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JUL 23 2012

July 11, 2012

Gary Hooser, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawai'i 96813

OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

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RECEIVED

**SUBJECT: Draft Environmental Assessment for Moloka'i Irrigation System
Hydropower Plant, Moloka'i, Hawai'i**

Dear Mr. Hooser:

The State of Hawai'i Department of Agriculture, Agricultural Resource Management Division has reviewed the Draft Environmental Assessment (EA) for the **Moloka'i Irrigation System Hydropower Plant** project and anticipates a Finding of No Significant Impact. Please publish notice in the next available OEQC Environmental Notice.

We have enclosed a completed OEQC Publication Form, one (1) copy of the document in pdf format on a CD, and one (1) hardcopy of the Draft EA. Should you have any questions, please contact Martin Nakasone of AECOM Technical Services, Inc. at (808) 529-7219 or via email at martin.nakasone@aecom.com.

Sincerely,

Brian Kau, P.E.
Administrator and Chief Engineer
Agricultural Resource Management Division





**ENVIRONMENTAL ASSESSMENT
FOR THE
MOLOKA‘I IRRIGATION SYSTEM
HYDROPOWER PLANT
MOLOKA‘I, HAWAI‘I**

State of Hawai‘i Department of Agriculture
Agricultural Resource Management Division
1428 South King Street
Honolulu, Hawai‘i 96814

July 2012

**ENVIRONMENTAL ASSESSMENT
FOR THE
MOLOKA‘I IRRIGATION SYSTEM
HYDROPOWER PLANT
MOLOKA‘I, HAWAI‘I**

TMK: (2)-53-003:015

Prepared for:

State of Hawai‘i Department of Agriculture
Agricultural Resource Management Division
1428 South King Street
Honolulu, Hawai‘i 96814

Prepared by:

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July 2012

PROJECT SUMMARY

Project	Moloka'i Irrigation System – Hydropower Plant
Proposing Agency/Applicant	State of Hawai'i Department of Agriculture Agricultural Resource Management Division 1428 South King Street Honolulu, Hawai'i 96814
Consultant/Preparer	AECOM Technical Services 1001 Bishop Street, Suite 1600 Honolulu, Hawai'i 96813
Accepting Authority	Office of Environmental Quality Control 235 South Beretania Street, Suite 702 Honolulu, Hawai'i 96813
Property Owner/Lessee	Moloka'i Ranch
Tax Map Key	(2)-53-003:015
Location	Moloka'i Ranch, Moloka'i
Agencies Consulted	Department of Land and Natural Resources Maui County, Department of Planning and Permitting
State Land Use	Agriculture
Existing Land Use	Agriculture
Proposed Action	Turbine-generator installation along existing easement of the Moloka'i Irrigation System pipeline to recover energy used to pump water from the Waikolu Valley. This would generate renewable energy, which would help to reduce Moloka'i's dependence on diesel fuel for electricity generation.
Anticipated Determination	Finding of No Significant Impact (FONSI)
Permits that May be Required	State Public Utilities Commission Approval – Net energy metering Agreement, Department of Public Works – Building Permit, Grading & Grubbing Permit

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Photo 1: Existing MIS Pipe at the Proposed Project Location

Photo 2: Existing MIS Pipe at the Proposed Project Location with Representative Vegetation Shown

ACRONYMS AND ABBREVIATIONS

°F	degree Fahrenheit
§	Section
ALISH	Agricultural Lands of Importance to the State of Hawai'i
ALUM	Agricultural Land Use Map
BMP	best management practice
DAR	State of Hawai'i Division of Aquatic Resources
dBA	decibel (A-weighted scale)
DOA	Department of Agriculture
DOH	Department of Health, State of Hawai'i
EA	Environmental Assessment
ft	feet or foot
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FONSI	Finding of No Significant Impact
HAR	Hawai'i Administrative Rules
HIOSH	Hawai'i Occupational Safety and Health Division, Department of Labor and Industrial Relations
HRS	Hawai'i Revised Statutes
HvB	Holomua silt loam
HvB3	Holomua silt loam, severely eroded
IA	Implementing Actions
LaE3	Lahaina silty clay, severely eroded
MCC	Maui County Code
MECO	Maui Electric Company
MIS	Moloka'i Irrigation System
NAAQS	National Ambient Air Quality Standards
OME	Oli silt loam
PLC	programmable logic controller
ROI	region of influence
RvT2	Very stony land, eroded
SCADA	Supervisory Control and Data Acquisition
UIC	underground injection control
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey

1.0 INTRODUCTION

The Moloka'i Irrigation System (MIS) is the largest state-owned system in Hawai'i. It is about 25 miles long from its source in Waikolu Valley on the northeast coast of Moloka'i to the western end of its distribution system in southwestern Moloka'i. MIS collects water from the northern Waikolu Valley to support farming of the semi-arid central plains of the Ho'olehua and Pala'a.

The proposed hydropower project is located along the MIS on the southern side of central Moloka'i within Moloka'i Ranch property boundaries (Figure 1). The proposed project is a minor modification to the MIS, whereby energy used for pumping water in the Waikolu Valley would be partially recovered by a turbine-generator installed alongside the existing pipeline. The proposed project would generate renewable energy, which would help to reduce Moloka'i's dependence on diesel fuel for electricity generation. Electricity on Moloka'i is supplied by Maui Electric Company (MECO).

The proposed project would complement the existing irrigation systems and would not adversely impact deliveries of water for irrigation.

1.1 PURPOSE AND NEED

The MIS is a major consumer of electricity used for pumping water from Waikolu Stream and from wells into the system and boosting water pressure on the irrigation distribution system. Hydroelectric power generation could reduce the ongoing costs of operating and maintaining the system by reducing the amount of electricity purchased to pump water into the system and by generating revenue from the sale of electricity to MECO.

Renewable energy generated by small hydropower projects would also reduce imports of oil for conventional diesel electric power generation and help Moloka'i to meet the State of Hawai'i's 2030 Clean Energy Initiative of 70 percent clean energy by 2030.

1.2 PROJECT DESCRIPTION

1.2.1 Project Components

The proposed project would comprise the following components:

- Outdoor horizontal Francis turbine and generator enclosed in a weatherproof shelter
- Piping and fittings to connect the turbine in a bypass arrangement
- Outdoor synchronous bypass valve with fail-safe counterweight (gravity) closure mechanism
- Controls and electrical equipment housed in an outdoor free-standing weatherproof enclosure or mounted on a concrete masonry unit wall
- Installation of new section of power line to interconnect the project to the existing MECO power line which also feeds the Moloka'i tunnel
- Relocation of primary meter from the Moloka'i tunnel to power line interconnection
- Provide provisions for Hawai'ian Telcom to install a new section of telephone line to interconnect the project to the existing Hawai'ian Telcom line which also feeds the Moloka'i tunnel
- Renewable energy electrical interconnection with MECO

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LOCATION MAP



NOTES

- 1. Map projection: Hawaii State Plane Zone 3, NAD83.
- 2. Aerial photo source: USGS 2006.



Figure 1
Site Location Map
Moloka'i Irrigation System -
Hydropower Plant
Moloka'i, Hawaii'i

1.2.2 Micro-Hydro Technology

The micro-hydro technology for the proposed project consists of a Francis turbine generator which is an inline water turbine and generator combined unit. Due to the small flows within the pipeline, a Francis turbine generator provides electricity within a smaller footprint. Two turbine manufacturers, Dependable and Norcan, are currently being evaluated to determine which would be more cost efficient for the proposed project.

1.2.3 Turbine Control and SCADA

1.2.3.1 TURBINE CONTROL

The operation of the turbine would have two modes – manual and automatic. Manual mode would allow an operator to start, stop, and adjust the turbine locally using a site located human machine interface or remotely using a Supervisory Control and Data Acquisition (SCADA) system. Automatic operation would involve control of the turbine based on input from a pressure transducer.

The other important part of the system would be the synchronous bypass valve and its operation and control. This valve must be open whenever the turbine shuts down or when the pressure in the pipeline exceeds the maximum or minimum design flow of the turbine. The turbine system would include a built-in programmable logic controller (PLC). The PLC would allow stand-alone control of the turbine based on preprogrammed operating parameters, while the SCADA would monitor performance of the hydro system and allow remote control.

To ensure that water deliveries are maintained, the synchronous bypass valve would include a fail-safe open. Specifically, the valve would have a counterweight or spring that would open it, and would be held closed by a hydraulic cylinder. In the event of a transmission line or plant outage, the valve would automatically open to ensure that water delivery is maintained.

1.2.3.2 SCADA AND PLC SYSTEMS

The SCADA system at the hydroturbine site will communicate with the existing SCADA system at the Department of Agriculture (DOA) Moloka'i office by utilizing either a new telephone service from Hawaiian Telcom or a wireless radio system to communicate with the existing Moloka'i irrigation office via the West Portal. The existing SCADA system would need to be reprogrammed to accept the signal from the new hydro site and to allow remote monitoring via the internet.

The SCADA system would provide status updates and alarm features in case of malfunction of the hydropower system. The PLC system would include the hydroturbine-generator flow control, anti-surge control, load control, and unit sequencing.

1.2.4 Proposed Construction Activities

Proposed construction activities would include the following activities:

- Installation of appropriate erosion control measures
- Grubbing and grading of land to prepare for pouring of concrete slab
- Construction of concrete slab
- Installation of above ground pipe, turbine and all appurtenances
- Installation of power unit and enclosure
- Installation of above ground power line for connection to existing MECO power line
- Relocation of primary meter

- Reprogram the existing SCADA system at the DOA Moloka'i office to accept signal from proposed turbine
- Possible installation of wireless radio antenna or telephone cables on power line poles

1.2.5 Proposed Maintenance Activities

The Proposed Action would require no additional maintenance activities other than existing maintenance activities (i.e. maintaining access way, routine system inspections, etc).

1.2.6 Project Schedule and Cost

Construction activities related to the Proposed Action are expected to take no more than 12 months to complete. Approval of engineering designs is expected to occur in May 2012, and construction work is anticipated to begin in January 2013 and would be completed by December 2013.

The Proposed Action has a preliminary construction cost estimate of \$1.3 million. This project would be funded by DOA. Alternative 1 has an estimated cost of \$650,000.

1.3 PERMITS AND APPROVALS THAT MAY BE REQUIRED

The following permits and approvals may be required for construction and operation of the proposed Moloka'i Irrigation System - Hydropower Plant:

In addition to the environmental disclosure requirements of Hawai'i Revised Statutes (HRS) Chapter 343, implementation of the Proposed Action may require coordination and consultation with the following federal, state and county agencies for permits or approvals as presented in Table 1-1.

Table 1-1: Permits and Approvals for Implementation of the Proposed Action

Permit or Approval	Description	Regulation(s)	Administrative Authority
State Public Utilities Commission Approval – NEM Agreement	Approval for a net metering project that may exceed a 50 kW capacity and/or exceed the aggregate net metering capacity authorized for Moloka'i.	MECO, Rule 18 – Appendix II	PUC, MECO
Grading & Grubbing Permit	A Grading Permit is required for excavation of fill, or for the temporary storage of soil, sand, gravel, rock, or any similar material. A Grubbing Permit is required for any act by which vegetation, including trees, timber, shrubbery and plants, is uprooted and removed from the surface of the ground.	MCC Chapter 20.08	DOPW, DSD
Building Permit	A Building Permit is required for the construction, alteration, moving, demolition, repair, and use of any building or structure within the county.	MCC Section 16.08.050; 16.16A	DOPW, DSD

DOPW Department of Public Works
DSD Development Services Division
MCC Maui County Code
NEM net energy metering
PUC Public Utilities Commission

1.4 ANTICIPATED FINDINGS AND DETERMINATIONS

Based on the findings and the assessment of potential impacts from the proposed project, a Finding of No Significant Impact (FONSI) is anticipated.

2.0 PROPOSED ACTION AND ALTERNATIVES TO THE PROPOSED ACTION

This section provides background information on the proposed project and a description of the Proposed Action, the No-Action Alternative, and the Alternative considered but not carried forward.

