammal protection protocols • Process • Specific topics needed to be included in the project description
NOAA Habitat Conservation Division	Alan Everson Coral Program Coordinator	• Habitat conservation and essential fish habitat • Coral reef fishery management plan • Specific topics needed to be included in the project description • Dive survey

7.1.2 State Agencies

Agency	Representative	Topics Discussed
Department of Lands and Natural Resources (DLNR) (Conservation & Coastal Lands Division)	Samuel J. Lemmo Administrator Michael Cain Planner	• Conservation District Use Application (CDUA) and zoning permit • Comparative analysis of installation techniques • Expected biological issues • Public hearings • Land disposition • Cultural resources
DNLR (Lands Division)	Steve Molmen Supervising Land Agent Al H. Jodar Land Agent	• Lands Division process • Initial actions prior to submitting application • Appraisal • Certified Shoreline Survey
Department of Health (DOH) (Clean Water Branch)	Joanna L. Seto Environmental Engineer	• Section 401 Clean Water Act Water Quality Certification • Best Management Practices • Project classifications: Class A or Class AA • Applicability of Section 402 CWA NPDES General Construction Permit • Coordination with USACE actions

7.1.3 City and County of Honolulu

Agency	Representative	Topics Discussed
Department of Planning and Permitting	Pam Davis	• Chapter 25 Code regarding Special Management Area permit requirements • Shoreline Setback Variance (Chapter 23) applicability • Application process • Certified Shoreline Survey

7.1.4 Neighborhood Board No. 29 (Wai‘anae)

The project was introduced at the July 3, 2007, Board meeting to provide preliminary information about the project and to hear initial community comments.

CHAPTER 8: IMPACTS, MITIGATIONS, AND SIGNIFICANCE EVALUATION

This section provides a summary of the potential impacts, as evaluated in Chapter 4, and notes associated BMPs and mitigations by resource area. The impacts are evaluated for significance based on State criteria.

8.1 Summary of Impacts

Table 8-1 provides a summary of impacts.

8.2 Significance Evaluation

The assessment provided below is based on an evaluation of potential impacts relative to the "Significance Criteria" specified in HAR 11-200-12 (b). The Significance Criteria appear below in italics, followed by a brief statement relating project effects to the criterion.

1. *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource* – The proposed project will not involve an irrevocable commitment to the loss or destruction of any natural or cultural resources. Project design and planning incorporate protective measures that will avoid resource loss or destruction. Archaeological monitors and biological observers will provide additional assurance of protection for these resources.
2. *Curtails the beneficial uses of the environment* – The proposed project will not curtail the range of beneficial uses of the environment. No restriction of the beneficial uses will occur beyond the installation period, when access near the work areas will be controlled for a period of approximately 6 to 10 days.
3. *Conflicts with the State's long-term environmental policies or goals and guidelines expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders* – The proposed project is consistent with the State's long-term environmental policies, which are to conserve natural resources and enhance the quality of life. The project will use existing infrastructure to avoid new construction, and incorporates BMPs and mitigations for additional protection of resources.

Table 8-1. Australia–Hawaii Cable System Project Impacts Summary

Resource Area	Short-term Impacts	Long-term Impacts	Mitigation and BMP
Topography & Geological Resources	• Ground-disturbing activities (i.e., during site preparation and construction). • Temporary redistribution of sediments.	No impact	BMPs: • Site restoration to original condition at conclusion of project. No Mitigation required.
Land Use	• Controlled public access in a limited area of the beach at Ka'ena Point State Park.	No impact	BMPs: • Local authorities, such as State Parks and local lifeguards, will be given advance notice of the work schedule. • Controlled access to the work area for public safety, but no beach closures. Access will be controlled through a number of measures, which may include temporary fencing, signage, and staff. • Security protection of equipment for public safety. Mitigation: • Protection of coastal resources (see Archaeological and Historical Resources).
Archaeological & Historical Resources	• Potential disturbance to archaeological and historical resources during excavation.	No impact	Mitigation: • A qualified archaeological monitor will be present during excavation activities in the cable corridor; and • If potentially significant resources are uncovered during excavation or trenching activities, all excavation or trenching activity shall halt until the nature and significance of the resources can be determined by the on-site archaeologist.
Cultural, Social & Economic Resources	No impact.	No impact	See Land Use and Archaeological Resources for related BMPs and mitigations.
Visual & Aesthetic Resources	• Presence of equipment and vessels and equipment for 6 to 10 days, which will be visible to beach users.	No impact	No BMPs or mitigations required.

Table 8-1. Australia–Hawaii Cable System Project Impacts Summary (Continued)

Resource Area	Short-term Impacts	Long-term Impacts	Mitigation and BMP
Water Resources	• Localized and temporary increase in turbidity in the surf zone when cables jetted into the sediments by divers.	No impact	BMPs: • Management of refuse and general site management to prevent materials from entering drainages or ocean. • Spill prevention and response plans for vessels and site management of equipment fluids. No Mitigation required.
Marine & Nearshore Resources	No impact.	No impact	BMPs: • Use of desktop study findings to select cable design and routing; • Application of cable route survey data to refine the cable route and design to avoid external hazards (landslides, steep slopes, anchorages); and • Maximized use of existing infrastructure and landing sites, which provides site and operating history that can be used in routing and cable design. No Mitigation required.
Terrestrial & Aquatic Biological Resources	• Short-term disturbance to the flat grassy area between the Farrington Highway and the beach during excavation. • Potential for short-term disturbance to marine mammals and sea turtles by the presence of vessels and placement of cables during installation of the cable. • Potential direct effects on corals during installation of the cable on the seafloor.	No impact	BMPs: • Following the completion of construction activities, the contractor will return the site to its preconstruction condition. • Vessel crew will be briefed on the specific requirements to be adhered to during installation in the project area so they are fully aware of issues or resources with project-specific procedures or reporting requirements. • Inshore installation procedures are based on an established route that was developed in concert with the marine biological dive survey so procedures are aligned with site-specific considerations. Corals and reef structures were factored into the route planning. Mitigations: • Marine Protected Species Protection Protocols for

Table 8-1. Australia–Hawaii Cable System Project Impacts Summary (Continued)

Resource Area	Short-term Impacts	Long-term Impacts	Mitigation and BMP
			marine mammals and turtles will be implemented by an onboard observer during installation to identify and take actions (if needed) to avoid disturbance to or contact with an animal. • An observer shall be present on shore prior to beach activities to ensure there are no turtles or seals present at the beach. • Designated resource managers will be contacted for any incidents involving marine mammals or sea turtles. The "hotline" numbers shall be included on the protocols noted above, and incidents shall be documented in the ship's daily log. • A video transect of the installed cable alignment will be conducted from shore (visibility in the surf zone allowing) to the 25-m (82-ft) water depth contour to document post-installation conditions. Telstra will formulate a mitigation plan, based on observed conditions, with input from the relevant resource agencies. Mitigation will be developed, as required, to provide an adequate and appropriate means of addressing site-specific and species-specific impacts.
Air Quality	• Short-term and localized emissions from excavator and winch.	No impact	BMPs: • Construction equipment and vehicles shall be maintained in proper working order to reduce air emissions. No Mitigations required.
Noise	• Temporary source of noise above ambient levels from excavation, winch, and vessels.	No impact	No BMPs or mitigation measures required.
Public Facilities	• Disruption to a limited area of the beach at Ka'ena Point State Park.	No impact	See Land Use for related BMPs and mitigations.

4. *Substantially affects the economic or social welfare of the community or State* – The proposed project will not substantially affect the economic or social welfare of the community or State. The project will reinforce Hawai‘i’s position as a hub in trans-Pacific submarine telecommunications networks.
5. *Substantially affects public health* – The proposed project, with the implementation of BMPs and committed mitigation measures, will not adversely affect public health or safety.
6. *Involve substantial secondary impacts* – The proposed project will not result in substantial secondary impacts, such as population changes or creation of additional demands for public facilities. The project’s effects are related to installation and are temporary and not substantial.
7. *Involves substantial degradation of environmental quality* – The proposed project will not degrade environmental quality. The project’s effects are temporary and the beach area will be restored upon completion of installation. As demonstrated by similar actions at the project site, specifically the existence of other cables, the environmental quality of the area has not been adversely affected and this project would have similar effects.
8. *Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions* – The project will not have cumulative effects on the environment, or require a commitment to larger actions. The project has been coordinated with another action at the project site to minimize potential effects to the environment and community.
9. *Substantially affects a rare, threatened, or endangered species, or its habitat* – Rare, threatened, or endangered species will not be substantially affected by the project. Protective measures for turtles and marine mammals have been developed for this project, reviewed by appropriate resource agencies, and will be implemented during installation to avoid impacts.
10. *Detrimentally affects air or water quality or ambient noise levels* – The project will not have a detrimental effect on air or water quality, or on ambient noise levels at the project site. Air emissions from equipment will be intermittent, localized and of very short duration, and are therefore negligible. No materials will be introduced into the water, and the native sediments will settle naturally after the cable is placed on the seabed, as occurs during natural coastal processes in the surf zone. Noise from equipment will be intermittent and of short duration during the installation activity.

11. *Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a floodplain, or coastal waters* – The project area was selected for its suitability, including the physical setting and potential environmental constraints. The suitability of the site for this project is demonstrated by the successful installation and operation, without incident, of several other cables at the landing site.
12. *Substantially affects scenic vistas and viewplanes identified in county or state plans or studies* – The project will involve the presence of vessels and equipment during a 6- to 10-day period, which will be visible to beach users but will not substantially affect the vista or viewplane upon completion of the installation. After the cable is installed, it will have no effect on vistas or viewplanes.
13. *Requires substantial energy consumption* – The project will not require substantial energy consumption, and once installed will be incorporated in the routine operation of existing infrastructure.

CHAPTER 9: FINDINGS AND REASONING SUPPORTING DETERMINATION

The installation of the Australia-Hawaii fiber optic cable system is proposed at Keawaʻula, Oʻahu, Hawaiʻi (Tax Map Keys: 8-1-01: 07), to enhance telecommunication capacity and security. The new cable will be laid within an existing easement corridor occupied by nine existing cables that connect to the existing BMH and to the AT&T cable station located approximately 1,200 feet east of Farrington Highway.

The proposed cable installation will not cause significant adverse impacts on the immediate area or vicinity of the project site. Installation will cause some short-term impacts that will not persist after installation is complete. The project site will be restored to its existing state upon completion of installation.

The proposed action will not result in loss or destruction of natural or cultural resources, will not adversely affect the social or economic welfare of the community, County or State, and will not conflict with future plans and policies of the County or State.

Based on significance criteria set forth in Hawaiʻi Administrative Rules, Title 11, Department of Health, Chapter 200, “Environmental Impact Statement Rules,” and evaluated in Chapter 8, the proposed project is not expected to have a significant impact on the environment. The recommended preliminary determination for the proposed project is a Finding of No Significant Impact (FONSI).

CHAPTER 10: REFERENCES

Atlas of Hawaii. 1998.

California Coastal Commission. 2005. Staff Report, Monterey Bay Accelerated Research System [MARS] Cabled Observatory System, E-05-007 MBARI.

California State Lands Commission. 2005. Monterey Bay Accelerated Research System [MARS] Cabled Observatory System, Environmental Impact Statement/Environmental Impact Report (EIS/EIR).

City and County of Honolulu. 2000. *Waianae Sustainable Communities Plan*. July.

Cox, E., De Carlo, E., Overfield, M. 2007. Ordnance Reef, Wai`anae, HI: Remote Sensing Survey and Sampling at Discarded Military Munitions Site. Marine Sanctuary Conservation Series NMSP-07-01. U.S. Department of Commerce, National Atmospheric and Oceanic Administration, National Sanctuary Program, Silver Spring, MD. March.

Federal Emergency Management Agency. 2005. Digital Flood Insurance Rate Map 15003C City and County of Honolulu. 2 June.

Fugro Survey Pty. Ltd. 2006. Australia–Hawaii Cable System Desktop Study. September.

Graham, Krista. 2007. Personal communication with Denise Toombs and Anna Mallon, AMEC Earth & Environmental. May and June.

Hawai‘i Department of Land and Natural Resources (DLNR), Office of Conservation and Coastal Lands. State DLNR Conservation District Subzone Maps. Transmitted to AMEC Earth and Environmental via the Internet (http://www.hawaii.gov/dlnr/occl/subzone.php), accessed June 2007.

Hawai‘i DLNR. 2004. Staff Report File No. CDUA ST-3176. Sandwich Isles Communications.

Hawai’i Administrative Rules Chapter 11-54, Water Quality Standards.

Hawaii State Department of Health (DOH). 2005. Annual Air Summary – Hawaii Air Quality Data. Transmitted to AMEC Earth and Environmental via the Internet (http://www.hawaii.gov/health/environmental/air/cab/cabmaps/pdf/2005_aqbook.pdf), accessed 9 May 2007.