2.1 PROPOSED ACTION

The Proposed Action includes the development of the hydraulic potential that exists in the gravity flow water transmission pipeline that feeds the Kualapu'u Reservoir (Photo Log). The project would involve installing a Francis generator turbine with-in the existing pipeline system and would require minimal modifications to the existing water delivery system (Figure 2).

Additionally, the Proposed Action also provides for the installation of a new overhead pole line from the hydropower installation facility back to the main dirt road at the junction that leads to West Portal and the relocation of the primary meter from the West Portal to the junction. This design would reuse a portion of the existing MECO service that currently feeds the Moloka'i Irrigation Tunnel, thus allowing the power generated by the new hydroturbine site to offset the power being purchased from MECO under a Net Energy Metering agreement. The length of this power line extension from the hydroturbine facility to the electrical point of connection is approximately 3,900 feet (ft). DOA would assume ownership of the MECO lines and poles from this junction to the west portal.

The Proposed Action was determined based on several factors, including public safety, construction cost, and sound engineering principles. Other factors considered included ease of access, community needs, environmental issues, aesthetics, local politics, permits and approvals, and land acquisitions required. This hydropower method would generate renewable energy and provide the assistance in achieving the State of Hawai'i's 2030 Clean Energy Initiative by reducing the need of conventional diesel electric power generation.

2.2 ALTERNATIVE 1

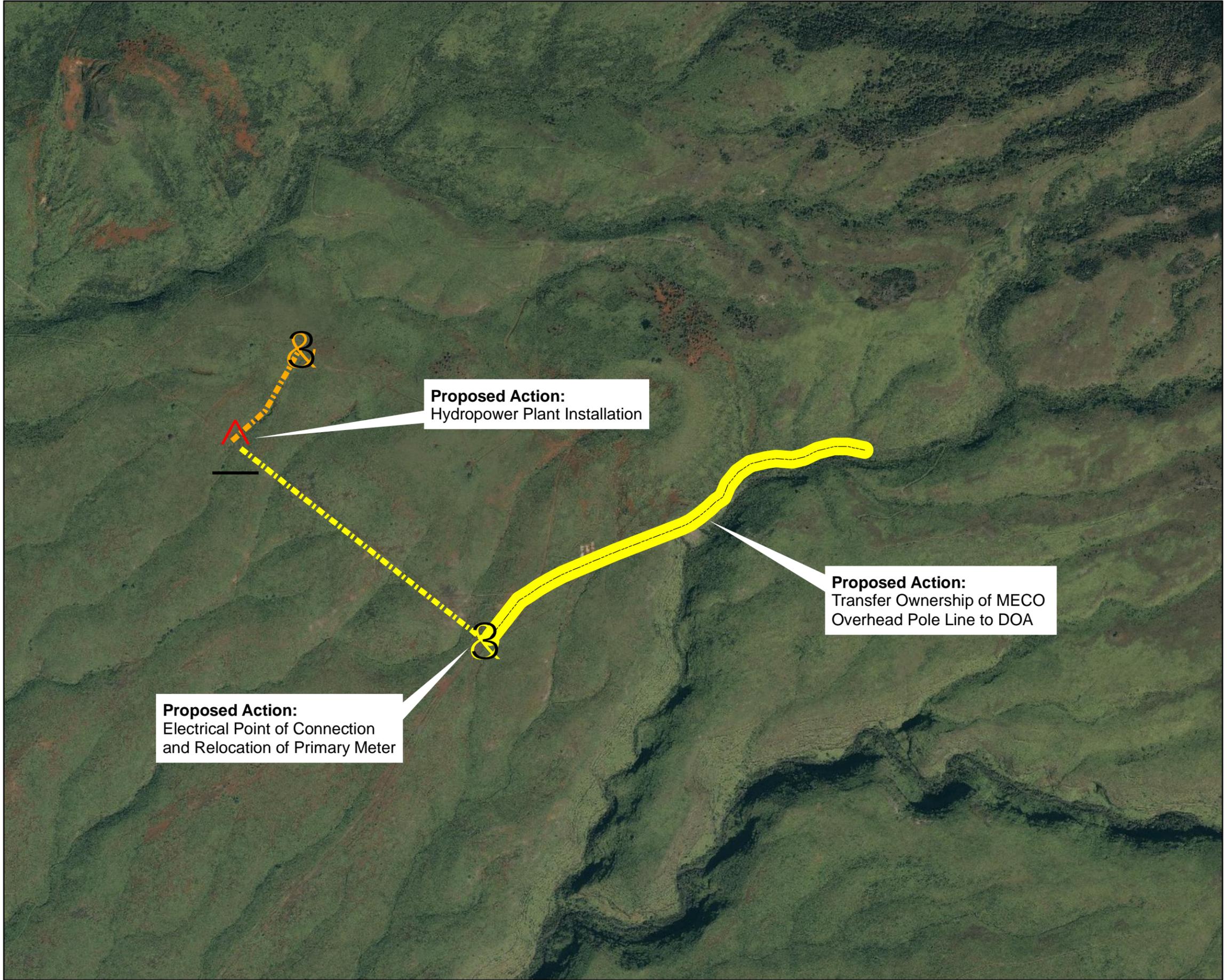
Alternative 1 provides for the installation of additional MECO poles in order to extend the overhead pole line to the nearest existing MECO pole located upslope from the hydroturbine facility. The line will run parallel to the existing gulley and extend approximately 1,250 ft, with pole installation approximately every 200 ft, from the hydroturbine facility to the electrical point of connection. This would also include two new electrical services. One service would be an overhead service from a pole mounted transformer that would provide power for the SCADA system, telemetry system, and miscellaneous loads at the hydropower site. The other service would be an underground service from a pad mounted transformer which would be used for the renewable energy connection to MECO and would require a Feed-In-Tariff interconnection agreement with MECO.

All the power generated at this site would offset energy purchases from MECO. All power generated with this Alternative would offset the power purchased from MECO; however it would receive a lower annual revenue and have greater detrimental impacts on biological resources by having to install power line poles upslope along the existing gulley that is significantly more vegetated than along the road.

2.3 NO-ACTION ALTERNATIVE

In addition to the Proposed Action and Alternative 1, the No-Action Alternative is analyzed in this environmental assessment (EA). Under the No-Action Alternative, the MIS would continue to consume electricity for pumping waters from wells into the irrigation system and existing costs of operating and maintaining the system would remain. Additionally, MIS would not participate in renewable energy efforts to reduce imports of oil to help Moloka'i meet the State of Hawai'i's 2030 Clean Energy Initiative.

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LOCATION MAP



LEGEND

- Proposed PowerLine
- Ownership Power Line
- Alternate 1 Power Line

NOTES

1. Map projection: Hawaii State Plane Zone 3, NAD83.
2. Aerial photo source: USGS 2006.



Figure 2
Proposed Action & Alternative Map
Moloka'i Irrigation System -
Hydropower Plant
Moloka'i, Hawai'i

2.4 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

The following hydroelectric development measure was considered but not carried forward for various reasons.

2.4.1 Waikolu Hydropower Development Alternative

The Waikolu Hydropower Development Alternative would involve construction of a new small intake about 3,500 ft upstream of the existing diversions on Waikolu Stream and installing a new surface penstock between the intake and the proposed powerhouse location near the entrance to the Moloka'i tunnel. The disadvantages to this alternative are high initial construction cost due to accessibility of location.

3.0 ENVIRONMENTAL SETTING, POTENTIAL IMPACTS, AND MITIGATION MEASURES

This chapter describes the affected environment associated with the Proposed Action and Alternatives, as well as the No-Action Alternative; the potential impacts to resources; and proposed mitigation measures. Cumulative effects and irretrievable and irreversible commitment of resources are also addressed in this chapter.

The affected environment describes the natural and man-made environments, which include climate and air quality, noise, geology and soils, water quality, biological resources, cultural resources, land use and ownership, visual resources, natural hazards, hazardous materials and hazardous waste, public facilities and services, and socioeconomics. Unless otherwise specified, the region of influence (ROI) for individual resources is the proposed project site.

3.1 CLIMATE AND AIR QUALITY

3.1.1.1 CLIMATE

Due to the orographic effect of the large mountains, there are rapid changes in rainfall over fairly short distances between the windward (northeastern) and leeward (western) sides of the island. The eastern end of Moloka'i is a tropical rainforest and can receive up to 300 inches of rainfall per year and the central and western parts of the island receive about 15 to 30 inches per year (USGS 2005). Wind direction can vary throughout the year, but trade winds from the northeast are common occurrences. Temperatures in the area are generally very consistent and moderate, with the Moloka'i Airport recording an annual average high of 82 degrees Fahrenheit (°F) and an annual average low of 67 °F. Periodically, air quality is affected by volcanic emissions from the distant Kilauea volcano on the island of Hawai'i.

3.1.1.2 AIR QUALITY

Ambient air quality, which refers to the purity of the general outdoor atmosphere, is regulated under the Clean Air Act and the U.S. Environmental Protection Agency National Ambient Air Quality Standards (NAAQS) (40 Code of Federal Regulations Part 50). The State of Hawai'i Department of Health (DOH) also regulates air quality and established ambient air quality standards (DOH 2001) that are as strict or, in some cases, stricter than the NAAQS. The State of Hawai'i has also established standards for fugitive dust emissions emanating from construction activities (DOH 2011). These standards prohibit any visible release of fugitive dust from construction sources without taking reasonable precautions.

The State of Hawai'i monitors ambient air quality for six regulated pollutants including:

- Particulate matter less than 10 microns
- Particulate matter less than 2.5 microns
- Carbon monoxide

- Ozone
- Sulfur dioxide
- Nitrogen dioxide

Areas where ambient levels of a criteria pollutant are below the NAAQS are designated as being in “attainment.” Areas where levels of a criteria pollutant equal or exceed the NAAQS are designated as being in “nonattainment.” In 2006, the State of Hawai‘i was in attainment for all criteria pollutants (DOH 2006).

3.1.2 Existing Air Quality

The project is located on a secured portion of Moloka‘i Ranch along a dirt access road that runs along the existing irrigation pipes. Emissions from distant motor vehicles and farming equipment are the primary source of air pollutants in the project vicinity. Due to the infrequent occurrences of these activities in the immediate project area, concentrations of ambient pollutants are assumed to be well below the federal and state ambient air quality standards. No additional information on air quality was collected.

3.1.3 Potential Impacts and Mitigation

3.1.3.1 PROPOSED ACTION

Only short-term construction-related impacts to air quality are anticipated with implementation of the Proposed Action. During construction, potential emission sources that may affect air quality at the project site include the following:

- Diesel and/or gasoline-powered construction equipment and motor vehicles (additional sources of carbon monoxide and carbon dioxide).
- Fugitive dust emissions resulting from grading.
- Construction vehicles traveling to and from the proposed project area and onsite construction equipment consisting of primarily diesel engines would contribute to local air pollution. Construction activities may also generate short-term fugitive dust particulate emissions.

Because levels of criteria pollutants in Hawai‘i are consistently well below federal and state air quality standards (DOH 2010), and because the prevailing trade winds rapidly carry pollutants offshore limiting the effect on receptors, increases in levels of criteria pollutants at the project area from construction activities are not expected to be significant. It is not anticipated that federal or state ambient air quality standards would be exceeded during construction activities.

3.1.3.2 ALTERNATIVE 1

Same as Proposed Action.

3.1.3.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no construction activities would occur at the project area. No additional emission sources would be added; therefore, there would be no impact to the existing air quality.

3.1.3.4 MITIGATION MEASURES

Construction activities would be conducted in accordance with State of Hawai‘i air pollution control regulations (DOH 2011) and would employ the proper administrative and engineered controls to reduce air emissions. Dust control measures including a dust control (watering) program would be implemented.

3.2 AGRICULTURAL RESOURCES

Agricultural resources are the natural production of food, feed, fiber and other desired products by cultivation of certain plants and the raising of domesticated animals. The island of Moloka'i relies heavily on its agricultural resources, primarily vegetable farming and cattle ranching, for economic stability by creating more jobs and more revenue than any other sector (e.g., tourism, service, government, etc.).

Due to the climatic convergence of dense tropical rainforests to temperate grasslands, central Moloka'i provides the optimal environment for farming. Fruits and vegetables crops are grown where extensive lowland plains and rich soils are abundant. In effort to preserve the agricultural reliance within the State of Hawai'i, the DOA created a mapping system to designate areas for specific farming purposes. The Agricultural Land Use Map (ALUM) displays farming lands designated for livestock, field crops, orchards, and other. Within those designations, the ALUM shows areas of specific product or activity such as grazing, dairy, flowers, papaya, coffee, aquaculture, and wetland crops.

The DOA also adopted an agricultural productivity rating system known as Agricultural Lands of Importance to the State of Hawai'i (ALISH). The value of agricultural land is evaluated through a description of soil attributes present within a specific area. The DOA evaluates and analyzes soil productivity, water retention, erosion, chemical makeup, and factors favorable for root growth. Hawai'ian lands meeting a criteria determined by the DOA fall under one of three classifications: *Prime*, *Unique*, and *Other*.

Prime – land that has the best physical, chemical, and climatic properties for crop production.

Unique – land that is best suited for special or high-value crops such as watercress, coffee, or taro.

Other – land that may not be the most productive, but is convenient for agricultural purposes because of its location, access to water, or other factors.

The network of these important agricultural lands forms the most valuable resources within Maui County.

3.2.1 Existing Agricultural Use

The Moloka'i Community Plan designates the project area as: *Agriculture (AC)* - *This use indicates areas for agricultural activity which would be in keeping with the economic base of the County and the requirements and procedures of Chapter 205 HRS, as amended.*

The ALUM shows that the project vicinity is primarily designated as grazing lands (Figure 3). A small herd of cattle are present and have the ability to roam and graze throughout this secured portion of Moloka'i Ranch where entrance must be accessed with permission through a series of locked gates. The project area is not located on any lands of importance as designated under the ALISH system. However; lands designated as *Other* are in close proximity to the project area.

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Agriculture Land Use - Grazing

Location Map



Legend

- Agricultural Importance Class**
- Prime Lands
 - Other
- Agriculture Land Use**
- Grazing
 - Vegetables/Melons
 - Pineapple
- Proposed Action:**
- Proposed Hydropower Plant Installation
 - Electrical Point of Connection and Relocation of Primary Meter
 - Alternative 1: Connection to Existing MECO Pole
 - Proposed Power Line
 - Ownership Power Line
 - Alternative 1 Power Line

Notes

1. Map projection: Hawaii State Plane Zone 3, NAD83
2. Aerial photo source: USGS, 2006
3. Data source: <http://hawaii.gov/dbedt/gis/>



Figure 3
Agricultural Land Use and
Agricultural Lands of Importance Map
Molokai Hydropower Project
Molokai, Hawaii

3.2.2 Potential Impacts and Mitigation

3.2.2.1 PROPOSED ACTION

Implementation of the Proposed Action would result in only minimal short-term impacts to agricultural resources. Due to the small footprint of the hydroturbine facility and the power line installment along the existing roadway, the cattle would still be able to graze throughout Moloka'i Ranch without restraint.

The Proposed Action would result in no change to the agricultural land use designation.

3.2.2.2 ALTERNATIVE 1

Same as Proposed Action.

3.2.2.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no construction activities would occur at the project area resulting in no change or disturbance to the existing agricultural resources. Therefore, no impacts from agricultural resources are anticipated under the No-Action Alternative.

3.2.2.4 MITIGATION MEASURES

Construction activities would be conducted in a manner that would protect both grazing animals and construction personnel from harm. If cattle are encountered near the Project area, construction activities would cease until animals are no longer within close proximity.

3.3 NOISE

Noise is defined as unwanted sound and is one of the most common environmental issues of concern to the public. A number of factors affect sound as it is perceived by the human ear. These include the actual level of the sound (or noise), the frequencies involved, the period of exposure to the noise, and changes or fluctuations in the noise levels during exposure. The accepted unit of measure for noise levels is the decibel because it reflects the way humans perceive changes in sound amplitude. Sound levels are easily measured, but human response and perception of the wide variability in sound amplitudes is subjective.

The State of Hawai'i regulates noise exposure in the following statutes and rules: HRS §342F - *Noise Pollution*, HAR §11-46 – *Community Noise Control* (DOH 1996a), and HAR §12-200.1 *Occupational Noise Exposure* (DLIR 2006). Maximum permissible sound levels for Class C zoning districts including all areas equivalent to lands zoned agriculture, country, industrial, or similar type, is 70 (decibel [A-weighted scale]) dBA between the hours of 7:00 AM and 10:00 PM and 70 dBA between 10:00 PM and 7:00 AM (DOH 1996a).

3.3.1 Existing Noise Environment

The project is located on Moloka'i Ranch in an area used for agricultural grazing approximately 3 miles from the nearest main road. No business, residential, farming or industrial establishments exist within a 2 mile radius from the project site. The absence of these establishments creates a very quiet noise environment.

3.3.2 Potential Impacts and Mitigation

3.3.2.1 PROPOSED ACTION

Noise generated during construction would be short-term. Construction equipment employed to implement the Proposed Action may include trucks, a crane, a back hoe, jack hammer, helicopter, diesel powered generators and air compressors. Noise generated by construction equipment could produce localized noise events of 100 dBA or higher at the construction site. Noise levels at 50 ft

typically range between 55 and 88 dBA for equipment such as pick-up or dump trucks, jackhammers, lift booms, and excavators. Typical noise emission levels for construction equipment are provided in Table 3-1.

Table 3-1: Typical Noise Emission Levels for Construction Equipment

Type of Equipment	Noise Level at 50 Ft (dBA)
Air Compressor	81
Backhoe	80
Bulldozer	82
Chain Saw	85
Concrete/Grout Pumps	82
Crawler Service Crane (100-Ton)	83
Dump Truck	88
Drill Rigs	88
Excavator	85
Front End Loader	80
Generator	81
Jackhammer (Compressed Air)	85
Lift Booms	85
Pick-Up Trucks	55
Power-Actuated Hammers	88
Water Pump	76
Water Truck	55

Source: HMMH 2006.

Construction noise would decrease with distance from the project area through divergence, atmospheric absorption, shielding by intervening structures, and absorption and shielding by ground cover. All internal combustion powered equipment would be muffled and work would be limited to daytime hours. Upon completion of work, the area would return to preconstruction noise levels. Therefore, noise impacts would be less than significant.

3.3.2.2 ALTERNATIVE 1

Same as Proposed Action.

3.3.2.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no construction activities would occur at the project area, and there would be no change to the existing noise environment. Therefore, no impacts from noise are anticipated under the No-Action Alternative.

3.3.2.4 MITIGATION MEASURES

To minimize noise impacts, construction activities would be conducted in accordance with State of Hawai'i requirements set forth in HRS §342F, *Noise Pollution* and HAR §11-46, *Community Noise Control* (DOH 1996a), which establish maximum permissible sound levels from excessive noise sources, noise prevention, control, and abatement guidelines, and permit criteria.

The Hawai'i Occupational Safety and Health Division (HIOSH) has set the permissible occupational noise exposure at 90 dBA for a continuous 8-hour exposure. Permissible noise exposures for shorter periods are higher, with a maximum exposure of 115 dBA permissible for a duration of 15 minutes or less (DLIR 2006). Enforcement of HIOSH occupational noise exposure regulations would be the

responsibility of the construction contractor. If workers experience noise exceeding HIOSH standards, administrative or engineering controls shall be implemented. Use of personal protective equipment such as earplugs or muffs may also be required.

To reduce nearby residential noise exposure, construction activities would be conducted on weekdays and in daytime hours in accordance with HRS §342-F-1. In the event that work occurs after normal working hours (i.e., at night or on weekends), or if permissible noise levels are exceeded, appropriate permitting and monitoring, as well as development and implementation of administrative and engineering controls shall be employed.

3.4 GEOLOGY AND SOILS

3.4.1 Geology

Moloka'i's roughly rectangular shape results from two main shield volcanoes: Mauna Loa referred to as West Moloka'i Volcano dates from about 1.9 million years ago, and Wailua referred to as East Moloka'i volcano dates from about 1.75 million years ago making it the fifth largest of the major Hawaiian Islands with an area of approximately 261 square miles. Lava from East Moloka'i flowed westerly above the lowland areas of the Ho'olehua Saddle and collided with the eastern flanks of the preexisting West Moloka'i volcano producing the elongated island.

Bisecting the island, the broad low-lying coastal plain along the south shore between the two volcanoes is composed of eroded sediment of the East and West Moloka'i Volcanoes. The southeastern edge of the island is bordered by an alluvial plain constructed from a series of semi-contiguous alluvial fans associated with upland gulches. Years after its last eruption, the northern portion of the east Moloka'i volcano slid into the ocean leaving behind the towering cliffs on the northeast side of the island.

3.4.2 Soils

The *Soil Survey of the Islands of Kauai, Oahu, Maui, Moloka'i, and Lanai*, prepared by the U.S. Department of Agriculture Soil Conservation Service (USDA 1972) classifies the soils of the project area in central/south-central Moloka'i as Holomua silt loam (HvB), Holomua silt loam, severely eroded (HvB3), Lahaina silty clay, severely eroded (LaE3), Oli silt loam (OME), and Very stony land, eroded (rVT2).

3.4.2.1 PROPOSED ACTION AREA SOILS

The soils of the Proposed Action area include the following:

- **Holomua silt loam, severely eroded (HvB3)** – Depth to a root restrictive layer is greater than 60 inches and slopes are generally 3 to 7 percent. The natural drainage class is well drained and water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low and no zone of water saturation within a depth of 72 inches. This soil does not meet hydric criteria.
- **Holomua silt loam (HvB)** – Depth to a root restrictive layer is greater than 60 inches and slopes are generally 3 to 7 percent. The natural drainage class is well drained and water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low and no zone of water saturation within a depth of 72 inches. This soil does not meet hydric criteria.
- **Very Stony Land, eroded (rVT2)** – Depth to a root restrictive layer (bedrock, paralithic) is 5 to 35 inches and slopes are generally 7 to 30 percent. The natural drainage class is well drained and water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is very low. Shrink-swell potential is moderate and no zone of water saturation within a depth of 72 inches. This soil does not meet hydric criteria.

3.4.2.2 ALTERNATIVE 1 SOILS

In addition to the soils of the Proposed Action area, the soils of Alternative 1 include a small presence of the following:

- **Holomua silt loam, severely eroded (HvB3)** – Depth to a root restrictive layer is greater than 60 inches and slopes are generally 3 to 7 percent. The natural drainage class is well drained and water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches is moderate. Shrink-swell potential is low and no zone of water saturation within a depth of 72 inches. This soil does not meet hydric criteria.

A soil classification map reflecting the Proposed Action area and the Alternative 1 area described above is provided as Figure 4.

3.4.3 Potential Impacts and Mitigation

3.4.3.1 PROPOSED ACTION

The Proposed Action includes temporary disturbance to the soils due to the grading of an area of approximately 2,500 square ft for the installation of the hydroturbine facility. A fence will also be installed surrounding this area and is estimated to be approximately 14 ft by 17 ft.

Additionally, the Proposed Action involves the installation of approximately 20 power poles, spaced every 200 ft, along the existing roadway to connect to the existing MECO power line poles. The construction footprint for each pole will be approximately 10 ft in diameter. The total disturbed area for the Proposed Action would be 4,100 square ft.

3.4.3.2 ALTERNATIVE 1

The Alternative would include the same temporary disturbance for the hydroturbine facility installation, but would involve an alignment that would require only approximately 6 power poles. The construction footprint for each pole would remain the same as the Proposed Action. The total disturbed area for the Alternative would be 2,620 square ft.

3.4.3.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no construction activities would occur at the project area, and there would be no change to the existing soils. Therefore, no impacts from soils are anticipated under the No-Action Alternative.

3.4.3.4 MITIGATION MEASURES

Disturbed areas would be properly managed using best management practices (BMPs) for erosion and sediment control. BMPs will include installation of dust control fences or silt fences, gravel berms silt barriers, site barriers or other approved sediment trapping devices at the downstream side of the grading area and sediment pit. These measures would be installed prior to ground disturbing activities and would be inspected and maintained throughout the construction period.