Mink, John F., and L. Stephen Lau. 1990. Aquifer Identification and Classification for O`ahu: Groundwater Protection Strategy for Hawai`i. February.

Murray, James G. 2007. Personal communication with Denise Toombs, AMEC Earth & Environmental, Inc. June.

Natural Resources Conservation Service (NRCS). 1990. Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii. Prepared by Donald E. Foote, Elmer L. Hill, Sakuichi Nakamura, and Floyd Stephens.

Pacific Disaster Center. 2007. Civil Defense Tsunami Evacuation Zones for Oahu. Transmitted to AMEC Earth and Environmental via the Internet (http://www.pdc.org/iweb/tsunami_zones.jsp), accessed 10 May.

R.M. Towill Corporation. 2001. Final Environmental Assessment/Finding of No Significant Impact for the TGN Hawaii Cable System. June.

Sandwich Isles Communications. 2004. Final Environmental Assessment/Finding of No Significant Impact for a Submarine Fiber-Optic Cable Project. April.

Sherman, C.E., Fletcher, C.H., Rubin K.H. 1999. "Marine and Meteoric Diagenesis of Pleistocene Carbonates from a Nearshore Submarine Terrace, Oahu, Hawaii." Journal of Sedimentary Research, Vol. 69, No. 5, 1999, p 1083-1097.

State of Hawai'i, Office of State Planning. 1990. Hawai'i Coastal Zone Management Program. Transmitted to AMEC Earth and Environmental via the Internet (http://www.hawaii.gov/dbedt/czm/), accessed June 2007.

U.S. Census Bureau. 2000. Census 2000 Summary File. Transmitted to AMEC Earth and Environmental via the Internet (www.census.gov), accessed 10 May 2007.

Appendix A
Baseline Assessment of the Marine Environment in the Vicinity of the Australia-Hawaii System, Keawaʻula Landing, Oʻahu, Hawaiʻi

BASELINE ASSESSMENT OF THE MARINE ENVIRONMENT IN THE VICINITY OF THE AUSTRALIA-HAWAII SYSTEM, KEAWAULA LANDING, OAHU, HAWAII

Prepared for:

AMEC Earth & Environmental
9210 Sky Park Ct, Suite 200
San Diego, CA 92123

By:

Steven Dollar, Ph.D.
Marine Research Consultants, Inc.
1039 Waakaua Pl.
Honolulu, HI 96822

INTRODUCTION

Planning is underway for Alcatel-Lucent to install a fiber-optic cable for Telstra Inc. between Australia and Hawaii. The proposed Hawaii landing site is located directly offshore of the AT & T Keawaula cable station on the western shoreline of the Island of Oahu (although AT & T is not a party to the proposed action). Although there are presently numerous submerged cables in the nearshore landing corridor, it is important to have an understanding of the physical and biotic structure of the marine habitats in the area where the cable will be installed. This report presents a baseline level assessment of the physical structure and biotic community assemblages within the corridor of the cable route from the shoreline to a water depth of approximately 25 meters (m).

METHODS

All fieldwork was carried out on May 22, 2007 working from the vessel *Alyce C*. Sea conditions during the survey consisted of sunny skies, light and variable winds, with a small southerly swell resulting in surf of 1-3 feet breaking on the shoreline. The baseline assessment was conducted by S. Dollar, accompanied by B. Popp, and R. Schottle. Survey methods consisted of using a diver-propulsion device to traverse the cable route for a distance of approximately 1,000 m from the 25 m depth contour to as close to the shoreline as was possible under the prevailing conditions of surf (approximately 1.5 m water depth). The traverse followed a wire cable that was previously laid on the sea floor

to mark the exact proposed cable route. Following the route, a corridor of approximately 3 m on each side of the wire was visually inspected for biotic community composition. At locations of interest, the traverse was halted and photographs of representative features were taken. Conducting the traverse in this manner ensured that the entire cable route was viewed, eliminating the potential for missing any unique or unusual features. In addition, divers covered a zig-zag pattern over the section of elevated reef where a notch has been cut in the limestone platform to accommodate other cables (approximately 250 m from shore). During these underwater investigations, notes on species composition were recorded, and numerous digital photographs recorded the existing conditions of the area.

RESULTS

Descriptive results of the baseline assessment are divided into several zones based on physical features and water depth. Each zone is described below.

Nearshore Zone (0-150 m from shore)

Seaward of the sand beach that comprises the shoreline and intertidal area, a nearshore zone occurs where the bottom consists of a rounded rock and boulders, interspersed with patches and channels of white sand (Figure 1). The nearshore zone extends to a distance of approximately 150 m from shore in water depths of 0-2 m, Because of the shallow depth and continuous exposure to the energy of breaking waves, which results in both substantial sand scour and concussive force, biotic assemblages on the rock substrata are very limited. Occurrence of reef corals was very sparse, limited to only intermittent small nubbins of *Pocillopora meandrina*. No other motile invertebrates (e.g., sea urchins, sea cucumbers) were observed in the area. While many of upper surfaces of the boulders were covered with a short algal turf, the only abundant species of macro-benthic algae observed was *Asparagopsis taxiformis* (Figure 1). *A. taxiformis* is probably the most highly valued algae used for food by Hawaiians (Huisman et al. 2007), and is apparently well adapted (at least seasonally) to the high energy nearshore environment at Keawaula.

Reef Platform Zone (150-250 m from shore)

Seaward of the nearshore boulder zone, bottom composition consists of a sandy plain interspersed with limestone outcrops. An elevated fossil limestone reef platform occurs at a distance of between approximately 150-250 m from shore in water depths of approximately 5-8 m (Figure 2). The seaward edge of the reef platform terminates in a distinct boundary with a sand plain that extends seaward. The reef platform is by far the most biologically diverse habitat along the cable route. The predominant coral occurring on the surface of the fossil reef platform is the branching species *Pocillopora meandrina*. Throughout Hawaii, *P. meandrina* is the predominant coral in shallow, wave exposed habitats. As this species also has a "determinant" growth rate, and only reaches a certain size or age before dying, numerous non-living but recognizable skeletons of *P. meandrina* were also present on the reef surface. Other common corals on the reef were *Porites lobata* and *Leptastrea purpurea*. Corals that were observed, but are considered rare

include *Porites brighami, Porites evermanni, Monitopora patula, M. flabellata, M. capitata*, *Pocillopora eydouxi*, *Palythoa tuberculosa* and *Cyphastrea ocellina*. In total, living coral cover on the upper surface of the reef platform was on the order of 20% (Figures 2-5). Other macro-biota on the reef platform included the sea urchins *Echinothrix diadema*, *Echinometra matheai*, and *Echinostrephus aciculatus*. Several sea cucumbers (*Holothuria atra*) were also observed on the reef platform but were considered rare. Macro-algae were common, did not comprise a significant portion of cover of the reef platform. Common algae that were observed included *Asparagopsis taxiformis, Liagora spp. Halimeda spp. and Neomeris annulata.*

Of primary importance with respect to the proposed cable landing is consideration of the existing cables that cross the reef platform in the same area. Numerous cables bisect the reef platform at three primary locations. The northernmost location (the planned route for the present cable route) accommodates two cables covered with articulated armor that cross the platform either within either a shallow depression, or on the surface of the reef platform (Figure 3). While the cable lies mainly on the surface of reef platform, there are also areas where the cable is suspended as it crosses sand-filled depressions (Figure 3). At the seaward edge of the reef platform, the articulated armor covering the cable extends several meters across the sand plain (Figure 4). Beyond this distance from shore, the cables extend across the sea floor without protective armoring.

At the central location several cables cross the reef at the bottom of a deep notch that has been cut into the limestone platform (Figure 5). The southern region where cables cross the reef consists of a sand channel between sections of elevated reef platform. Several armored cables extend through this area lying either on the surface of the sand flat, or partially buried in the sand (Figure 6).

It is of interest that all of the cables observed in the Keawaula area that were situated above the elevation of the sea floor were colonized with numerous living coral colonies. The most common colonizer of the cables was *Pocillopora meandrina* and *Porites lobata*, although in deeper water, several large colonies of *Pocillopora eydouxi* were observed growing on the surface of cables (Figures 3, 4 and 7). Of interest is that no colonies of P. eydouxi of the size observed growing on the cables were observed growing on the natural reef substratum. In addition, the cables that traversed the reef in the central location within the deep cut notch contained far fewer attached corals than the cables that laid on the surface of the reef platform (compare coral growth on the cables in Figures 3 and 5). In some areas, cables that were not buried in the sand, and were elevated off the bottom also harbored some algal growth (Figure 4). From these observations it can be concluded that there is no long-term detrimental effect of the cables to reef biotic community structure. In fact, when elevated off the reef platform, cables provide a more suitable habitat for settlement and growth of coral, likely owing to lower sand scour.

Deep Reef Flat Zone

From the seaward edge of the reef platform (250 m from shore) to approximate 900 m from shore bottom composition consisted of predominantly flat, gently sloping limestone surface covered with a thin veneer of sand (Figure 8). Predominant biota on the deep reef

flat were the branching corals *Pocillopora meandrina* and *P. eydouxi*, as well as small mound-shaped colonies of *Porites lobata*, and flat encrustations of *Montipora spp*. and *Leptastrea purpurea*. Also present on the surface of the deep reef flat were the green conical-shaped sponges *Spirastrella vagabunda,* as well as the sea *Echinothrix diadema*. At a depth of approximately 11 m an area of broken reef plate, rubble and sand deposits was encountered which created considerably more vertical relief than the surrounding reef flat (Figure 8). Numerous cables crossed the surface of the deep reef flat, and were colonized by abundant corals, as described above.

At a depth of approximately 18 m, at a distance of 900 m from shore, a notch created by a previous stand of sea-level provided another area of vertical relief on the deep reef flat (Figure 8). Corals were slightly more abundant on the top of the notch, but the species assemblages did not differ from those found on the flats. Numerous cables were observed crossing over the notch.

Seaward of the notch, to the depth limits of the survey (25 m), bottom composition was similar to the shallower deep reef flat zone. However, with increasing depth, coral abundance decreased on the flat bottom.

Summary and Conclusions

A baseline qualitative assessment of the marine habitats along the route of the proposed Australia-Hawaii cable landing at Keawaula, Oahu provides an overview of the biotic communities in the area, as well as the data to assess the potential effects of the cable to the marine environment. In summary, the physical and biotic structure of the entire area is determined primarily by the high level of wave action that routinely impacts the western coast of Oahu during the winter months. The offshore area between the depths of 8 - 25 m and 250 - 1000 m from shore consist of a relatively flat limestone platform covered with a veneer of sand. Biotic colonization of the flat is sparse consisting primarily of heads of *Pocillopora meandrina*.

The most prominent feature of the cable route is an elevated fossil reef bench at a depth of approximately 7 m, 200-250 m from shore. Biotic colonization of the reef platform is the highest of any zone surveyed, consisting primarily of a variety of wave-resistant corals and algae. Numerous cables cross the reef platform, and where the cables are elevated over the reef surface or sand, they are among the locations with highest coral colonization. Where the cables cross sand flats, they are partially or completely buried, again providing conditions that could not be considered detrimental to biotic community structure. As a result, it can be concluded that placement of a new cable should not pose any negative effect to the marine habitats off of Keawaula.

References Cited:

Huisman, J.M., I. A. Abbott, and C. M. Smith. 2007. Hawaiian Reef Plants. Report No. UNIHI-SEAGRANT-BA-03-02. University of Hawaii Sea Grant College Program.