Path: P:\USIG\Civil\DOA\Molokai-Hawaii\Hydropower\400 Technical\406 Reports\406.1 Environmental Assessment\406.1.3 GIS\406.1.3.2 MXD\4. NRCS Soils.mxd



LOCATION MAP



LEGEND

- Soil Unit**
-  Holomua silt loam, severely eroded (HvB3)
 -  Holomua silt loam (HvB)
 -  Lahaina silty clay, severely eroded (LaE3)
 -  Oli silt loam (OME)
 -  Rock land (rRK)
 -  Very stony land, eroded (rVT2)
- Proposed Action:**
-  Proposed Hydropower Plant Installation
 -  Proposed Power Line
 -  Alternative 1: Connection to Existing MECO Pole
 -  Ownership Power Line
 -  Alternative 1 Power Line

NOTES

1. Map projection: Hawaii State Plane Zone 3, NAD83
2. Aerial photo source: USGS 2006
3. Data source: NRCS 2011

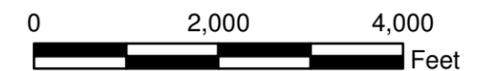


Figure 4
NRCS Soils
Molokai Hydropower Project
Molokai, Hawaii

3.5 WATER RESOURCES

This section describes the availability and quality of water resources, including surface water and groundwater. Surface water includes lakes, perennial/intermittent streams, and drainage ways. Groundwater includes water present in aquifers (perched, unconfined, confined, or artesian).

3.5.1 Surface Waters

Generation of surface water typically begins in the mountains as rainfall where surface water moves downgradient and collects in streams and gulches. A portion of this rainfall infiltrates through the ground surface and streambeds, recharging the underlying aquifer. Due to the geology and climate of Moloka'i, there is a high contrast in the distribution of water resources across the island. Eastern Moloka'i can receive up to 300 in of rainfall per year as a result from its high elevation and mountainous terrain. Western Moloka'i has a lower elevation with a relatively flat terrain which results in a scarcity of water resources.

The State of Hawai'i Division of Aquatic Resources (DAR) has created a coding system that identifies the island, region, and specific watershed of water resources located within the Hawai'ian Islands. The Hawai'i Stream Assessment code was created as a cooperative effort by the Commission on Water Resource Management, Department of Land Resources, University of Hawai'i, and the National Park Service to easily identify the island, hydrographic unit, stream, and tributary segments of streams in the Hawai'ian watersheds. The project area is located within the Kaunakakai Gulch (DAR Watershed Code 43010) and two streams, Kakalahale Stream and Kiowea Stream, codes 43011001 and 43012001 respectively, intersect the proposed project area and are represented in Figure 5 (DLNR).

3.5.2 Wetlands

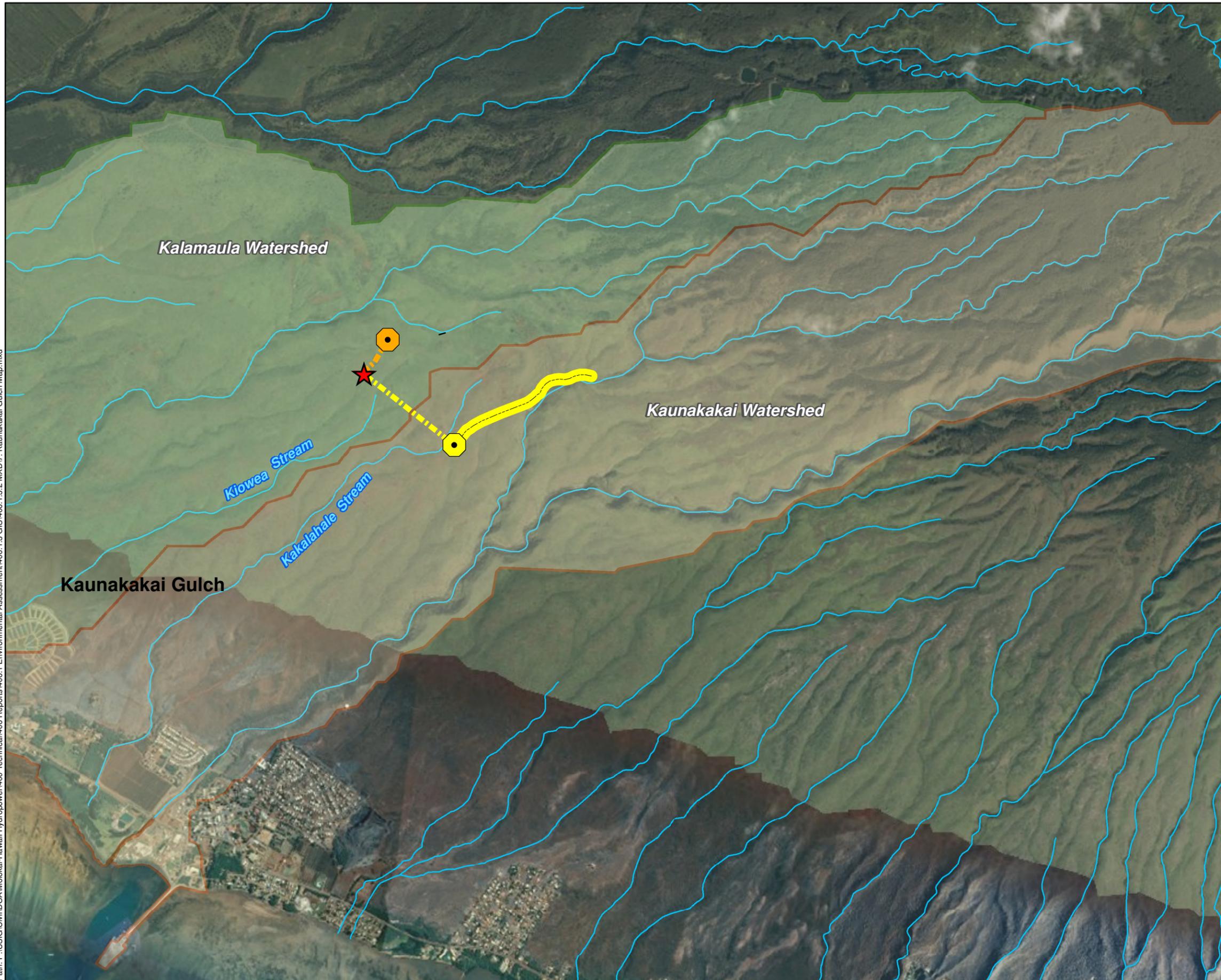
The United States Fish and Wildlife Service (USFWS) National Wetlands Inventory shows no wetlands within the project area.

3.5.3 Groundwater

Aquifers occur in the flank lavas of the volcanic domes, in rift zones characterized by dikes, on poorly permeable perching members, or within the sedimentary sequence. The aquifers of Hawai'i have been incorporated into a classification scheme determined by the Island, Sector, System, Type, and Status of aquifer. Groundwater beneath the proposed project area occurs within two aquifer systems; the Central Manawainui Aquifer with a sustainable yield of 2 MGD and the Southeast Kamiloloa Aquifer with a sustainable yield of 3 MGD as shown in Figure 6 (Mink and Lau 1992).

Central Manawainui Aquifer is classified as a basal aquifer containing freshwater in contact with seawater that is unconfined where the water table occurs in the horizontal flank lavas (Aquifer Code 40202111). The groundwater status is reported as potentially usable for drinking. The groundwater within this aquifer is described as containing water with a low salinity of 250-1000 milligrams per liter Cl⁻, and is irreplaceable with a high vulnerability to contamination (Status Code 21211).

Path: P:\USIG\Civil\DOA\Molokai-Hawaii Hydropower\400 Technical\406 Reports\406.1 Environmental Assessment\406.1.3 GIS\406.1.3.2 MXD\7. Kaunakakai Gulch Map.mxd



LOCATION MAP



LEGEND

- Watershed**
- Kalamaula Watershed
 - Kaunakakai Watershed
- Streams**
- Streams
- Proposed Hydropower Plant Installation**
- Proposed Action: Electrical Point of Connection and Relocation of Primary Meter
- Alternative 1: Connection to Existing MECO Pole**
- Proposed Power Line
 - Ownership Power Line
 - Alternative 1 Power Line

NOTES

1. Map projection: Hawaii State Plane Zone 3, NAD83
2. Aerial photo source: USGS 2006
3. Data source: <http://hawaii.gov/dbedt/gis/>

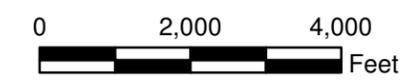
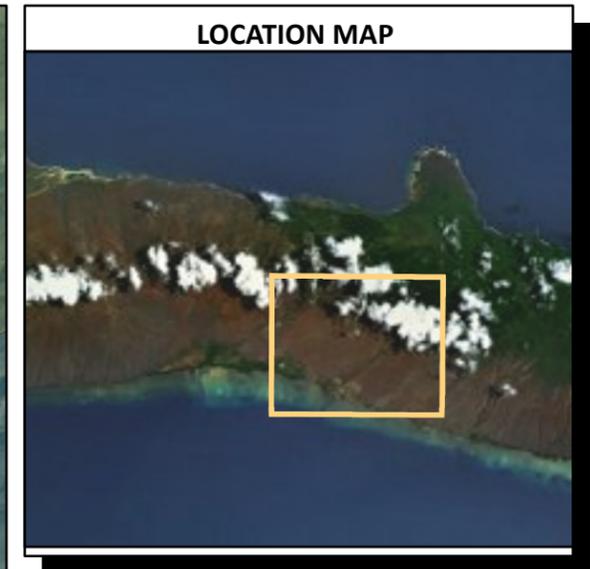


Figure 5
Kaunakakai Gulch Map
Molokai Hydropower Project
Molokai, Hawaii



LEGEND

Aquifer System

- KAMILOLOA
- KUALAPUU
- MANAWAINUI

Proposed Action:

- Proposed Hydropower Plant Installation
- Proposed Action: Electrical Point of Connection and Relocation of Primary Meter
- Alternative 1: Connection to Existing MECO Pole
- Proposed Power Line
- Ownership Power Line
- Alternative 1 Power Line

NOTES

1. Map projection: Hawaii State Plane Zone 3, NAD83
2. Aerial photo source: USGS, 2006
3. Data source: <http://hawaii.gov/dbedt/gis/>

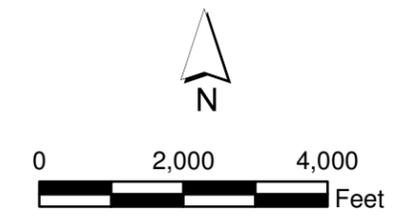


Figure 6
Molokai Aquifer System
Molokai Hydropower Project
Molokai, Hawaii

Southeast Kamiloloa Aquifer is classified as high-level, where fresh water does not come in contact with seawater and the water table is in the upper surface of the saturated aquifer on an impermeable layer (Aquifer Code 40301214). The groundwater status is reported as potentially usable for drinking. The groundwater within this aquifer is described as containing fresh water with a salinity <250 milligrams per liter Cl⁻, and is irreplaceable with a high vulnerability to contamination (Status Code 22111).

The State of Hawai'i underground injection control (UIC) program was established by the DOH Safe Drinking Water Branch to protect the quality of underground sources of drinking water. As part of this program, a UIC line was delineated on USGS maps for each island. Groundwater inland of this line is considered by the State to be a potential source of drinking water. Groundwater in areas seaward of this line are not considered potential drinking water sources.

A review of the UIC map for the Island of Moloka'i indicates the proposed project area is located above the UIC line (Figure 7).

3.5.4 Potential Impacts and Mitigation

3.5.4.1 PROPOSED ACTION

Kakalahale Stream and Kiowea Stream are located within the Proposed Project area. The installation of the new overhead pole line along the access road crosses Kakalahale Stream and is within close proximity to Kiowea Stream. The length of this power line extension from the hydroturbine facility to the electrical point of connection is approximately 3,900 ft, with power line poles installed every 200 ft. Design of power line installation would avoid placing poles in or near both Kakalahale and Kiowea Streams. There would be no permanent changes to the drainage patterns with implementation of the Proposed Action.