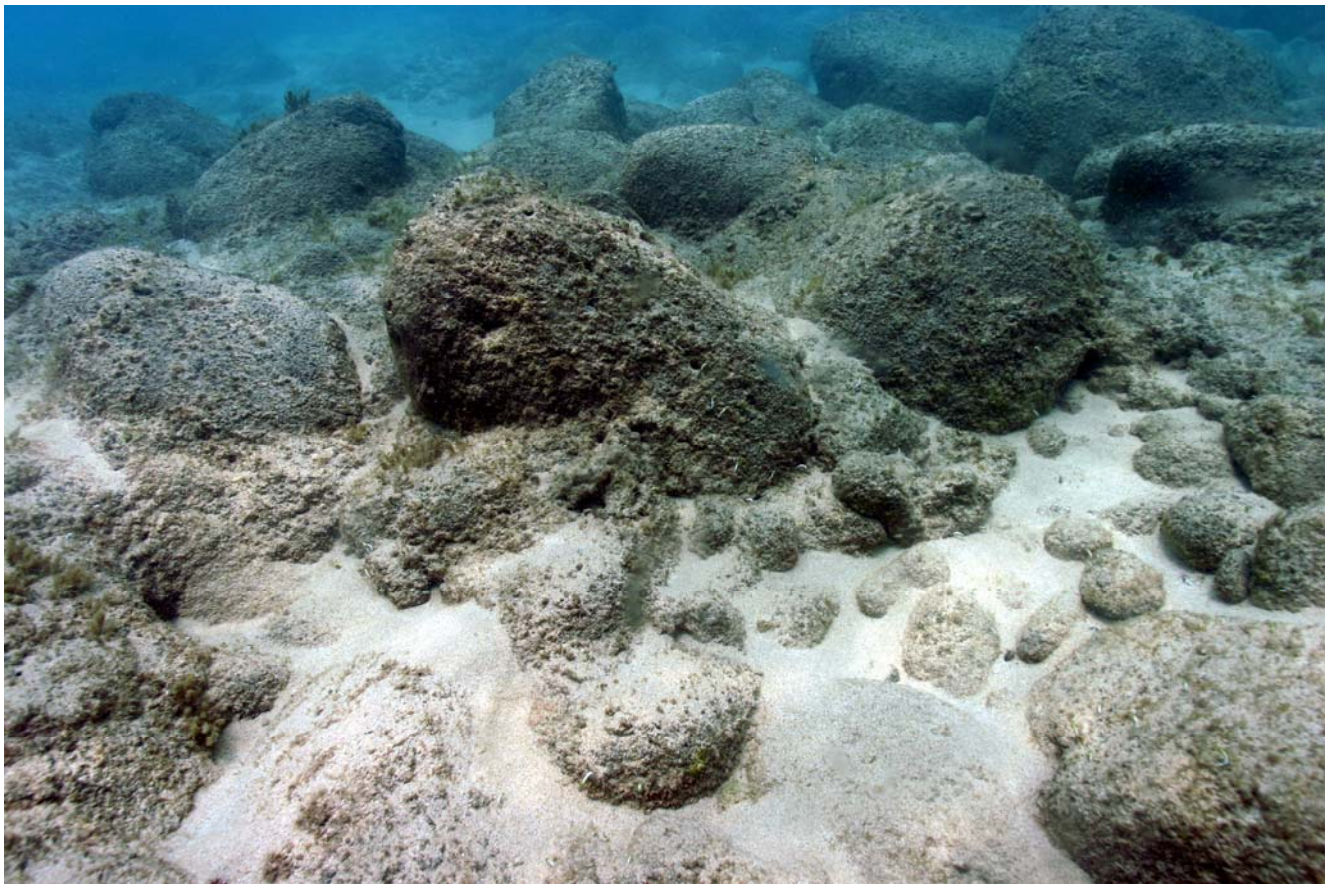


FIGURE 1. Rounded boulders and sand-covered bottom in nearshore zone (~50 m from shore) at Keawaula, Oahu on the proposed route of the Australia-Hawaii cable. The abundant algae on the center rock in upper photo is *Asparagopsis taxiformis*. Water depth is approximately 1.5 m.

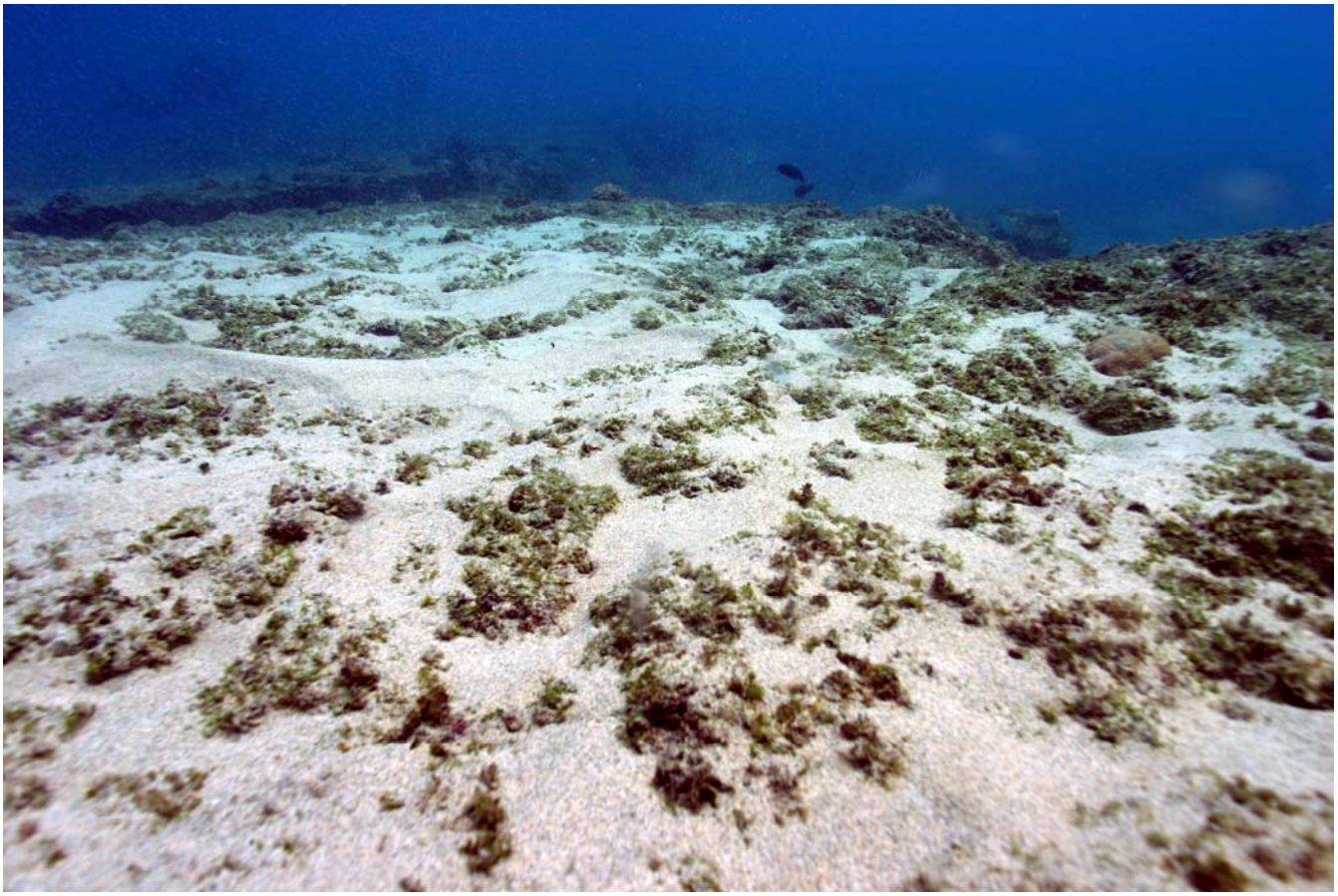


FIGURE 2. Two views of the reef surface in the vicinity of the elevated reef platform near the route of the Australia-Hawaii cable landing. Upper photo shows portion of route over the top of the reef platform. Bottom photo shows area to the north of proposed route where reef surface is predominantly sand. Wire tracing proposed route is visible at lower right of upper photo. Water depth is approximately 7 m.

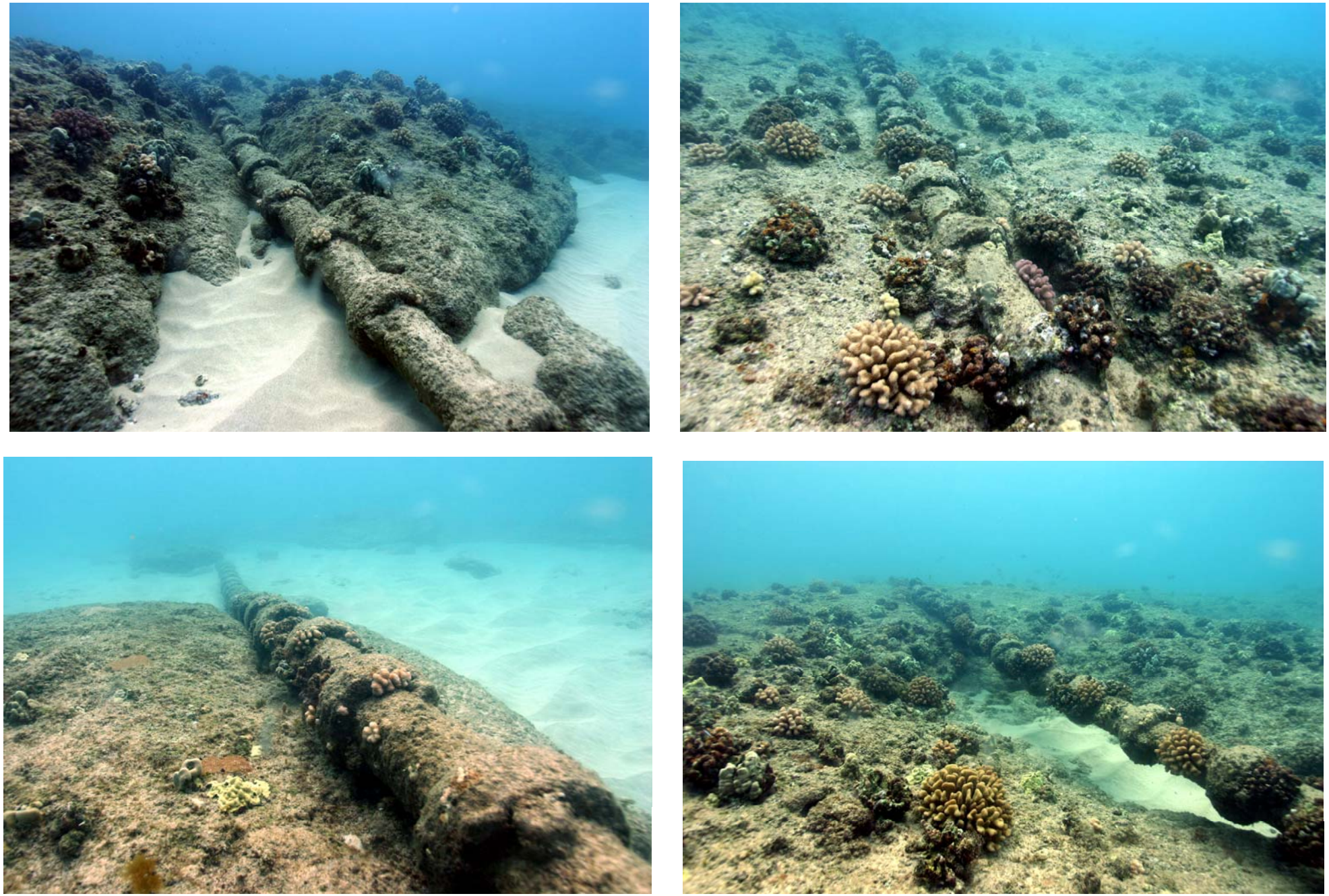


FIGURE 3. Four views of armored cables crossing elevated reef flat at Keawaula, Oahu. The area where these cables cross the reef is the proposed route for the Australia-Hawaii cable landing. Note the high settlement of coral on all of the cables that are elevated above the reef surface. The most common coral on the cables is the hemispherical branching species *Pocillopora meandrina*. Water depth is approximately 7 m in all photos.

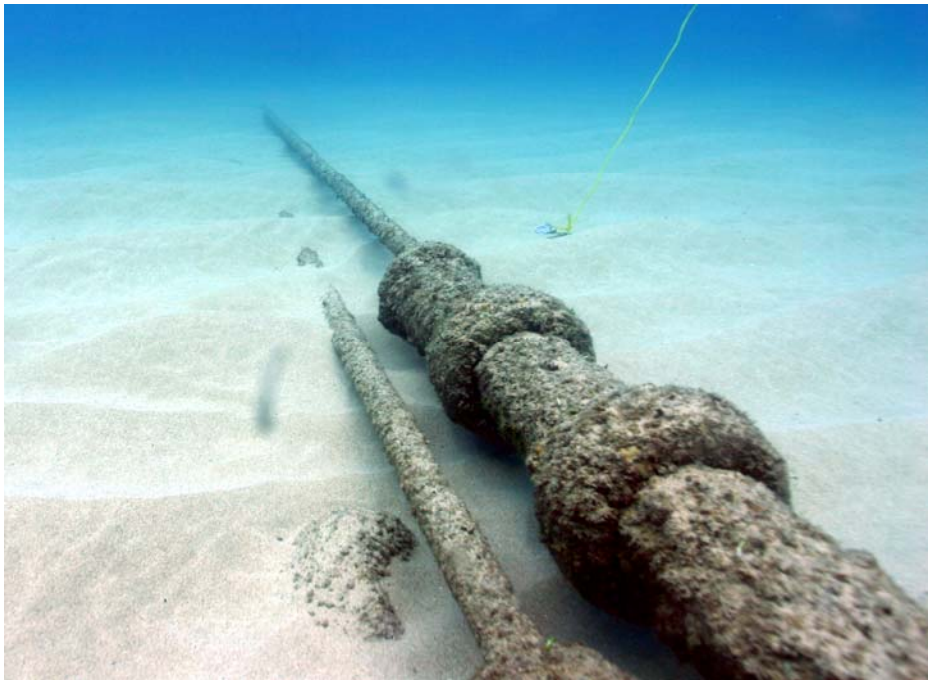


FIGURE 4. Three views of existing cables in the vicinity of the proposed Australia-Hawaii cable landing at Keawaula, Oahu. Photo at upper right shows the termination of armor on cable as it enters the sand at location of proposed cable route (marked by weight and yellow line). Cables shown in photos at upper and lower left that are elevated above the sand surface are densely covered with a variety of corals and algae. Water depth in all photos is ~8 m.

FIGURE 5. Four views of cables bisecting the reef platform through a notch cut into the reef located several meters to the south of the proposed route of the Australia-Hawaii cable. Note very low incidence of coral colonization of cables below the level of the reef platform. Water depth is approximately 8 m.

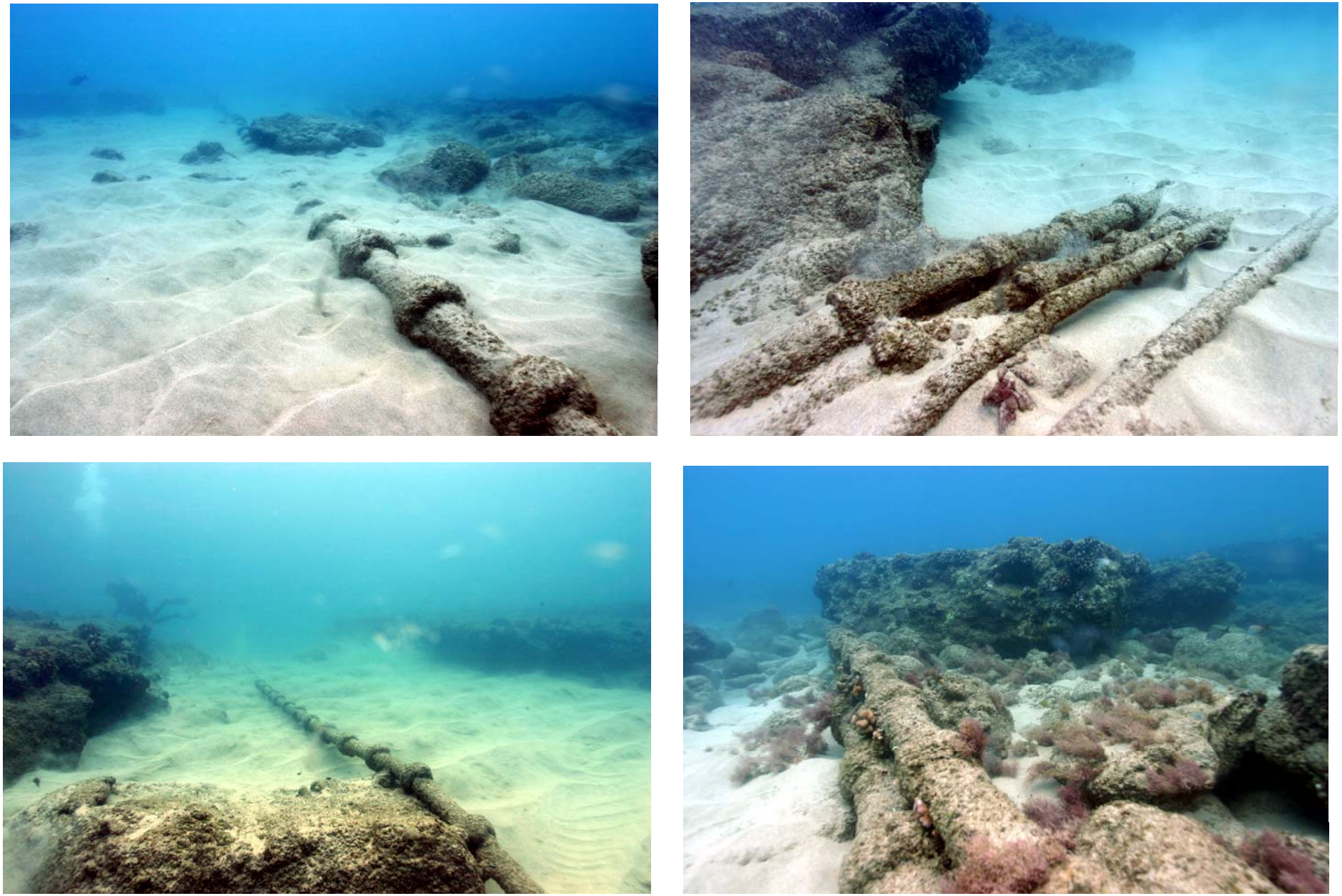


FIGURE 6. Various cables crossing through a sand gap in the reef platform at Keawaula, Oahu, south of the location of the proposed Australian-Hawaii cable landing. Red algae growing on cable and rocks in photo at lower right is *Liagora* sp. Water depth is ~7 m.

FIGURE 7. Large colonies of the branching coral *Pocillopora eydouxi* growing on cables in the vicinity of the Australia-Hawaii cable route at Keawaula, Oahu. No colonies of this species of this size were observed in the area growing on natural substratum. Water depth in both photos is ~11-12 m. Yellow fish in lower photo are *Chaetodon miliaris*; black and white fish clustered over the coral heads are *Dascyllus albisella*.

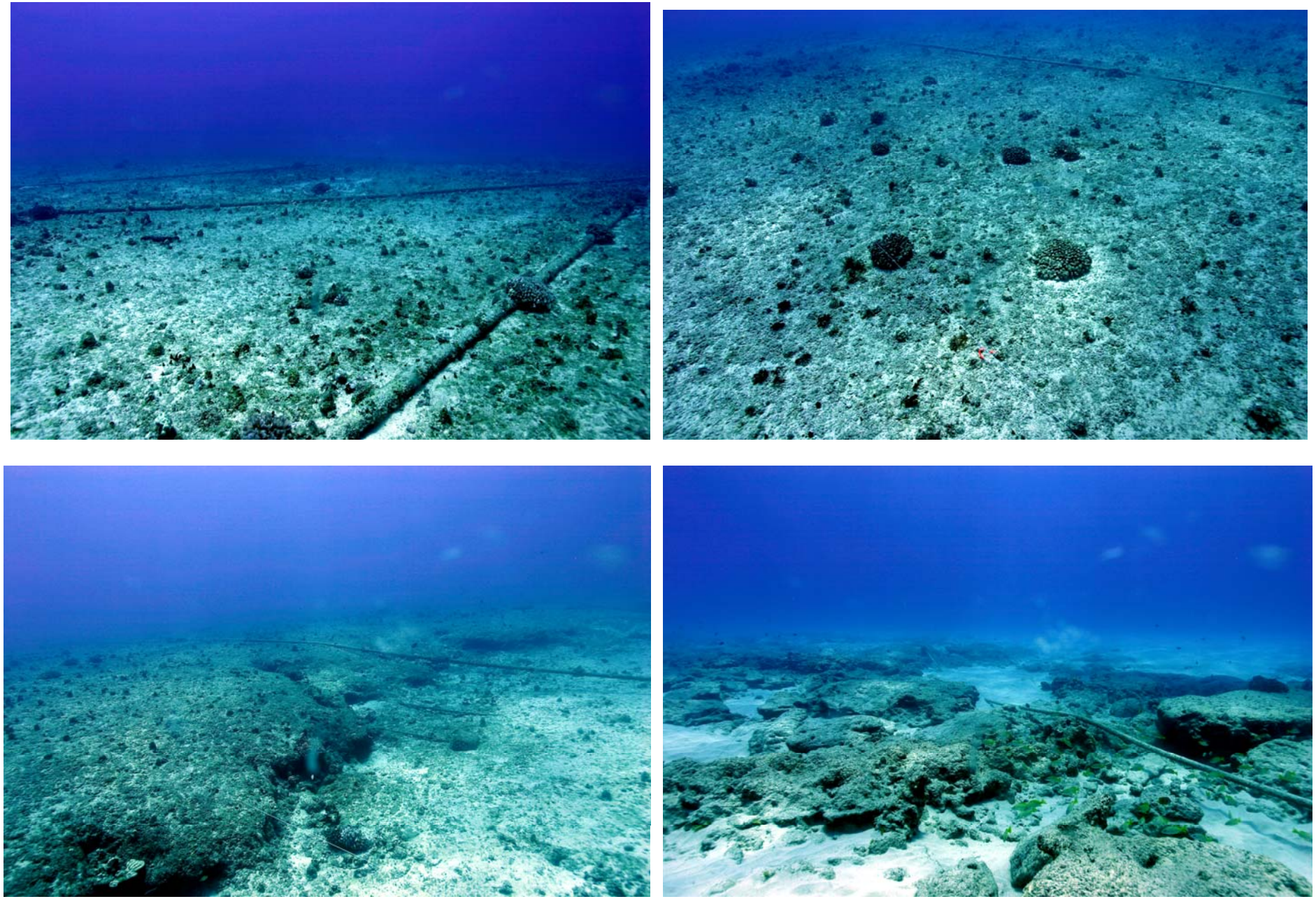


FIGURE 8. Four views of the deep reef flat at Keawaula, Oahu on the proposed route of the Australia-Hawaii cable. Upper two photos show areas of the reef flat that occurs between approximately 250 and 900 m from shore. Large hemispherical coral colonies in both photos is *Pocillopora meandrina*. Photo at lower right shows section of reef where the limestone platform is broken up (water depth 11 m); photo at bottom left shows fossil shoreline notch at a depth of 18 m. Numerous existing cables can be seen in all photos. Wire marking proposed route of Australia-Hawaii cable can be seen in photos at upper right and lower left.

Appendix B
Archaeological Assessment

GARCIA AND ASSOCIATES
146 HEKILI STREET, SUITE 101, KAILUA, HI 96734 PHONE 808.262.1387 FAX 808.262.1384

21 June 2007

Denise Toombs
Senior Program Manager
AMEC Earth & Environmental Inc.
703 Market Street, Suite 1511
San Francisco, CA 94103

RE: ARCHAEOLOGICAL ASSESSMENT OF FIBER OPTIC CABLE CORRIDOR, KEAWA'ULA BEACH, KA'ENA POINT STATE PARK, WAI'ANAE DISTRICT, O'AHU (TMK 8-1-001:008).

Aloha Denise,

At the request of AMEC Earth & Environmental, Inc., Garcia and Associates has completed archaeological assessment of areas associated with proposed fiber optic cable installation at Keawa'ula Beach, Ka'ena Point State Park, Wai'anae District, O'ahu (Figure 1). Archaeological assessment included:

1. Subsurface excavation along the fiber optic cable corridor,
2. Surface survey of a 10 x 10 m area surrounding a conduit manhole, and
3. Surface survey of a proposed equipment staging area.

Archaeological fieldwork was conducted by Dana Gaskell and Amanda Sims, under the supervision of Michael Desilets, MA, on June 18 and 19, 2007. Work on June 18 was performed under a special use permit obtained from the Department of Land and Natural Resources (DLNR) Division of State Parks. This permit covered all work in the area extending from the park access road to the beachline as well as the conduit manhole and equipment staging areas. A separate Right-of-Entry was obtained from the DLNR Land Division for the portion of the cable corridor running through unencumbered state lands (from the beachline to the waterline). This area was investigated on June 19.

Project Area Description

The project area is located within a coastal parcel (TMK 8-1-001:008) in Wai'anae District, Island of O'ahu (Figure1). The parcel encompasses both Ka'ena Point State Park and a narrow strip of unencumbered state land running along the immediate shoreline. The main study area is a 75 m by 20 m corridor running from the waterline at Keawa'ula Beach, also known as Yokohama Beach, to an existing buried conduit at the state park access road. Terrain consists of wave-deposited beach sand grading upslope to an artificial, level grassy shelf. The original landscape likely consisted entirely of aeolian beach dunes.

The study area begins at the State Park access road and extends fifty meters seaward (Figure 2). The endpoint of the study area is approximately 15 meters from the water line. Due to the massive seasonal migration of sand along this beach, it was considered unnecessary to investigate shoreline deposits that were clearly recent.