Construction plans and specifications for the Proposed Action would include BMPs to minimize erosion on the project site during and after construction, as well as measures to contain runoff on site during construction. Temporary erosion control measures would be used during construction to prevent soil loss and to minimize surface runoff into adjacent areas. No impacts to surface water or groundwater resources are anticipated with the implementation of the Proposed Action.

3.5.4.2 ALTERNATIVE 1

There are no lakes or streams in the project area for Alternative 1. Short-term construction-related impacts for Alternative 1 would include the installation of MECO power poles to extend approximately 1,250 ft upslope along the existing gully to the nearest point of connection. BMPs to minimize erosion and sediment runoff will be implemented during and after construction to prevent flow from entering downslope Kiowea Stream.

3.5.4.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no hydropower development measures would be implemented and there would be no change to the water resources within the project area. Therefore, no impacts to water resources are anticipated with implementation of the No-Action Alternative.

3.5.4.4 MITIGATION MEASURES

Disturbed areas would be properly managed using BMPs for erosion and sediment control. BMPs will include installation of dust control fences or silt fences, gravel berms silt barriers, filter runoff or other approved sediment trapping devices at the downstream side of the grading area and sediment pit. These measures would be installed prior to ground disturbing activities and would be inspected and maintained throughout the construction period.



LOCATION MAP



LEGEND

Underground Injection Control Line	
[White box]	Not Coded
[Brown box]	Below (makai) UIC Line
[Green box]	Above (mauka) UIC Line
[Red star]	Proposed Hydropower Plant Installation
[Yellow hexagon]	Proposed Action: Electrical Point of Connection and Relocation of Primary Meter
[Orange hexagon]	Alternative 1: Connection to Existing MECO Pole
[Yellow dashed line]	Proposed Power Line
[Yellow solid line]	Ownership Power Line
[Orange dashed line]	Alternative 1 Power Line

NOTES

- Map projection: Hawaii State Plane Zone 3, NAD83
- Aerial photo source: USGS, 2006
- Data source: <http://hawaii.gov/dbedt/gis/>
- Below (makai) UIC Line:
 - Underlying aquifer not considered drinking water source
 - Wider variety of wells allowed
 - Injection wells need UIC Permit or Permit exemption
 - Permit limitations are imposed
- Above (mauka) UIC Line:
 - Underlying aquifer considered drinking water source
 - Limited types of injection wells allowed
 - Injection wells need UIC Permit or Permit exemption
 - Permit limitations are imposed and requirements are more stringent

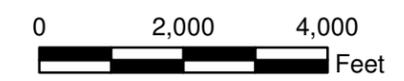


Figure 7
Molokai Underground Injection Control Map
Molokai Hydropower Project
Molokai, Hawaii

3.6 BIOLOGICAL RESOURCES

The project area is located on the lowland dry region of south central Moloka'i where the rolling terrain has been overgrazed by non-native livestock and dominated by non-native flora. A search of the USFWS online database of listed species and review of Hawai'i GIS layers for occurrences of Hawai'i listed species layers were conducted. The search concluded that no state or federal listed species, candidate species, or species otherwise determined to be rare or of special concern were observed within the proposed project area (Figure 8). A site visit conducted in January 2012 confirmed that no state or federal listed species, candidate species, rare species, species of special concern or critical habitat for these species exists within or near the proposed project area.

3.6.1 Flora

Observations identified that many grass species are present within the project area, such as Guinea grass (*Panicum maximum*), cocklebur (*Xanthium saccharatum*), and finger grass (*Chloris barbata*). Non-native Lantana (*Lantana sp.*) and kiawe trees (*Prosopis pallida*) are also present. Brushfires are a common occurrence on Moloka'i, and as a result the proposed project area has new growth and numerous trees and shrubs with fire scars. No flora listed as Threatened, Endangered or Species of Concern by the State of Hawai'i or by any federal jurisdictional agency was observed during the site visit (Figure 9).

3.6.2 Fauna

The site visit identified one terrestrial fauna species within the proposed project area: California Quail (*Callipepla californica*), as well as a swarm of an unknown species of wasp. Avifauna and mammals common to the Project site and surrounding areas include non-native cattle, deer, mongoose, rat, and wild pig. No fauna including seabirds, waterbirds, or terrestrial fauna listed as Threatened, Engangered, or Species of Special Concern by the State of Hawai'i or by any federal jurisdictional agency were observed during the site visit (Figure 10).

3.6.3 Potential Impacts and Mitigation

3.6.3.1 PROPOSED ACTION

Only short-term construction-related impacts to biological resources are anticipated with implementation of the Proposed Action. The Proposed Action would include minor grading of the land to prepare for installation of the concrete slab, turbine, above ground pipe and power line poles. No rare botanical species or species listed as endangered or threatened by the State of Hawai'i or the USFWS have been identified within the project area. Likewise, no areas of Critical Habitat have been determined on or within close proximity to the project area. Therefore, no significant adverse impacts to biological resources are anticipated.

3.6.3.2 ALTERNATIVE 1

The Alternative 1 power line alignment was not identified at the time of the January 2012 site walk. Should Alternative 1 become the recommended alignment to proceed in completing the purpose of this project, it is recommended that an additional site walk take place along the alternative power line alignment. However, due to the similar vegetation and topography as the Proposed Action project area, no significant adverse impacts to biological resources are anticipated in the Alternative 1 project area.

3.6.3.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no hydropower development measures would be installed. There would be no impacts to biological resources under the No-Action Alternative.

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Canavalia molokaiensis

Cyanea mannii

Melicope mucronulata

Cyanea dunbarii

Melicope mucronulata

Alectryon macrococcus var. *macrococcus*

Melicope mucronulata

Canavalia molokaiensis

Silene alexandri
Schiedea sarmentosa

Mariscus fauriei

Silene alexandri

Hibiscus brackenridgei
Isodendron pyriformis
Sesbania tomentosa

LOCATION MAP



LEGEND

- Critical Habitats for Molokai Moths
- Critical Habitats for Molokai Plants
- Proposed Hydropower Plant Installation
- Proposed Action:
- Electrical Point of Connection and Relocation of Primary Meter
- Alternative 1:
- Proposed Power Line
- Ownership Power Line
- Alternative 1 Power Line

NOTES

1. Map projection: Hawaii State Plane Zone 3, NAD83
2. Aerial photo source: USGS 2006
3. Data source: <http://hawaii.gov/dbedt/gis/>
4. **Scientific Name:** Moth species
5. **Scientific Name:** Plant species

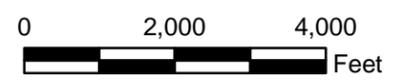
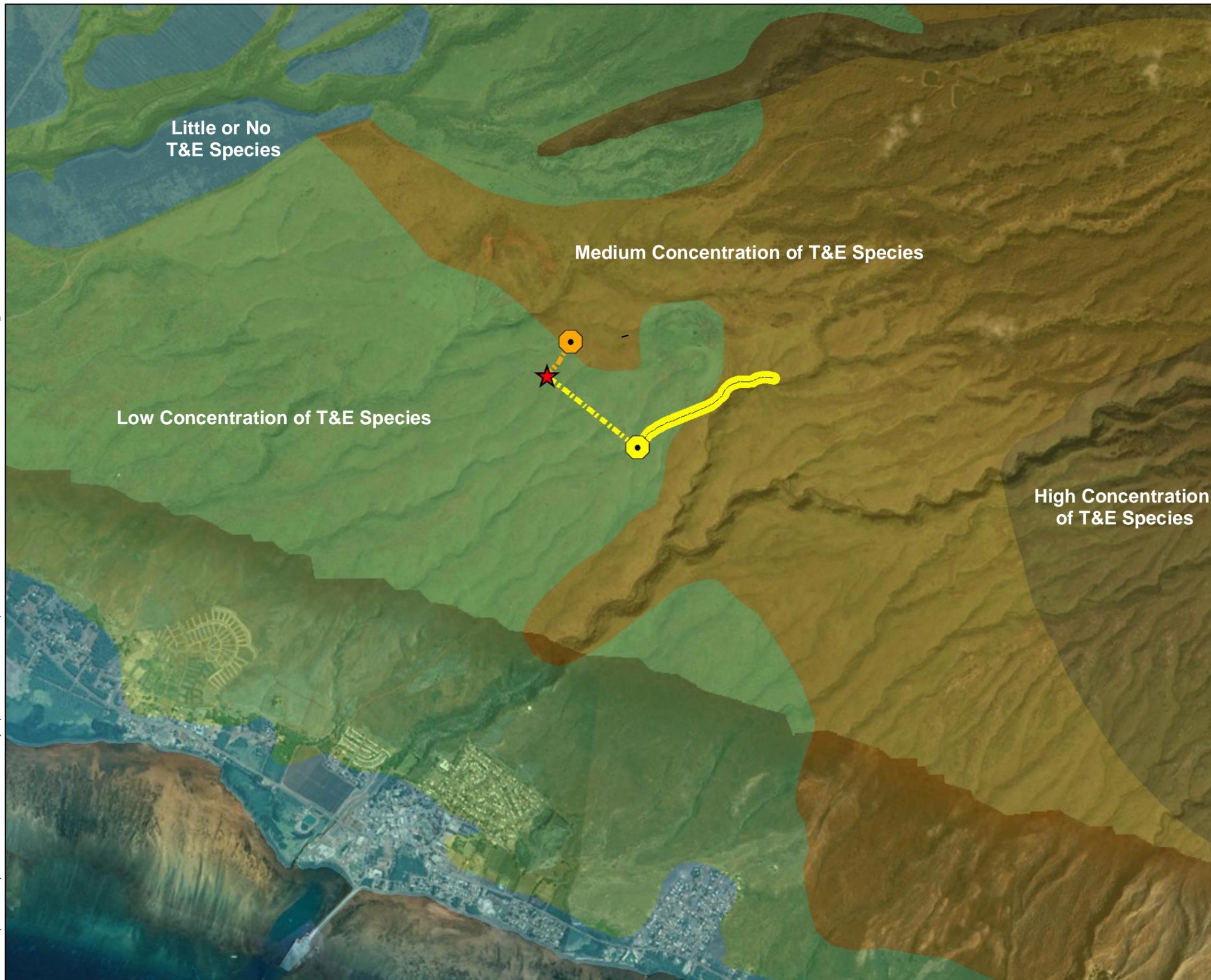


Figure 8
Molokai Critical Habitats Map
Molokai Hydropower Project
Molokai, Hawaii

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LOCATION MAP



LEGEND

- Threatened & Endangered Flora Density**
- Little or no T&E species
 - Low concentration of T&E species
 - Medium concentration of T&E species
 - High concentration of T&E species
 - Very high concentration of T&E species
- Proposed Hydropower Plant Installation**
- Proposed Action:**
- ⊗ Electrical Point of Connection and Relocation of Primary Meter
 - ⊗ Alternative 1: Connection to Existing MECO Pole
 - Proposed Power Line
 - Ownership Power Line
 - Alternative 1 Power Line

NOTES

1. Map projection: Hawaii State Plane Zone 3, NAD83
2. Aerial photo source: USGS, 2006
3. Data source: <http://hawaii.gov/dbedt/gis/>
4. T&E - Threatened & Endangered

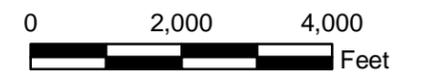
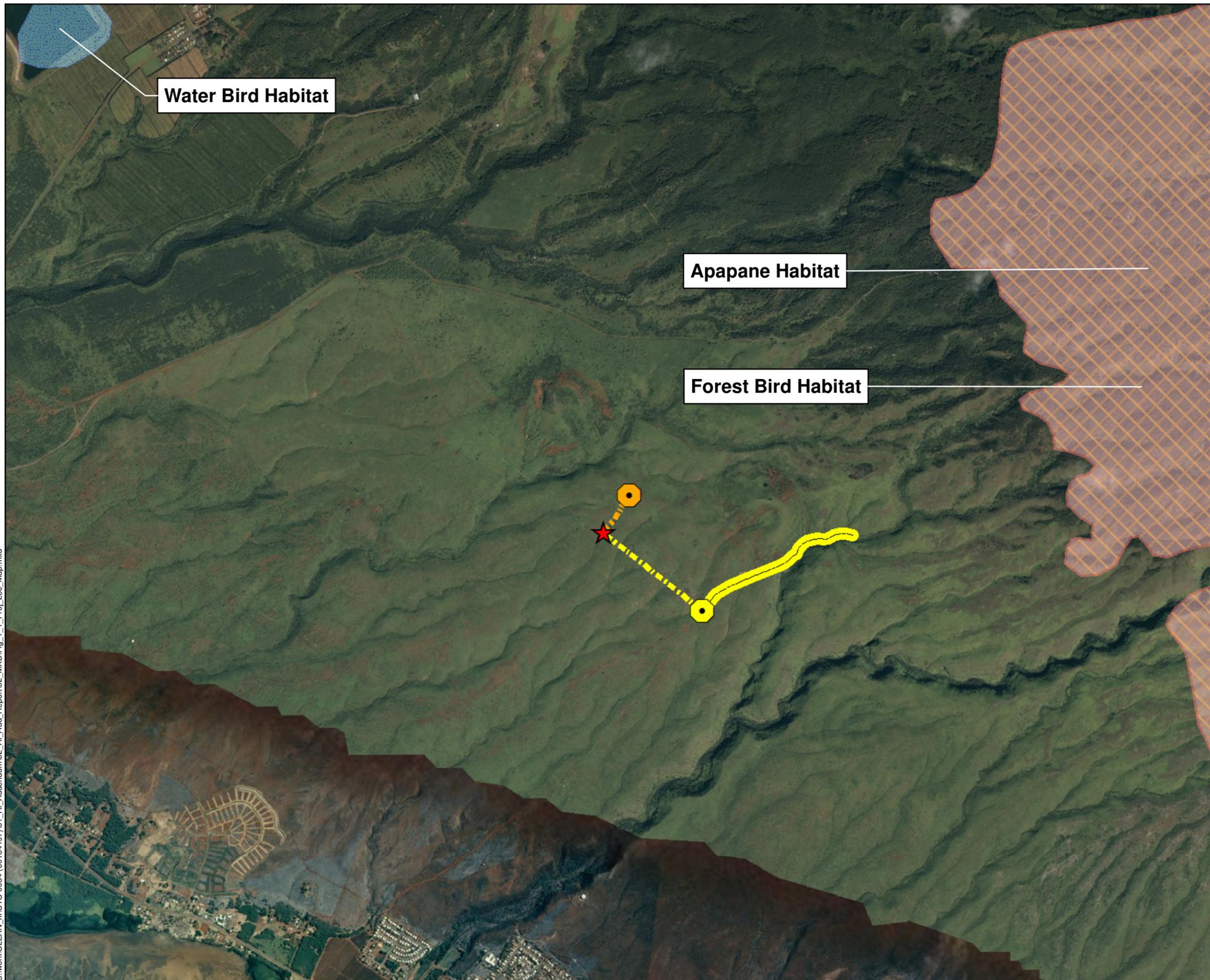


Figure 9
Threatened & Endangered Flora Density
Molokai Hydropower Project
Molokai, Hawaii

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Legend

- Forest Bird Habitat
- Apapane Habitat
- Water Bird Habitat
- Proposed Hydropower Plant Installation
- Proposed Action: Electrical Point of Connection and Relocation of Primary Meter
- Alternative 1: Connection to Existing MECO Pole
- Proposed Power Line
- Ownership Power Line
- Alternative 1 Power Line

Notes

1. Map projection: Hawaii State Plane Zone 3, NAD83
2. Aerial photo source: USGS, 2006
3. Data source: <http://hawaii.gov/dbedt/gis/>

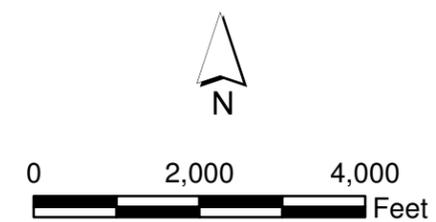


Figure 10
Threatened & Endangered Fauna Map
Molokai Hydropower Project
Molokai, Hawaii

3.6.3.4 MITIGATION MEASURES

Site-specific BMPs to control erosion and other pollutants, including filter socks, catch basin filter, and drain inlet protection, would be installed before construction. The BMPs would be maintained throughout the entire construction period. The contractor would be responsible for inspecting the BMPs weekly and repairing as necessary.

3.7 CULTURAL RESOURCES

During the pre-contact era, the Moloka'i population base was primarily concentrated at the island's windward coasts. The area was rich in ocean resources and the deep valleys with perennial streams supported a lifestyle based on subsistence agriculture, primarily associated with intensive taro production. The onset of western contact resulted in a reduced reliance on subsistence agriculture and increased dependence on a plantation and ranching-based economy. Herd animals (e.g., cattle, sheep, deer, goat, and horse) were introduced and had a notably adverse impact on the landscape due to their grazing (Wiesler and Kirch 1982). The Moloka'i Ranch was founded at the end of the century, purchasing lands formerly owned by Kamehameha V.

According to traditional Hawai'ian burial beliefs, following death, the *uhane*, or spirit, must remain near *na iwi*, or bones. Burial sites are chosen by Hawai'ians for symbolic purposes in places for safekeeping. Today, federal and state laws protect both marked and unmarked burial sites.

3.7.1 Potential Impacts and Mitigation

3.7.1.1 PROPOSED ACTION

No surface historic properties were observed within the Project area. Consultation with the State Historic Preservation Division was initiated on 9 March 2012, and is currently under review with the consulting archaeologists at Maui Archaeology to determine the appropriate scope of work to complete the Project's historic preservation review process.

3.7.1.2 ALTERNATIVE 1

Same as Proposed Action.

3.7.1.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no work would be performed at the project site. No impacts to cultural resources would occur with implementation of the No-Action Alternative.

3.7.1.4 MITIGATION MEASURES

Should site work uncover subsurface features, work in the immediate area would cease and the State Historic Preservation Division and Maui Archaeology would be contacted for establishment of appropriate mitigation measures in accordance with Chapter 6E, Hawai'i Revised Statutes.

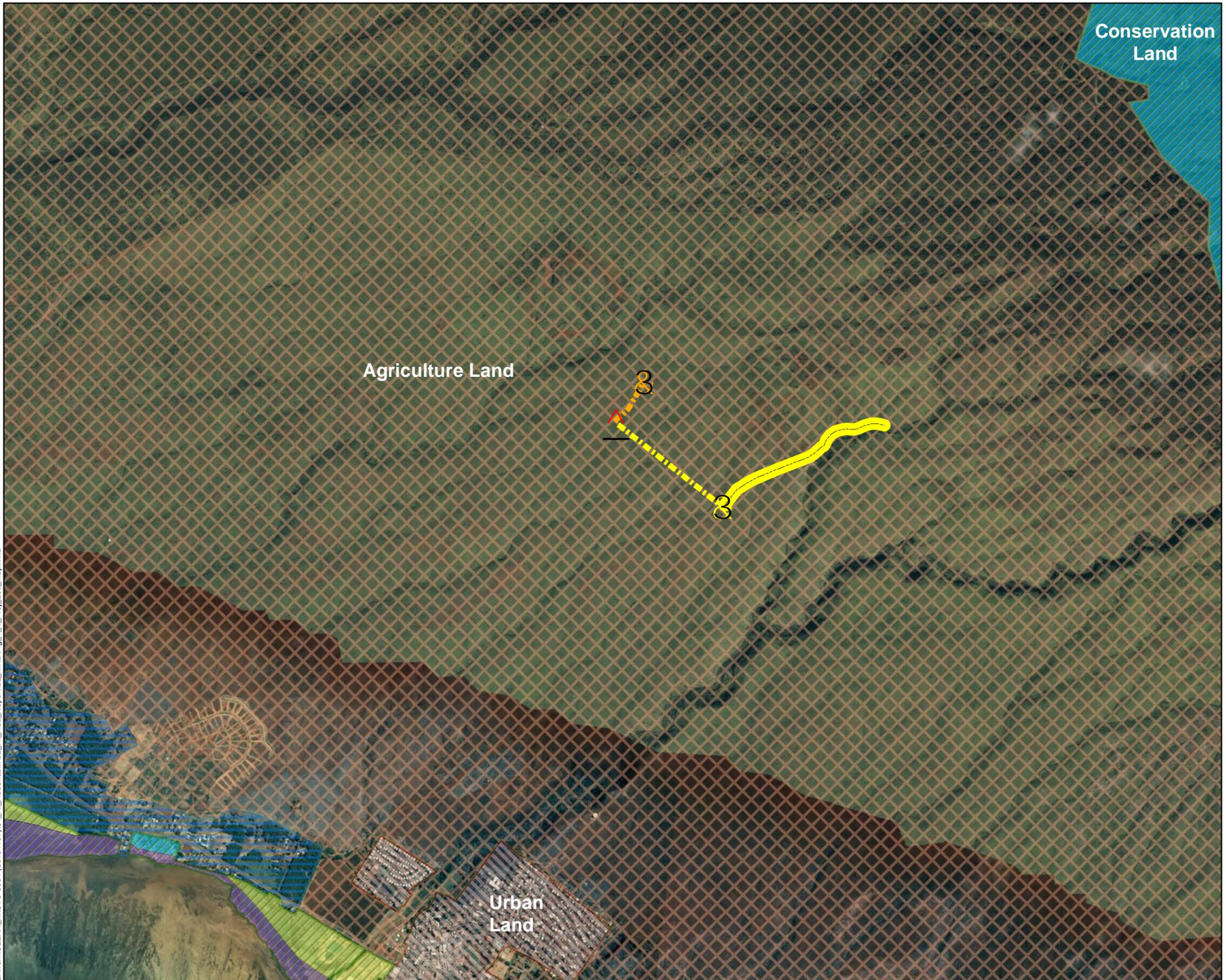
3.8 LAND USE AND OWNERSHIP

3.8.1 Existing Land Use and Ownership

The State of Hawai'i Land Use Commission designated the area adjacent to the proposed project area as Agriculture Land Use - *This use indicates areas for agricultural activity which would be in keeping with the economic base of the County and the requirements and procedures of Chapter 205 HRS, as amended.* The ALUM has designated this agricultural land as grazing land. No Conservation Districts and no ALISH lands exist in close proximity to the project area (Figure 11).

The proposed project area is located on Moloka'i Ranch with entry and exit to the site crossing over lands owned by the Department of Hawai'ian Homelands (Figure 12).