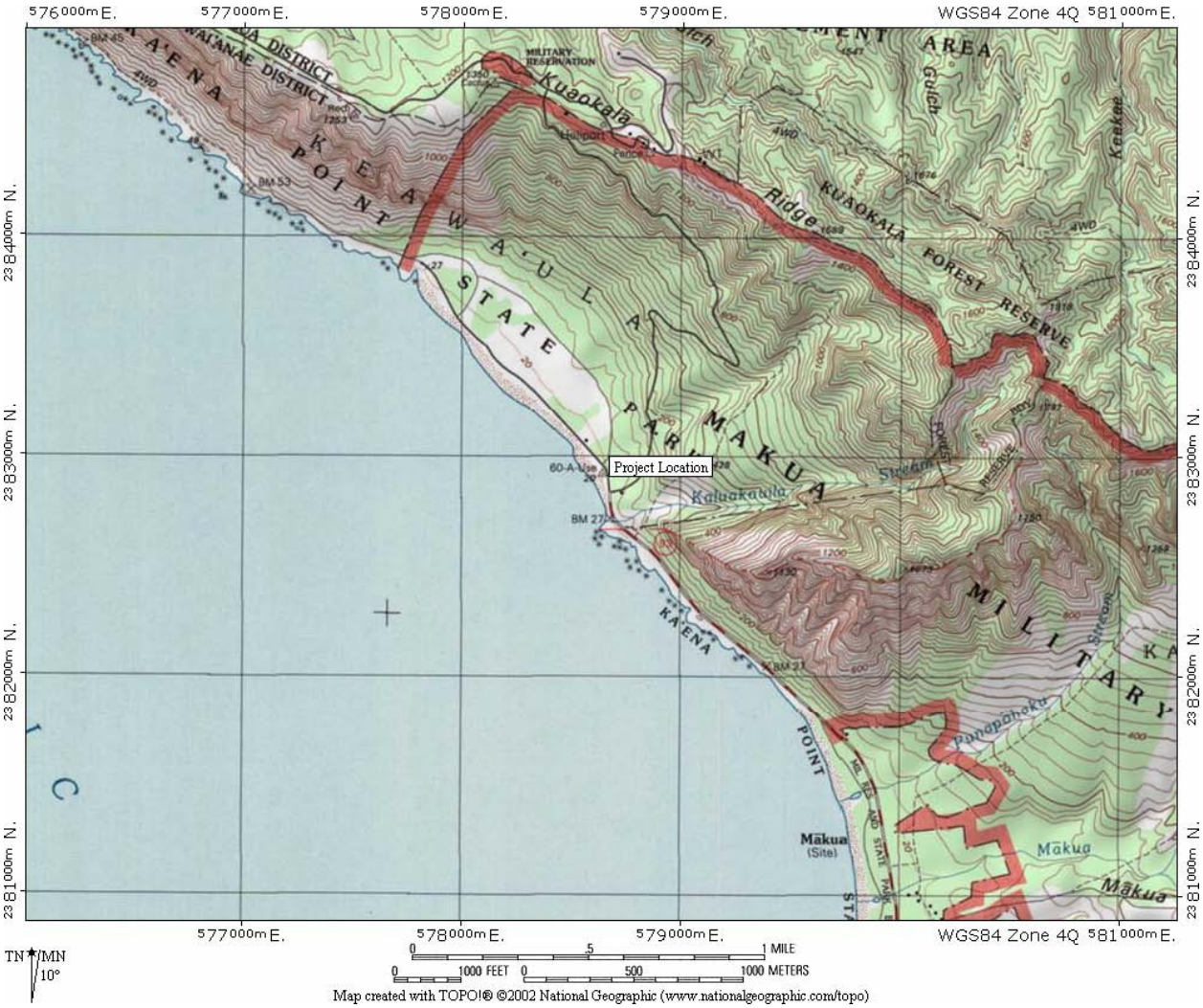


Figure 1. Project area, Keawaʻula Beach, Kaʻena Point State Park, Waiʻanae District, Oʻahu.

Research conducted at the State Historic Preservation Division and at DLNR State Parks indicated that no previous archaeological investigation had been conducted in the cable corridor. There are, however, two documented archaeological sites in close proximity to the project area (Figure 2). State Site 50-80-03-2805, a complex of 37 historic and prehistoric surface features, encompasses most of the coastal plain northeast of Kaʻena Point access road (Yent and Estioko-Griffen 1977; Yent and Estioko-Griffen 1978; Yent 1991). Twenty nine of the features are associated with early 1900s railroad, ranching, and general waste dumping. Eight features appear to be traditional Hawaiian including one possible *heiau*. These features are located well to the northeast of the project area.

State Site 50-80-03-2802 is a traditional Hawaiian cultural deposit located 40 m southwest of the U.S. Air Force guard station and 4 m southwest of the Kaʻena Point State Park entrance. This site was excavated by State Parks archaeologists in 1979 (Estiko-Griffin and Lovelace 1980). They recorded 28 subsurface features in the coastal sand deposits and recovered a variety of artifacts including volcanic glass flakes, basalt adze fragments, coral and urchin spine abraders, fishhooks, and an ʻ*ulu maika*, among others. Prehistoric utilization of the site was apparently focused on exploitation of coastal and marine resources. Overlying historic-era deposition included crushed coral fill, probably related to the former Oahu Railway

Figure 2. Project area location and nearby archaeological sites.

and Land Company railroad line, and two garbage pits. Site 50-80-03-2802 terminates at a wave-cut bank and extends some 20 m along the coast.

Fiber Optic Corridor Results

Ten shovel test units were placed at 10 m intervals along two transects, each offset 5 m from the approximate corridor centerline (Figure 2). Shovel tests had a target depth of 1 m below ground surface. All excavated material was sieved through ¼ inch mesh screen.

Stratigraphic profiles were recorded for all ten shovel test units (Table 1). Six units located on the beach portion were excavated to 1 m below ground surface (Figure 3). These units consisted of unconsolidated calcareous sand and yielded no evidence of cultural deposition (Figure 4). Local informants confirmed that much of this sand washes out to sea seasonally. With such active beach migration, it is unlikely that cultural resources are present at any depth within the beach portion of the corridor.

The remaining 4 test units in the grassy area above the beach produced a compact, rocky fill layer that in many cases proved to be too difficult to excavate by hand (Figure 5). The rocky fill layer included small to medium sized cobbles and historic coral fill. This fill layer may have been imported when the access road was being built. Due to the compactness of the fill layer the targeted excavation depth was not

Table 1. Stratigraphic Profiles for Shovel Test Units

Shovel Test	Layer	Depth (cmbs)	Description
1	I	0–40	10YR 3/2 (brown) compact sandy silt; terrigenous with small calcareous fraction; fine roots; charred wood; A-horizon; imported fill.
	II	40–65	10YR 7/4 (pale brown) unconsolidated calcareous sand; wave-deposited sediment.
2	I	0–15	10YR 3/2 (brown) compact sandy silt; terrigenous with small calcareous fraction; fine roots; charred wood; A-horizon; imported fill.
	II	15–30	10YR 7/4 (pale brown) compact rocky silt; terrigenous with small calcareous fraction; A-horizon; imported fill.
3	I	0–4	10YR 7/4 (pale brown) unconsolidated calcareous sand; wave-deposited sediment.
	II	4–10	10YR 3/2 (brown) compact sandy silt; terrigenous with small calcareous fraction; fine roots; charred wood; A-horizon; imported fill.
	III	10–50	10YR 3/2 (dark brown) compact silty clay, with small calcareous fraction; angular structure.
4	I	0–25	10YR 7/4 (pale brown) unconsolidated calcareous sand; charred wood; wave-deposited sediment.
	II	25–40	10YR 3/2 (brown) compact sandy silt; terrigenous with small calcareous fraction; fine roots; A-horizon; imported fill.
5–6	I	0–100	10YR 7/6 (pale brown) unconsolidated calcareous sand; surface vegetation; limited fine roots; charred wood; wave-deposited sediment.
7–10	I	0–100	10YR 7/6 (pale brown) unconsolidated calcareous sand; wave-deposited sediment.

Figure 3. Project area with red pin-flags marking the corridor centerline. View to northeast.

Figure 4. Test Unit 8 on beach portion of corridor.

Figure 5. Test Unit 3 on grassy northeastern portion of corridor.

achieved. The average depth for these units was 46 cm below ground surface. Historic trash (e.g. modern glass, fishing line, paper trash) and charred wood were observed throughout these test units. As with the beach deposits, intact cultural resources are unlikely in or below this layer.

Conduit Manhole and Proposed Equipment Staging Area Results

A 10 m^2 area surrounding the conduit manhole cover and the entire proposed equipment staging location northeast of the access road were assessed for historical properties. The manhole area is surrounded by non-native grasses and lined by a rock push pile on one side. The equipment staging area is currently a dirt and gravel-paved parking area. Surface survey of both these areas yielded no evidence of historical properties.

Conclusions and Recommendations

Archaeological assessment of the fiber optic cable corridor, conduit manhole area, and proposed equipment staging area at Keawa‘ula Beach resulted in negative findings for cultural resources.

Excavation of six shovel test units in unconsolidated calcareous sand yielded no evidence of cultural deposition. Four units dug in the grassy area above the beach yielded primarily fill sediments containing modern trash. Due to the compact rocky fill layer in this area, the target excavation depth (1 m) was not met for all test units.

Given that this corridor has been previously excavated for cable installation, it is expected that underlying sand deposits have an extremely low probability for containing intact cultural resources. However, due to 1) the presence of cultural resource sites in the general area, 2) the projected two meter excavation depth for cable installation, and 3) the heightened sensitivity to cultural resource concerns in the local community, it is recommended that a qualified archaeological monitor be present during excavation activities in the cable corridor.

If you have any questions about the information contained in this letter, please contact me at the Garcia and Associates office (261-9297) or by cell (227-6655).

Mahalo,

Michael Desilets
Pacific Regional Manager
Garcia and Associates

References

Estioko-Griffen, Agnes and George W. Lovelace.

1980 *Patterns of Coastal Adaptation in the Ahupua‘a of Keawa‘ula. The Archaeology of Site 50-80-03-2802.* Prepared for The Department of Land and Natural Resources, Division of State Parks, Outdoor Recreation and Historic Sites.

Yent, Martha

1991 *Archaeological Inventory Survey: Keawaula, Kaena State Park, Waianae, Oahu. State Site No. 50-80-03-2805.* Prepared for the Division of State Parks Department of Land and Natural Resources.

Yent, Martha, and Agnes Estioko-Griffen

1977 Results of Archaeological Survey in the Areas Adjacent to the Kaena Point Road at Keawaula. Memorandum, Department of Land and Natural Resources, Division of State Parks. November 21, 1977.

1978 Results of Archaeological Survey in the Areas Adjacent to the Kaena Point Road at Keawaula. Memorandum, Department of Land and Natural Resources, Division of State Parks. February 10, 1978.

Appendix C
Marine Protected Species Protection Protocols

MARINE PROTECTED SPECIES PROTECTION PROTOCOLS

Australia-Hawaii Fiber Optic Cable Landing

The following guidelines are to be followed by the crew of the cable ship and support boat(s) during the 2008 installation of the Australia-Hawaii cable landing at Keawa`ula. These guidelines are intended to establish awareness of the potential for contact with marine protected species (marine mammals and turtles), and actions for avoiding contact during the installation. In addition, procedures for reporting incidents involving marine mammals are described below.

These guidelines are based on protocols used by observers during cable installations and inspection surveys conducted in California.[1]

These guidelines are to be carried out to the extent feasible by the ship's personnel and onboard representative, giving first priority to the safety of the vessel and crew.

- A look-out for marine mammals and turtles shall be included with the normal look-out duties of the vessel's bridge personnel, provided this does not interfere with the safe operation of the vessel.
- Maintain a log of sightings, noting date, time, coordinates, and approximate distance of the animal from the ship. The log shall be turned in daily.
- If contact with a marine mammal appears likely, the vessel speed should be reduced as soon as possible.
- If a mammal approaches the cable lay operation, slack should be taken out of the cable to reduce the amount of cable in the water column. If it is safe to do so, the ship should be allowed to drift.
- In the unlikely event of contact between a marine mammal and the vessel, the following actions should be taken (if it is safe to do so):
    - Contact the onboard Alcatel-Lucent representative immediately;
    - Log all information related to the incident (see attached log) and prepare to report the incident to the Marine Mammal Response Network, and NOAA Marine Mammal Response Network Coordinator, Protected Resources Division. Contact with marine mammals **MUST BE REPORTED** in any circumstance.
    - Await instructions from either the Marine Mammal Response Network or the Alcatel-Lucent representative.
- Record all information related to the incident, with photographs if applicable, and submit with the daily report to the onboard representative.

IN CASE OF MARINE MAMMAL CONTACT WITH A PROJECT VESSEL

CONTACT MARINE MAMMAL RESPONSE NETWORK

1-888-256-9840

---

[1] The protocols were originally developed by the Marine Mammal Consulting Group in Santa Barbara, California, and approved by state and federal agencies with authority for overseeing the activity.