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Legend

State Land Use District	Conservation District
Agricultural	General Subzone
Conservation	Limited Subzone
Rural	Resource Subzone
Urban	

- Proposed Hydropower Plant Installation
- Proposed Action: Electrical Point of Connection and Relocation of Primary Meter
- Alternative 1: Connection to Existing MECO Pole
- Proposed Power Line
- Ownership Power Line
- Alternative 1 Power Line

Notes

1. Map projection: Hawaii State Plane Zone 3, NAD83
2. Aerial photo source: USGS, 2006
3. Data source: <http://hawaii.gov/dbedt/gis/>

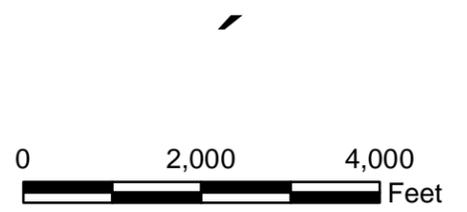
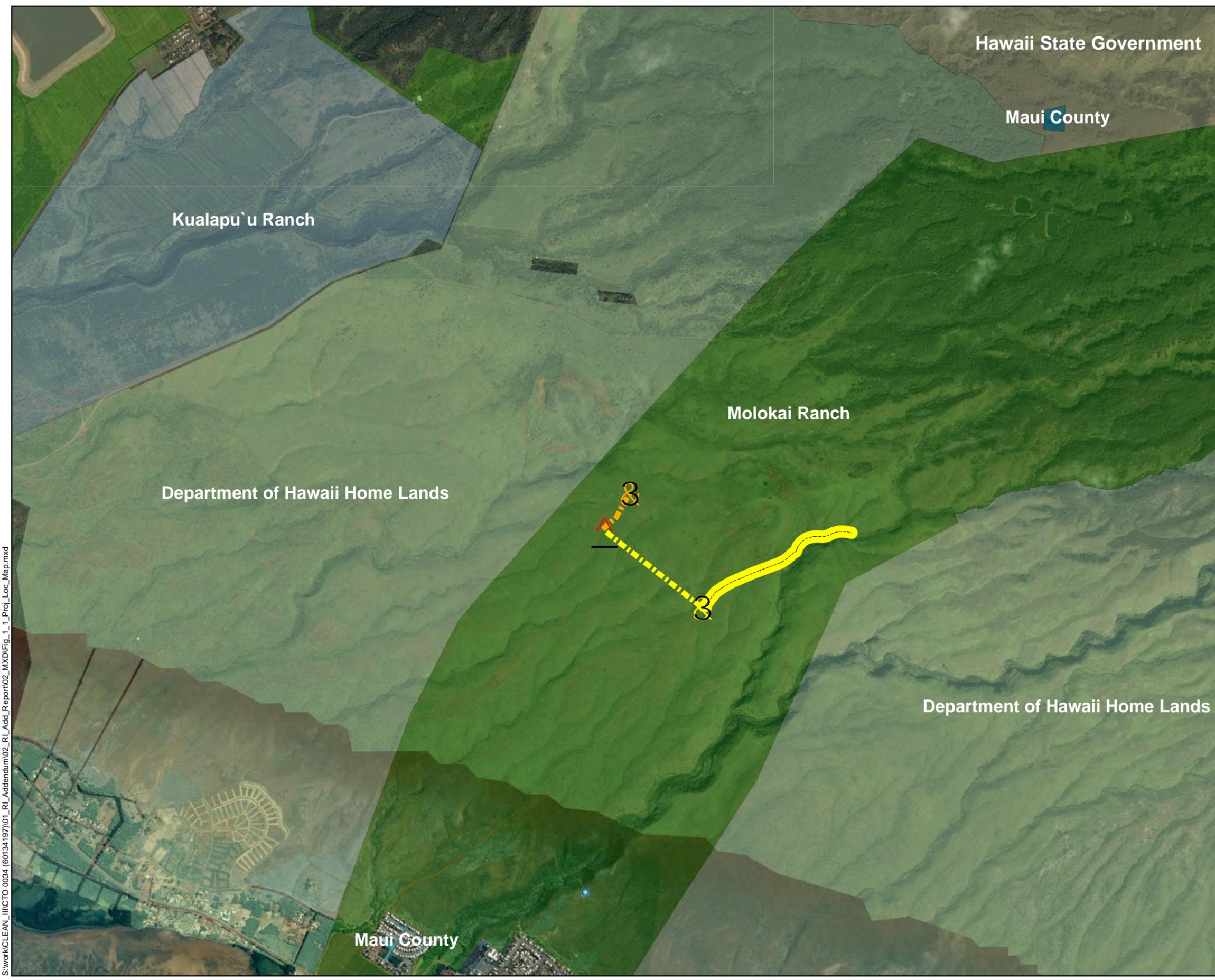


Figure 11
State Land Use District and
Conservation District Subzone Map
Molokai Hydropower Project
Molokai, Hawaii



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Legend

Major Land Owner

- Molokai Ranch
- Hawaii State Government
- Department of Hawaii Home Lands
- Maui County
- Kualapuu Ranch

Proposed Action:

- Alternative 1: Connection to Existing MECO Pole
- Proposed Power Line
- Ownership Power Line
- Alternative 1 Power Line

Proposed Hydropower Plant Installation:

- Proposed Hydropower Plant Installation

Electrical Point of Connection and Relocation of Primary Meter:

- Electrical Point of Connection and Relocation of Primary Meter

Notes

1. Map projection: Hawaii State Plane Zone 3, NAD83
2. Aerial photo source: USGS, 2006
3. Data source: <http://hawaii.gov/dbedt/gis/>

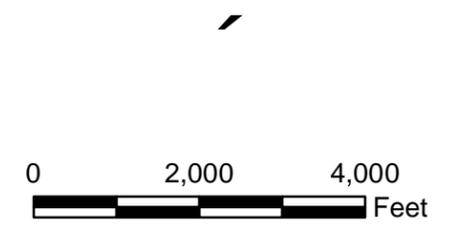


Figure 12
Land Ownership Zone Map
Molokai Hydropower Project
Molokai, Hawaii

3.8.2 Potential Impacts and Mitigation

3.8.2.1 PROPOSED ACTION

Implementation of the Proposed Action would result in no change to land use or ownership within the project area. However, the segment of the power line extension to the nearest existing MECO pole northeast of the hydropower site location will require additional easement acquisition.

3.8.2.2 ALTERNATIVE 1

Alternative 1 would result in a transfer of ownership of the existing power line located along the access road that leads to West Portal from MECO to DOA. The majority of Alternative 1 would be completed within the existing MIS easement.

3.8.2.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no work would be performed at the project site. Existing land use and ownership would remain; therefore, no impacts to land use and ownership would occur with the No-Action Alternative.

3.8.2.4 MITIGATION MEASURES

No impacts are expected from this resource; thus, no mitigation measures would be required.

3.9 VISUAL RESOURCES

Visual resources are the aggregate of characteristic features imparting visually aesthetic qualities to a natural, rural, or urban environment. The visual resources for the proposed project area include the viewsheds from the main scenic highways, Mauna Loa Highway and Kamehameha V Highway, approximately 3 miles downslope, and the housing developments of Kaunakakai.

3.9.1 Existing Scenic and Visual Environment

The proposed project area is on grazing lands of Moloka'i Ranch. The terrain consists of rolling hills covered with native and invasive vegetation that averages a height of 5 ft and below with occasional shrubs and trees exceeding that height within the drainage features. The proposed project is located along the existing MIS water line and access road that was completed in 1968.

3.9.2 Potential Impacts and Mitigation

3.9.2.1 PROPOSED ACTION

The proposed action is not anticipated to have a substantial, adverse impact to existing views.

3.9.2.2 ALTERNATIVE 1

Same as Proposed Action.

3.9.2.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no work would be performed at the project site. No impacts to visual resources would occur with implementation of the No-Action Alternative.

3.9.2.4 MITIGATION MEASURES

No impacts are expected from this resource, thus no mitigation measures would be required.

3.10 NATURAL HAZARDS

Natural hazards that may occur in and affect the proposed project area include floods, tsunamis, hurricanes, earthquakes, flooding, and other natural events.

3.10.1 Floods

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) flood zone designations are:

- A – Areas of 100-year flood, base flood elevations not determined
- AE – Areas of 100-year flood, base flood elevations determined
- XS – Areas of 500 year flood; areas of 100-year flood with average depths of less than one foot or within the drainage area less than one square mile, and areas protected by levees from 100-year flood
- X – Areas determined to be outside the 500-year flood plain
- D – Areas in which flood hazard is undetermined
- VE – Areas of 100-year coastal flood with velocity (wave action), base flood elevations determined (Coastal High Hazard District)

The FEMA FIRM Community Panel 150030190E, revised September 25, 2009, shows the project site is in Zone X (Figure 13), which means that it is outside of the 500-year floodplain.

3.10.2 Tsunamis

Tsunamis are a series of destructive ocean waves generated by seismic activity that could affect shorelines of Hawai'i. Tsunamis affecting Hawai'i are typically generated in the waters off South America, the west coast of the United States, Alaska, and Japan. Local tsunamis have also been generated by seismic activity on the Island of Hawai'i.

The County of Maui Civil Defense Agency establishes tsunami evacuation zones and maps for all coastal areas on Moloka'i. The project area is not within a tsunami evacuation zone (Maui 2012).

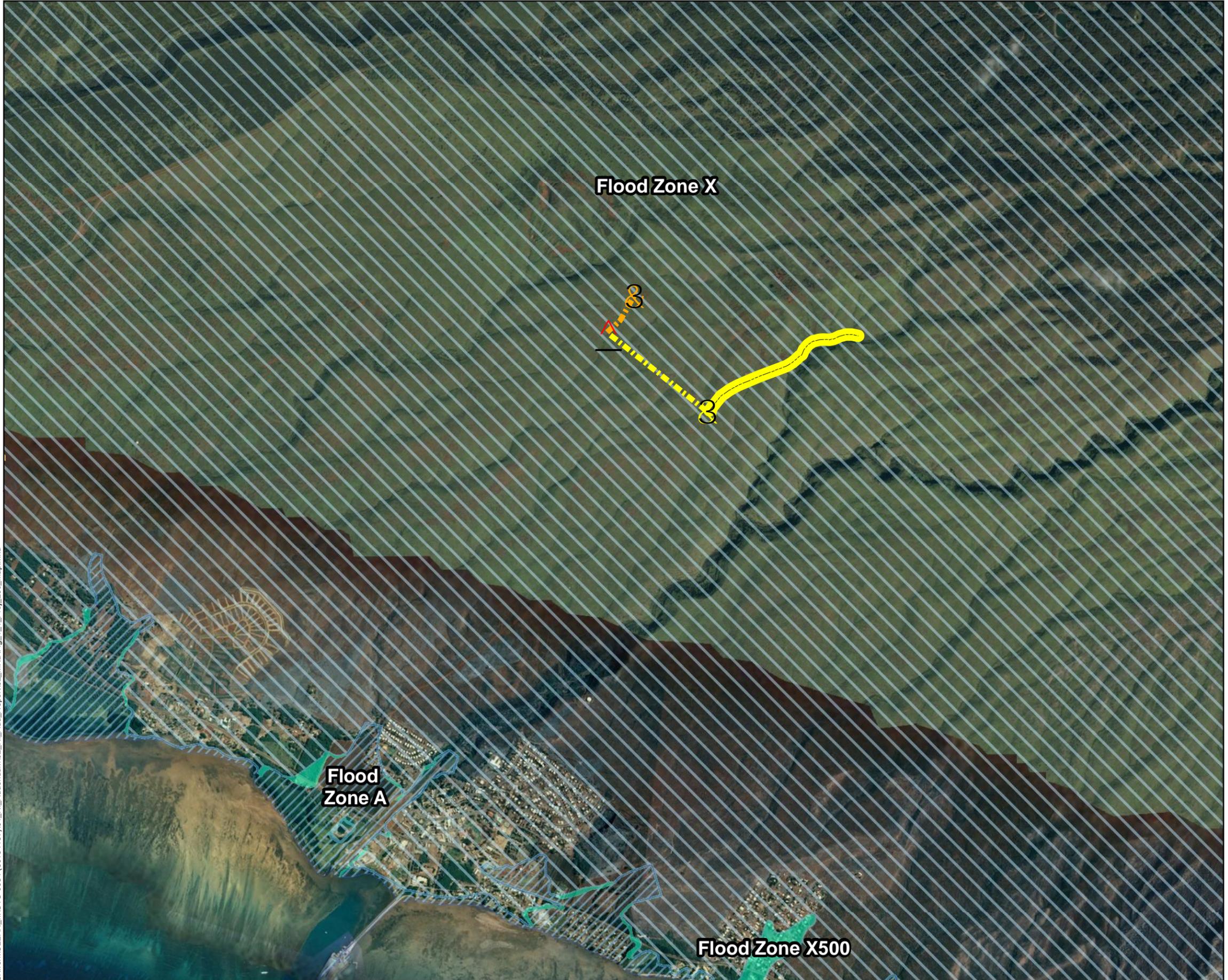
3.10.3 Hurricanes

The Hawai'ian Islands are seasonally affected by Pacific hurricanes from June to November. These storms generally travel toward the islands from a southerly or southeasterly direction and can deposit large amounts of rain with high winds on the Hawai'ian Islands. The storms generally contribute to localized flooding and coastal storm surges. Coastal storm surges would not impact the proposed project area.

3.10.4 Earthquakes

Seismic activity usually occurs on the Island of Hawai'i, and has been felt as far away as Moloka'i. Moloka'i is listed in Seismic Zone 2B under the Uniform Building Code (USGS 1998). Zone 2B indicates a location that has moderate to severe potential for ground motion created by seismic activity.