MARINE PROTECTED SPECIES DAILY REPORTING LOG

DATE	TIME	LOCATION	OBSERVATION

Contact Information:

David Schofield
Marine Mammal Response Network Coordinator
Protected Resources Division
NOAA
PHONE: 888.256.9840
EMAIL: david.schofield@noaa.gov

Other Contacts:

Sea Turtle Strandings 808-983-5730
Monk Seal Sightings 808-220-7802

Appendix D
Comment Letters and Responses

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF:OCCL:TM

CDUA: OA-3435
Acceptance Date: September 11, 2007
180-Day Exp. Date: March 9, 2008

OCT 26 2007

Denise Toombs
AMEC Earth and Environmental
703 Market Street, Suite 1511
San Francisco, CA 94103

Dear Ms. Toombs,

SUBJECT: Conservation District Use Application (CDUA) OA-3435 for the Telstra Inc. Proposed Australia-Hawaii Fiber Optic Cable System Located at Keawaula, Waianae, Island of Oahu, submerged lands off of and a portion of TMK: (1) 8-1-001:008

This letter is regarding the processing of CDUA OA-3435. The public and agency comment period on your client's application has closed (October 23, 2007). Attached to this letter are copies of the comments received by the Office of Conservation and Coastal Lands (OCCL) regarding the CDUA. Please send copies of your responses to the questions raised in these letters directly to the authoring agency as well as to the OCCL.

Early submittal of your response to comments will expedite the review process. Should you have any questions, please contact Tiger Mills of our Office of Conservation and Coastal Lands at 587-0382.

Sincerely,

Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

LINDA LINGLE
GOVERNOR OF HAWAII

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. Box 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
EPO-07-195

2007 OCT 26 P 12: 24

October 23, 2007

Mr. Samuel J. Lemmo, Administrator
State of Hawaii
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Lemmo:

SUBJECT: CDUA OA-3435
Draft Environmental Assessment and Conservation District Use Application for the Australia-Hawaii Fiber Optic Cable System
Keawaula, Waianae, Oahu, Hawaii
TMK: (1) 8-1-001: 008

Thank you for allowing us to review and comment on the subject application. The document was routed to the various branches of the Department of Health (DOH) Environmental Health Administration. We have the following Clean Water Branch and General comments.

Clean Water Branch

Please note that our review is based solely on the information provided in the subject document and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf.

1. Any project and its potential impacts to State waters must meet the following criteria:

    a. Anti-degradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.

    b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.

    c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

2. Please call the Army Corps of Engineers at (808) 438-9258 to see if this project requires a Department of the Army (DA) permit. Permits may be required for work performed in, over, and under navigable waters of the United States. Projects requiring a DA permit also require a Section 401 Water Quality Certification (WQC) from our office.

3. You are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for NPDES general permit coverage by submitting a Notice of Intent (NOI) form:

   a. Storm water associated with construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. **An NPDES permit is required before the start of the construction activities.**

   b. Construction dewatering effluent.

   You must submit a separate NOI form for each type of discharge at least 30 days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI must be submitted 30 days before to the start of construction activities. The NOI forms may be picked up at our office or downloaded from our website at: http://www.hawaii.gov/health/environmental/water/cleanwater/forms/genl-index.html.

4. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the State's Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of $25,000 per day per violation.

If you have any questions, please visit our website at http://www.hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at 586-4309.

General

We strongly recommend that you review all of the Standard Comments on our website: www.state.hi.us/health/environmental/env-planning/landuse/landuse.html. Any comments specifically applicable to this project should be adhered to.

If there are any questions about these comments please contact Jiacai Liu with the Environmental Planning Office at 586-4346.

Sincerely,

for

KELVIN H. SUNADA, MANAGER
Environmental Planning Office

c: EPO
CWB

November 21, 2007

Kelvin H. Sunada, Manager
Environmental Planning Office
State of Hawai‘i Department of Health
PO Box 3378
Honolulu, HI 96801-3378

Re: Conservation District Use Application (CDUA OA-3435) and Draft Environmental Assessment (EA) for Australia-Hawaii Fiber Optic Cable System
Keawa‘ula, Wai‘anae, O‘ahu, Hawai‘i
TMK: (1) 8-1-001: 008 and Submerged Lands

Dear Mr. Sunada:

Thank you for your letter dated October 23, 2007, containing comments from the Clean Water Branch and General comments. On behalf of Telstra, Inc., we appreciate the opportunity to work with the Department of Health through the approval and permitting process for the Australia-Hawai‘i Fiber Optic Cable Project.

In response to your letter, this project will be installed and operated in compliance with all applicable laws and regulations, including the State’s Water Quality Standards (Hawaii Administrative Rules Section 11-54) and permitting requirements (HAR Section 11-55). In addition to the CDUA:

- A Department Army (DA) permit is in progress: US Army Corps of Engineers File # POH-2007-157;

- A National Pollutant Discharge Elimination System (NPDES) permit is not required as the project will generate no wastewater discharge or storm water run-off into State surface waters and the area to be excavated and equipment operations and staging areas will be fully contained in less than one acre of total land area; and

- A Section 401 Water Quality Certification application will be submitted to the Clean Water Branch this month.

If you have any additional comments or concerns, please feel free to contact me at 415.261.6693 or Anna Mallon in our Honolulu Office at 808.545.2462.

AMEC Earth & Environmental, Inc.
703 Market Street, Suite 1511
San Francisco, CA
USA 94103
Tel +1 415.261.6693
Fax +1 415.644.0883 www.amec.com

Best regards,

Denise M. Toombs
Senior Program Manager
Direct Tel.: 415.261.6693
Direct Fax: 415.644.0883
E-mail: denise.toombs@amec.com

c: Tiger Mills, DLNR Office of Conservation and Coastal Land
Ed Chen, Clean Water Branch
Joanna Seto, Clean Water Branch
Anna Mallon, AMEC
Roy Carryer, Alcatel-Lucent

68064

WAIANAE NEIGHBORHOOD BOARD NO. 24

c/o NEIGHBORHOOD COMMISSION • 530 SOUTH KING STREET ROOM 400 • HONOLULU, HAWAII, 96813
PHONE (808) 527-5749 • FAX (808) 527-5760 • INTERNET: http://www.honolulu.gov

RECEIVED
LAND DIVISION
2007 OCT 25 A 10: 22
2007 OCT 25 P 3: 45
07 OCT 22 A9:43
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

October 19, 2007

Laura Thielen, Chairperson
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
P.O Box 621
Honolulu, Hawaii 96809

RE: FIBER OPTIC CABLES AT KEAWA'ULA (YOKOHAMA), AT&T AND TELSTRA DRAFT ENVIRONMENTAL ASSESSMENTS, TMK 8-1-001: PARECEL 8

Dear Ms. Thielen:

Thank you for this opportunity to comment.

The Wai'anae Neighborhood Board's Planning, Zoning, Housing and Law Enforcement Committee has held two public meetings regarding this project. This project was presented to the Committee on August 8, 2007 by Chester Koga for AT&T and on September 10, 2007 by Chester Koga and Denise Toomes for Telstra.

During these meetings, there have been requests by those in attendance for some type of benefits package to the community, specifically scholarships for Wai'anae and Nanakuli High School students. AT&T is seeking approval from their Board of Directors for the scholarships and for park improvements. The proposed scholarships would each be for $5000, for a student at each high school, and would be given annually for the length of time that AT&T uses these cables.

Telstra has not been able to make such a commitment now but is considering what they can give to the community in the way of something such as park improvements.

The other request that arose during the PZH&LE committee meetings was a request for a continued commitment to ensure that respect would be paid to cultural issues, beliefs and findings. Telstra has said that an archeologist will be on site during the work. Telstra's draft Environmental Assessment does state that regarding archeological and historical resources, one of the mitigation methods will be that "A qualified archaeological monitor will be present during excavation activities in the cable corridor; and if potentially significant resources are uncovered during excavation or trenching activities, all excavation or trenching activity shall halt until the nature and significance of the resources can be determined by the on-site archaeologist."

AT&T added that is it doubtful that any cultural or historical findings would be in the project area as most of the cultural and historical findings are on the mauka side of Farrington Highway and this work is being done on the makai side of Farmington. AT&T added that the trench to be used is a trench that has been opened before and neither iwi, nor any other cultural or historical items have been previously found in the trench.

The Committee's recommendation that the Wai'anae Neighbor Board support this project is contingent upon AT&T and Telstra fulfilling their above-referenced commitments to the Wai'anae community. This recommendation came via a motion in the PZH&LE Committee and the vote was 6 yes (in support of the motion to make this recommendation), 0 no and 1 abstention. The Wai'anae Neighborhood Board reserves their final opinion for the results of the October 23, 2007 public hearing.

Sincerely,

Patty Kahanamoku Teruya

Patty Kahanamoku Teruya
Wai'anae Neighborhood Board
Chairperson

Denise M. Saylors

Denise M. Saylors
Planning, Zoning, Housing, Law Enforcement
Committee Chairperson

November 21, 2007

Ms. Patty Kahanamoku Teruya, Chairperson
Waiʻanae Neighborhood Board No. 24
c/o Neighborhood Commission
530 S. King St., Room. 400
Honolulu, HI 96813

Re: Conservation District Use Application (CDUA OA-3435) and Draft Environmental Assessment (EA) for Australia-Hawaii Fiber Optic Cable System
Keawaʻula, Waiʻanae, Oʻahu, Hawaiʻi
TMK: (1) 8-1-001: 008 and Submerged Lands

Dear Ms. Teruya:

Thank you for your interest in the Australia-Hawaii Fiber Optic Cable Project. On behalf of Telstra, Inc., we acknowledge your comments provided in a letter to DLNR dated October 19, 2007, and appreciate the opportunity to continue to work with the Waiʻanae Neighborhood Board.

Best management practices will be used throughout the construction and installation phase, and precautions will be taken to minimize the disturbance to the natural environment, and public use of the beach. An archaeologist will be onsite during all ground disturbing work, and in the event cultural objects are discovered, work will cease until the nature of the resource can be assessed.

We will continue our conversations with the Waiʻanae Neighborhood Planning Committee regarding providing assistance with beach or park improvements in the project area.

If you have any additional comments or concerns, please feel free to contact me at 415.261.6693 or Anna Mallon in our Honolulu Office at 808.545.2462.

Very Respectfully,

Denise M Toombs

Denise M. Toombs
Senior Program Manager

c: Tiger Mills, DLNR Office of Conservation and Coastal Land
Denise Saylors, Waianae Neighborhood Board
Anna Mallon, AMEC
Roy Carryer, Alcatel-Lucent

AMEC Earth & Environmental, Inc.
703 Market Street, Suite 1511
San Francisco, CA
USA 94103
Tel +1 415.261.6693
Fax +1 415.644.0883 www.amec.com

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
2007 OCT -8 A 9: 11
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII
OFFICE OF CONSERVATION AND COASTAL LANDS

October 5, 2007

MEMORANDUM

To: Sam Lemmo, Administrator
Office of Conservation and Coastal Lands

From: Daniel S. Quinn, Administrator

Subject: OA-3440 for the Proposed Fiber Optic Cable Installation by AT&T

We reviewed the subject matter and note that both this project and OA-3435 for the proposed Australia – Hawai'i Fiber Optic Cable by Telstra have an anticipated schedule that begins in April 2008. The coordination of activities for both projects will minimize disruption to park users at Yokohama Beach.

We have no objections to this project and the one proposed by Telstra for the following reasons:

> The project already serves as a cable landing site for existing international submarine cables.
>
> Telstra did some archaeological excavation in the area where their cables will be installed and found no archaeological deposits to indicate there are possible sites within the easement area.

We do however, request that Eric Kato, O'ahu District Superintendent be notified when the construction schedule is finalized. Eric may be reached at 733-9102. Thank you for the opportunity to provide comments on the CDUA.

November 21, 2007

Mr. Daniel S. Quinn, Administrator
Division of State Parks
State of Hawai‘i Department of Land and Natural Resources
PO Box 621
Honolulu, HI 96809

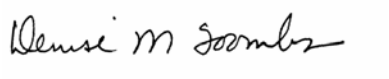
Re: Conservation District Use Application (CDUA OA-3435) and Draft Environmental Assessment (EA) for Australia-Hawaii Fiber Optic Cable System
Keawa‘ula, Wai‘anae, O‘ahu, Hawai‘i
TMK: (1) 8-1-001: 008 and Submerged Lands

Dear Mr. Quinn:

Thank you for your interest in the Australia-Hawaii Fiber Optic Cable Project. We appreciate your comments provided in the memorandum dated October 5, 2007. Best management practices will be used throughout the construction and installation phase, and precautions will be taken to minimize the disturbance to the natural environment and the public use of the beach. Mr. Eric Kato, O‘ahu District Superintendent, will be notified when the construction schedule is finalized.

If you have any additional comments or concerns, please feel free to contact me at 415.261.6693 or Anna Mallon in our Honolulu Office at 808.545.2462.

Best regards,



Denise M. Toombs
Senior Program Manager
Direct Tel.: 415.261.6693
Direct Fax: 415.644.0883
E-mail: denise.toombs@amec.com

c: Tiger Mills, DLNR Office of Conservation and Coastal Land
Anna Mallon, AMEC
Roy Carryer, Alcatel-Lucent

AMEC Earth & Environmental, Inc.
703 Market Street, Suite 1511
San Francisco, CA
USA 94103
Tel +1 415.261.6693
Fax +1 415.644.0883 www.amec.com

LINDA LINGLE
GOVERNOR OF HAWAII

ALLAN A. SMITH
INTERIM CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2007 SEP 13 A 11:01
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

September 12, 2007

M E M O R A N D U M

To: Russell Y. Tsuji
Administrator

Through: Steve Molmen
Supervising Land Agent

From: Steve Lau
Land Agent

Subject: Request for Authorization from the Department to Process a Conservation District Use Application to Telstra Inc. for an Australia-Hawaii Fiber Optic Cable System situated at Keawaula, Waianae, Oahu, Tax Map Key:(1) 8-1-001:008 and offshore submerged lands.

The above project, which involves the installation of a subsea fiber optic cable connection between the existing cable station and onshore telecommunication infrastructure situated at Keawaula, Waianae, TMK:(1)8-1-001:008 and offshore submerged lands, would require the applicant to obtain a land disposition from the Board of Land and Natural Resources.

Thank you for allowing us the opportunity to review and comment on the above project.

November 21, 2007

Mr. Russell Y. Tsuji, Administrator
Land Division
State of Hawai‘i Department of Land and Natural Resources
PO Box 621
Honolulu, HI 96809

Re: Conservation District Use Application (CDUA OA-3435) and Draft Environmental Assessment (EA) for Australia-Hawaii Fiber Optic Cable System
Keawa‘ula, Wai‘anae, O‘ahu, Hawai‘i
TMK: (1) 8-1-001: 008 and Submerged Lands

Dear Mr. Tsuji:

Thank you for your interest in the Australia-Hawaii Fiber Optic Cable Project. On behalf of Telstra, Inc., we appreciate the opportunity to work with the Land Division through the approval and permitting process. We are currently finalizing our easement (land disposition) application for submittal to the Land Division this month.

If you have any additional comments or concerns, please feel free to contact me at 415.261.6693 or Anna Mallon in our Honolulu Office at 808.545.2462.

Very Respectfully,

Denise M Toombs

Denise M. Toombs
Senior Program Manager
Direct Tel.: 415.261.6693
Direct Fax: 415.644.0883
E-mail: denise.toombs@amec.com

c: Tiger Mills, DLNR Office of Conservation and Coastal Land
Steve Lau, DLNR Land Division
Al Jodar, DLNR Land Division
Anna Mallon, AMEC
Roy Carryer, Alcatel-Lucent

AMEC Earth & Environmental, Inc.
703 Market Street, Suite 1511
San Francisco, CA
USA 94103
Tel +1 415.261.6693
Fax +1 415.644.0883 www.amec.com

Division of Forestry & Wildlife

1151 Punchbowl Street, Rm. 325 ▯ Honolulu, HI 96813 ▯ (808) 587-0166 ▯ Fax: (808) 587-0160

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2007 SEP 26 P 2:49
DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

September 24, 2007

MEMORANDUM

TO: Tiger Mills, Planner
Office of Conservation and Coastal Land

FROM: Paul J. Conry, Administrator
For Division of Forestry and Wildlife

SUBJECT: CDUA OA-3435, Draft EA/CDUA for the Australia-Hawaii Fiber Optic Cable System by Telstra Inc. at Keawaula, Waianae, Island of Oahu TMK: (1) 8-1-001: 008 and submerged lands.

We appreciate the opportunity to comment on this project. DLNR, Division of Forestry and Wildlife have the following corrections to add relating to the statements made in the subject EA.

- Page 4-22 incorrectly states that the project is within the Kaena Point Natural Area Reserve.
- The correct scientific name of the Wedge-tailed Shearwater is *Puffinus pacificus* and not *Monachus schauinslandi* as reported on page 4-22.

The Division appreciates the opportunity to comment on this CDUA, OA-3435 at Keawaula, Waianae, Island of Oahu.

November 21, 2007

Mr. Paul J. Conry, Administrator
Division of Forestry and Wildlife
State of Hawai‘i Department of Land and Natural Resources
1151 Punchbowl St. Rm. 325
Honolulu, HI 96813

Re: Conservation District Use Application (CDUA OA-3435) and Draft Environmental Assessment (EA) for Australia-Hawaii Fiber Optic Cable System
Keawa‘ula, Wai‘anae, O‘ahu, Hawai‘i
TMK: (1) 8-1-001: 008 and Submerged Lands

Dear Mr. Conry:

Thank you for your interest in the Australia-Hawaii Fiber Optic Cable Project. On behalf of Telstra, Inc., we appreciate your comments in the memorandum dated September 24, 2007. The Environmental Assessment will be revised to reflect the correct scientific name for the Wedge-tailed Shearwater (*Puffinus pacificus*), and the project's location in relation to the Kaena Point Natural Area Reserve.

If you have any additional comments or concerns, please feel free to contact me at 415.261.6693 or Anna Mallon in our Honolulu Office at 808.545.2462.

Very Respectfully,

Denise M Toombs

Denise M. Toombs
Senior Program Manager
Direct Tel.: 415.261.6693
Direct Fax: 415.644.0883
E-mail: denise.toombs@amec.com

c: Tiger Mills, DLNR Office of Conservation and Coastal Land
Anna Mallon, AMEC
Roy Carryer, Alcatel-Lucent

LINDA LINGLE
GOVERNOR OF HAWAII

AQUATIC RESOURCES: 1131

DIRECTOR	✓
COMM. FISH.	
AQ RES/ENV	
AQ REC	
PLANNER	
STAFF SVCS	
RCUH/UH	
STATISTICS	
AFRC/FED AID	
EDUCATION	
SECRETARY	
OFFICE SVCS	
TECH ASST	✓
Return to:	
No. Copies	
Copies to:	
Due:	

RSV
AM

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF:OCCL:TM

CDUA: OA-3435
Acceptance Date: September 11, 2007
180-Day Exp. Date: March 9, 2008
SUSPENSE DATE: 21 Days
from stamped date: SEP 21 2007

MEMORANDUM:

RECEIVED SEP 21 2007 AQUATIC RESOURCES

TO: The Department of Land and Natural Resources Divisions of:

___ Aquatic Resources
___ Conservation and Coastal Lands
___ Forestry and Wildlife
___ Engineering
___ Historic Preservation

Farley Carp
EA, CD's
NOAA
Eric Ng
SMA Coord

FROM: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

RECEIVED OFFICE OF CONSERVATION AND COASTAL LANDS 2007 OCT -3 P 3:22
DEPT. OF LAND & NATURAL RESOURCES STATE OF HAWAII

SUBJECT: REQUEST FOR COMMENTS
Draft Environmental Assessment/Conservation District Use Application OA-3435 for the Australia-Hawaii Fiber Optic Cable System

APPLICANT: Telstra Inc.

TMKs: (1) 8-1-001:008 and submerged lands

LOCATION: Keawaula, Waianae, island of Oahu

PUBLIC HEARING: **YES X** NO

Please contact Tiger Mills at 587-0382, should you have any questions on this matter. If no response is received by the suspense date, we will assume there are no comments. The suspense date starts from the date stamp.

(X) Comments Attached

( ) No Comments

Signature

Attachment(s)

10/3/07

Suspense Date: October 12, 2007

State of Hawaii
Department of Land and Natural Resources
DIVISION OF AQUATIC RESOURCES

Date: 10/2/07

MEMORANDUM
TO: Francis Oishi, Program Manager
FROM: Alton Miyasaka, Aquatic Biologist
SUBJECT: Comments on Draft EA/CDUA OA-3435

Comment	Date	Request	Receipt	Referral
Requested by: Sam Lemmo	of:	9/11/07	9/21/07	9/21/07

Summary of Proposed Project

Title: Australia-HI Fiber Optic Cable System

Project by: Telstra Inc.

Location: Keawaula, Waianae, Oahu
TMK (1) 8-1-001:008 and submerged lands

Brief Description: The applicant proposes to install a subsea fiber optic cable for telecommunication between existing cable stations in Keawaula, Oahu and Sydney, Australia. The proposed project would use existing infrastructure and improve current capacity.

Comments:
Our usual construction comments and recommendation for best management practices apply. The proposed project is not expected to adversely impact aquatic resource values, provided normal precautions are taken to minimize disturbances to public due to construction and installation activities.

November 21, 2007

Mr. Francis Oishi, Program Manager
Division of Aquatic Resources
State of Hawai‘i Department of Land and Natural Resources
PO Box 621
Honolulu, HI 96809

Re: Conservation District Use Application (CDUA OA-3435) and Draft Environmental Assessment (EA) for Australia-Hawaii Fiber Optic Cable System
Keawa‘ula, Wai‘anae, O‘ahu, Hawai‘i
TMK: (1) 8-1-001: 008 and Submerged Lands

Dear Mr. Oishi:

Thank you for your interest in the Australia-Hawaii Fiber Optic Cable Project. On behalf of Telstra, Inc., we appreciate your comments provided in the memorandum dated October 2, 2007. Best management practices will be used throughout the construction and installation phase, and precautions will be taken to minimize the disturbance to the natural environment and public use of the beach.

If you have any additional comments or concerns, please feel free to contact me at 415.261.6693 or Anna Mallon in our Honolulu Office at 808.545.2462.

Best regards,

Denise M Toombs

Denise M. Toombs
Senior Program Manager
Direct Tel.: 415.261.6693
Direct Fax: 415.644.0883
E-mail: denise.toombs@amec.com

c: Tiger Mills, DLNR Office of Conservation and Coastal Land
Alton Miyasaka, DLNR Division of Aquatic Resources
Anna Mallon, AMEC
Roy Carryer, Alcatel-Lucent

AMEC Earth & Environmental, Inc.
703 Market Street, Suite 1511
San Francisco, CA
USA 94103
Tel +1 415.261.6693
Fax +1 415.644.0883 www.amec.com

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS
2007 OCT 10 A 10: 31

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF:OCCL:TM

CDUA: OA-3435
Acceptance Date: September 11, 2007
180-Day Exp. Date: March 9, 2008
SUSPENSE DATE: 21 Days
from stamped date: SEP 21 2007

MEMORANDUM:

TO: The Department of Land and Natural Resources Divisions of:

___ Aquatic Resources
___ Conservation & Resource Enforcement
___ Forestry & Wildlife
✓ Engineering
___ Historic Preservation

FROM: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

SUBJECT: REQUEST FOR COMMENTS
Draft Environmental Assessment/Conservation District Use Application OA-3435 for the Australia-Hawaii Fiber Optic Cable System

APPLICANT: Telstra Inc.

TMKs: (1) 8-1-001:008 and submerged lands

LOCATION: Keawaula, Waianae, island of Oahu

PUBLIC HEARING: **YES X** NO

Please contact Tiger Mills at 587-0382, should you have any questions on this matter. If no response is received by the suspense date, we will assume there are no comments. The suspense date starts from the date stamp.

☒ Comments Attached

( ) No Comments

Signature

Attachment(s)

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

REF.: OCCL:TM/OA-3435AustraliaFiberOptic
Oahu. 579

COMMENTS

(X) **We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone D and also in seawater. The Flood Insurance Program does not have any regulations for developments within Zone D and in seawater.**

( ) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

( ) Please note that the project must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Robert Sumimoto at (808) 768-8097 or Mr. Mario Siu Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.

( ) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.

( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.

( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

( ) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments:_____

( ) Other: _____

Should you have any questions, please call Ms. Suzie Agraan of the Planning Branch at 587-0258.

Signed: _____
ERIC T. HIRANO, CHIEF ENGINEER

Date: 10/10/07

November 21, 2007

Mr. Eric T. Hirano, Chief Engineer
Engineering Division
State of Hawai‘i Department of Land and Natural Resources
PO Box 621
Honolulu, HI 96809

Re: Conservation District Use Application (CDUA OA-3435) and Draft Environmental Assessment (EA) for Australia-Hawaii Fiber Optic Cable System
Keawa‘ula, Wai‘anae, O‘ahu, Hawai‘i
TMK: (1) 8-1-001: 008 and Submerged Lands

Dear Mr. Hirano:

Thank you for your interest in the Australia-Hawai‘i Fiber Optic Cable Project. On behalf of Telstra Inc., we appreciate your comments dated October 10, 2007, and a confirmation that the project site is located within a Flood Insurance Rate Map (FIRM) Zone D, and seawater; therefore no regulations for development apply.

If you have any additional comments or concerns, please feel free to contact me at 415.261.6693 or Anna Mallon in our Honolulu Office at 808.545.2462.

Best regards,

Denise M Toombs

Denise M. Toombs
Senior Program Manager
Direct Tel.: 415.261.6693
Direct Fax: 415.644.0883
E-mail: denise.toombs@amec.com

c: Tiger Mills, DLNR Office of Conservation and Coastal Land
Anna Mallon, AMEC
Roy Carryer, Alcatel-Lucent

AMEC Earth & Environmental, Inc.
703 Market Street, Suite 1511
San Francisco, CA
USA 94103
Tel +1 415.261.6693
Fax +1 415.644.0883 www.amec.com

PHONE (808) 594-1888

FAX (808) 594-1865

RECEIVED
OFFICE OF CONSERVATION
& COASTAL LANDS
2007 OCT 11 A 8:08

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD07/3235

October 5, 2007

Samuel J. Lemmo
Administrator
Office of Conservation and Coastal Lands
1151 Punchbowl, Rm 131
Honolulu, HI 96813

RE: Request for comments on the Draft Environmental Assessment/Conservation District Use Application OA-3435 for the Australia-Hawai'i Fiber Optic Cable to affect TMK: 1-8-1-001: 008 and submerged lands.

Dear Samuel Lemmo,

The Office of Hawaiian Affairs (OHA) is in receipt of your Sept. 21, 2007, request for comments on applicant Telstra Inc.'s proposed project, which calls for the installation of one fiber optic cable between the existing cable station and onshore telecommunications infrastructure at Keawa'ula, O'ahu, and an existing infrastructure in Sydney, Australia. OHA offers the following comments:

OHA understands the purpose of the project and appreciates that the fiber optic line will be laid on an existing nearshore route occupied by other undersea cables, thereby reducing the impact of the project on the environment. OHA will rely on the applicant's assurances that the beach at Ka'ena Point State Park will be restored to pre-construction conditions and that the project will only close off a portion of the beach for a limited amount of time, and that the rest of the beach will remain open to fishers and recreational users. In addition, we commend the applicant for its intention to cut back - rather than uproot - the vegetation in the project area. However, OHA requests that special attention be given to the area's native plants, particularly the pōhuehue, kou and 'uhaloa. While they are not threatened or endangered, these native plants are still precious natural resources.

While OHA appreciates that an archaeologist will be present during the excavation and trenching process, we recommend that in the case human remains or Hawaiian cultural objects are discovered during the course of this project, all work will cease, and the State Historic Preservation Division be notified.

Further, OHA will rely on the applicant's assurances that it will mitigate the effects of the project on area marine life by following the Marine Protected Species Protection Protocols and the National Oceanic and Atmospheric Administration's recommendations.

Finally, it should be noted that the state lands, including the submerged lands, being used for the project are ceded lands, which hold a considerable amount of sentimental, historical and legal significance for Native Hawaiians and OHA. These lands were illegally taken from the Hawaiian Kingdom after the 1893 overthrow and later transferred ("ceded") by the United States government to the State of Hawai'i upon statehood. Today, the state holds these lands in trust for Native Hawaiians and the general public.

Thank you for the opportunity to comment. If you have further questions, please contact Sterling Wong (808) 594-0248 or e-mail him at sterlingw@oha.org.

Sincerely,

Clyde W. Nāmu'o
Administrator

November 21, 2007

Mr. Clyde W. Nāmuʻo, Administrator
Office of Hawaiian Affairs
State of Hawaiʻi
711 Kapiolani Blvd., Suite 500
Honolulu, HI 96813

Re: Conservation District Use Application (CDUA OA-3435) and Draft Environmental Assessment (EA) for Australia-Hawaii Fiber Optic Cable System
Keawaʻula, Waiʻanae, Oʻahu, Hawaiʻi
TMK: (1) 8-1-001: 008 and Submerged Lands

Dear Mr. Nāmuʻo:

Thank you for your interest in the Australia-Hawaii Fiber Optic Cable Project. On behalf of Telstra, Inc., we appreciate your comments provided in a letter dated October 5, 2007, and understand that this land holds sentimental, historical, and cultural value to the Native Hawaiians and OHA.

As indicated in the project description and acknowledged in your letter, the fiber optic cable will be laid within an existing near-shore route occupied by other subsea cables. Precautions will be taken to minimize impacts to the natural environment, including avoiding, when possible, the disturbance of native plants such as the *pōhuehue*, *kou*, and *ʻuhaloa*. Disruption of public access will be restricted to the work area for public safety.

An archaeologist will be on-site during all ground disturbing work, and in the event human remains or Hawaiian cultural objects are discovered, work will cease and the State Historic Preservation Division will be notified.

We have also been coordinating with the National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service to ensure protection of marine life during the installation of the cable project. Formal consultation is underway between the U.S. Army Corps of Engineers and NOAA as part of the Department of the Army Permit.

If you have any additional comments or concerns, please feel free to contact me at 415.261.6693 or Anna Mallon in our Honolulu Office at 808.545.2462.

Best regards,

Denise M Toombs

Denise M. Toombs
Senior Program Manager

AMEC Earth & Environmental, Inc.
703 Market Street, Suite 1511
San Francisco, CA
USA 94103
Tel +1 415.261.6693
Fax +1 415.644.0883 www.amec.com

c: Tiger Mills, DLNR Office of Conservation and Coastal Land
Sterling Wong, OHA
Anna Mallon, AMEC
Roy Carryer, Alcatel-Lucent

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
BUREAU OF CONVEYANCES
COMMISSION ON WATER RESOURCE MANAGEMENT
CONSERVATION AND COASTAL LANDS
CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

OFFICE OF CONSERVATION AND COASTAL LANDS
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

REF:OCCL:TM

CDUA: OA-3435
Acceptance Date: September 11, 2007
180-Day Exp. Date: March 9, 2008
SUSPENSE DATE: 21 Days
from stamped date: SEP 2 1 2007

MEMORANDUM:

TO: The Department of Land and Natural Resources Divisions of:

___ Aquatic Resources
✓ Conservation & Resource Enforcement
___ Forestry & Wildlife
___ Engineering
___ Historic Preservation

FROM: Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

SUBJECT: REQUEST FOR COMMENTS
Draft Environmental Assessment/Conservation District Use Application OA-3435 for the Australia-Hawaii Fiber Optic Cable System

APPLICANT: Telstra Inc.

TMKs: (1) 8-1-001:008 and submerged lands

LOCATION: Keawaula, Waianae, island of Oahu

PUBLIC HEARING: **YES X** NO

Please contact Tiger Mills at 587-0382, should you have any questions on this matter. If no response is received by the suspense date, we will assume there are no comments. The suspense date starts from the date stamp.

( ) Comments Attached

(X) No Comments

Signature

Attachment(s)

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
TELEPHONE: (808) 768-8000 • FAX: (808) 527-6743
INTERNET: www.honolulu.gov • DEPT. WEB SITE: www.honoluludpp.org

RECEIVED
OFFICE OF CONSERVATION
AND COASTAL LANDS

2007 NOV -5 A 8:42

DEPT. OF LAND &
NATURAL RESOURCES
STATE OF HAWAII

MUFI HANNEMANN
MAYOR

HENRY ENG, FAICP
DIRECTOR

DAVID K. TANOUE
DEPUTY DIRECTOR

2007/ELOG-2166, 2698(ST)

November 1, 2007

Mr. Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands
Department of Land and Natural Resources
P. O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Lemmo:

Subject: Draft Environmental Assessment for CDUA: OA-3435
Telstra Inc., Australia-Hawaii Fiber Optic Cable System
Keawaula Beach, Kaena State Beach Park - Waianae
Tax Map Key 8-1-1: Portion 8

We have reviewed the Draft Environmental Assessment (EA) and Conservation District Use Application (CDUA) for the above-referenced project received on September 24, 2007 and have the following comments. We apologize for the late response.

Section 6.3.1 Special Management Area and Shoreline Setback

Special Management Area (SMA) - We note that the entire land side area of the project is within the SMA. The Final EA should include an exhibit that shows the SMA boundary relative to the project area. All construction activity including storage and staging for cable laying, which occurs within the existing utility or roadway easement, is not considered development within the SMA. Pursuant to Section 25-1.3(2)(M), Revised Ordinance of Honolulu (ROH), an SMA Use Permit will not be required for work within the existing easement. In order to clarify the SMA requirements for this project, we strongly suggest that the Final EA include an exhibit that shows the existing submarine cable easement, relative to the proposed work areas.

Development activities that are outside the existing cable easement will require the approval of an SMA use permit. If the valuation of such activity is less than $125,000 and has no significant effect on coastal resources, the Department of Planning and Permitting can grant a minor SMA permit. Based on the cost estimate of $200,000 for the landing operation (section 2.4.5), it does not appear that such development (outside existing easements) will require a Major SMA Use Permit, which is approved by the Honolulu City Council.

Shoreline Setback Variance (SV) - The Draft EA indicates that a shoreline setback variance will be required. Since neither a shoreline survey or a certified shoreline is included or indicated, we are unable to confirm if a shoreline setback variance will be required. According to the CDUA application, the previous certified shoreline determined in 1991 was 65 feet makai

(seaward) of Farrington Highway. It the shoreline location has not changed, the proposed excavation indicated on Figure 2.5 (p. 2-11) would require the approval of a shoreline setback variance.

However, if the shoreline were certified (currently in process) substantially mauka (landward) of the 1991 location, it is possible that the 40-foot shoreline setback area would occur over the existing steel conduits, which are not being excavated or altered. If so, a shoreline setback variance would not be required since the insertion of the new or replacement fiber optic cables within the unaltered existing steel conduits could be considered as "repair or alterations" of the existing structure. We suggest that the certified shoreline, when the certification process is completed, be incorporated into an exhibit of the Final EA, which clearly addresses compliance with the shoreline setback regulations of Chapter 23, ROH.

We also request that excavation estimates be provided in the Final EA for work which is to the conducted within the 40-foot shoreline setback area.

Chapter 6 Consistency and Compliance with Federal, State and Local Regulations, Plans, and Policies

A separate section should be included in the Final EA that briefly discuss how the proposed project is consistent with applicable objectives and policies of the City and County of Honolulu's Waianae Sustainable Communities Plan.

Another separate section should be added in the Final EA which discloses and describes how the project is consistent with, and complies with, the objectives and policies of the shoreline setback regulations, Chapter 23, ROH. This section of the Final EA will essentially become the application for a shoreline setback variance.

If you have any questions, please contact Steve Tagawa of our staff at 768-8024.

Very truly yours,

for Henry Eng, FAICP, Director
Department of Planning and Permitting

HE:nt

cc: OEQC
Denise Toombs, AMEC

G:\SteveT\DEATelstra.com

November 21, 2007

Mr. Henry Eng, Director
Department of Planning and Permitting
City and County of Honolulu
530 S. King St., 7th floor
Honolulu, HI 96813

Re: Conservation District Use Application (CDUA OA-3435) and Draft Environmental Assessment (EA) for Australia-Hawaii Fiber Optic Cable System
Keawaʻula, Waiʻanae, Oʻahu, Hawaiʻi
TMK: (1) 8-1-001: 008 and Submerged Lands

Dear Mr. Eng:

Thank you for your interest in the Australia-Hawaii Fiber Optic Cable Project. On behalf of Telstra Inc., we appreciate your comments provided in your letter dated November 1, 2007, and the opportunity to work with the City and County of Honolulu throughout the approval and permitting process.

In regards to the Special Management Area (SMA), the Final EA will include a figure showing the SMA boundaries and the existing cable easements relative to the Australia-Hawaiʻi project. It is our understanding that an SMA Use Permit will not be necessary per Chapter 25 of the Revised Ordinance of Honolulu, Section (2)(M), which defines exemptions. The following activity is not considered development: "Installation of underground utility lines and appurtenant aboveground fixtures less than four feet in height along existing corridors." The above-noted project conforms with this definition. This was also discussed at a pre-application meeting with the Department of Planning and Permitting in April 2007, and subsequent follow-on discussions.

A shoreline survey has been conducted and submitted to the State Land Division for certification. The Final EA will include a figure showing the shoreline relative to the project area. Based on preliminary discussions with the DLNR Office of Conservation and Coastal Land, it has been determined that a portion of the equipment staging area may fall within the shoreline setback area, therefore an application for a Shoreline Setback Variance (SSV) Permit will be submitted.

A discussion will be added to the Final EA Chapter 6, Consistency and Compliance with Federal, State, and Local Regulations, Plans, and Policies, describing the project's consistency and compliance with the objectives and policies of the shoreline setback regulations, Chapter 23 ROH. In addition, a section will be added to discuss the project's consistency with the Waianae Sustainability Communities Plan.

Excavation estimates will be added to Section 2.4 Proposed Action in the Final EA.

AMEC Earth & Environmental, Inc.
703 Market Street, Suite 1511
San Francisco, CA
USA 94103
Tel +1 415.261.6693
Fax +1 415.644.0883 www.amec.com

If you have any additional comments or concerns, please feel free to contact me at 415.261.6693 or Anna Mallon in our Honolulu Office at 808.545.2462.

Very Respectfully,

Denise M. Toombs
Senior Program Manager
Direct Tel.: 415.261.6693
Direct Fax: 415.644.0883
E-mail: denise.toombs@amec.com

c: Tiger Mills, DLNR Office of Conservation and Coastal Land
Steve Tagawa, City and County of Honolulu
Anna Mallon, AMEC
Roy Carryer, Alcatel-Lucent