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Legend

Flood Hazard Zone

- X - Areas outside the 500-year flood plain
- A - Areas of 100-year flood
- X500 - 500-year flood plain

Proposed Hydropower Plant Installation

Proposed Action:

- Electrical Point of Connection and Relocation of Primary Meter
- Alternative 1: Connection to Existing MECO Pole
- Proposed Power Line
- Ownership Power Line
- Alternative 1 Power Line

Notes

1. Map projection: Hawaii State Plane Zone 3, NAD83
2. Aerial photo source: USGS, 2006
3. Data source: <http://hawaii.gov/dbedt/gis/>
4. FEMA: Federal Emergency Management Agency

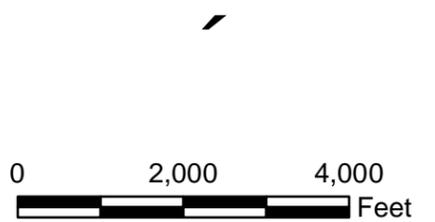


Figure 13
FEMA Flood Hazard Zone Map
Molokai Hydropower Project
Molokai, Hawaii

3.10.5 Potential Impacts and Mitigation

3.10.5.1 PROPOSED ACTION

Heavy rainfall associated with tropical storms has the potential to initiate soil erosion in the project area.

Tsunami and flooding in the project area are unlikely due to its elevation, upslope site location, and the well-drained soils in the project area. The project is not expected to be adversely effected by flooding.

Earthquakes can pose a threat to unstable slopes, but disruptive seismic events are relatively uncommon in this region. The contractor would exercise caution at the worksite should an advance warning from the State and County civil defense agencies be issued.

3.10.5.2 ALTERNATIVE 1

Portions of Alternative 1 may be constructed near, through, or along a steep ravine. Rapid surface water runoff due to heavy rainfall would accelerate soil erosion that may increase the potential of rockfall or landslides along the Alternative 1 area. The same precautionary efforts would be implemented as stated in the Proposed Action.

3.10.5.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no hydropower installation would be implemented and the existing irrigation system and diesel generated sources of power would remain. The No-Action Alternative would have no impact at the project site relative to natural hazards.

3.10.5.4 MITIGATION MEASURES

Construction activities would be short-term and would include the appropriate measures to reduce the possibility of contributing to any potential natural hazards. Attention would be paid to approaching weather systems to provide proper stormwater runoff measures due to heavy rainfall. Where necessary, silt fencing will be installed to prevent further soil erosion as a result of construction activities. No further mitigation measures are proposed.

3.11 HAZARDOUS MATERIALS AND HAZARDOUS WASTE

For the purpose of the following analysis, the term hazardous materials or hazardous wastes refers to those substances defined by the Comprehensive Environmental Response, Compensation, and Liability Act.

The proposed project site is undeveloped. A visual survey of the project site shows no evidence of previous structures, buildings, facilities, or underground storage tanks that might contain hazardous materials.

3.11.1 Potential Impacts and Mitigation

3.11.1.1 PROPOSED ACTION

Construction equipment and vehicles contain hazardous materials such as gasoline, diesel, oil, and hydraulic and brake fluids. Accidental release of these materials into the environment is possible, but not anticipated. Material management practices would be used to reduce the risk of spills or other accidental release of materials and substances into the environment.

No significant impacts related to hazardous materials or hazardous wastes are anticipated with implementation of the Proposed Action.

3.11.1.2 ALTERNATIVE 1

Same as Proposed Action.

3.11.1.3 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, no construction activities would occur at the project site, and no hazardous materials would be brought to the project area. Therefore, no impacts from hazardous materials are anticipated with the No-Action Alternative.

3.11.1.4 MITIGATION MEASURES

Site-specific BMPs, including procedures for hazardous material storage, handling, and staging; spill prevention, control, and response; waste disposal; and good housekeeping would be developed and implemented by the construction contractor. These BMPs would greatly reduce the likelihood of hazardous materials being released into the environment. The construction contractor would be responsible for compliance with all applicable federal, state, and local regulations governing the transportation, use, storage, and/or disposal of hazardous material and hazardous wastes during construction.

3.12 PUBLIC FACILITIES AND SERVICES

3.12.1 Recreational Areas

The proposed project area is located on Moloka'i Ranch in an enclosed portion that is utilized for livestock grazing and is not open to the public for recreation trails. The Na Ala Hele Trails and the Moloka'i Forest Reserve (Figure 14) are not within close proximity to the proposed project site.

3.12.2 Transportation and Traffic

The proposed project site is located along a dirt road approximately 3 miles uphill from the nearest community of Kaunakakai. Access to the proposed project site is monitored by two separate locked gates that do not allow public admittance.

3.12.3 Utilities and Infrastructure

The utilities and infrastructure located within the proposed project area include the MIS pipes and MECO transmission lines and poles.

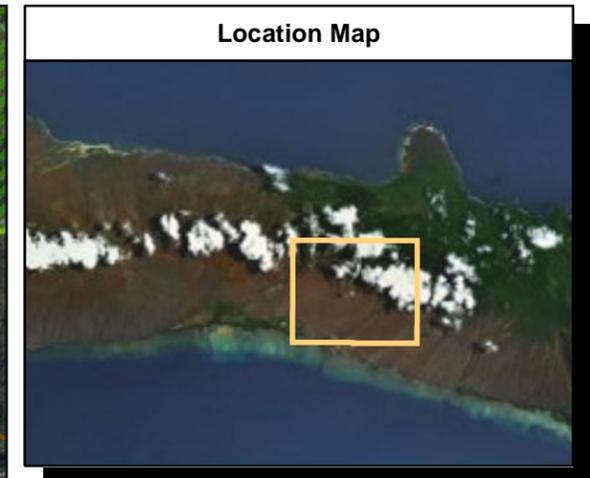
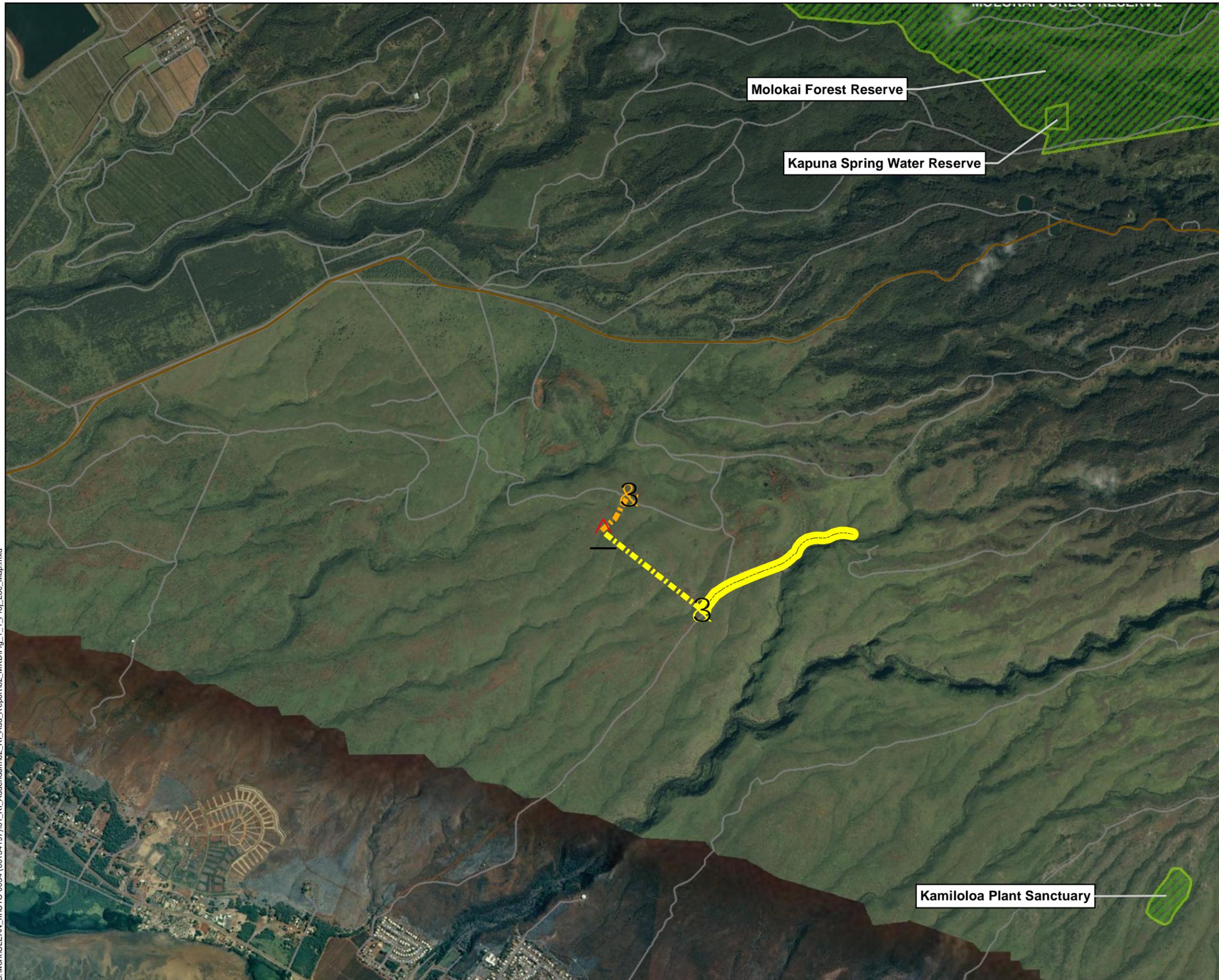
No impacts to sanitary sewer systems, storm water discharges, and solid waste disposal would occur.

3.12.4 Emergency Services

The proposed project area is located approximately 3 miles uphill from the nearest community of Kaunakakai and would not impede on regular emergency services routes due to its remote location. Should an emergency occur at the proposed project site, access through the two locked gates would be allowed.

Police services for the area are provided by the Moloka'i Police Department's Kaunakakai Headquarters. Fire protection is provided by the Moloka'i Fire Department's Kaunakakai Station. Ambulance service is provided by American Medical Response Moloka'i Division in Kaunakakai.

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Legend

- Hiking Trails
- Roads
- Reserves
- Proposed Hydropower Plant Installation
- Proposed Action: Electrical Point of Connection and Relocation of Primary Meter
- Alternative 1: Connection to Existing MECO Pole
- Proposed Power Line
- Ownership Power Line
- Alternative 1 Power Line

Notes

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3. Data source: <http://hawaii.gov/dbedt/gis/>

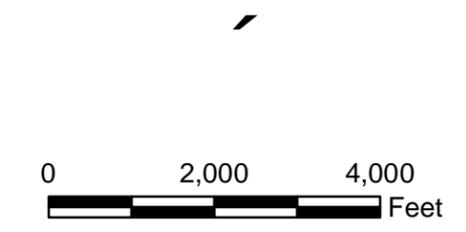


Figure 14
Forest and Recreation Areas Map
Molokai Hydropower Project
Molokai, Hawaii

3.12.5 Potential Impacts and Mitigation

3.12.5.1 PROPOSED ACTION

The Proposed Action would not impact or close any recreational areas or roadways. It would not generate any new demand for police, fire, or ambulance services. During construction, however, these services may be required in the event of an injury or construction accident. This potential use for such services is not expected to result in the requirement for new personnel or for construction of new police, fire, or ambulance facilities.

3.12.5.2 ALTERNATIVE 1

Same as Proposed Action.

3.12.5.3 NO-ACTION ALTERNATIVE

No impacts to recreational areas, transportation, traffic, utilities, infrastructure, or emergency services are anticipated with implementation of the No-Action Alternative.

3.12.5.4 MITIGATION MEASURES

No impacts are expected from this resource, thus no mitigation measures would be required.

3.13 SOCIOECONOMICS

This section summarizes the demographic and income characteristics of residents near the proposed project area. Census data are used to describe the existing social and economic characteristics of project area and to determine whether any minority or low-income population may experience disproportionately high adverse impact from the Proposed Action or alternatives.

The project area is located within Census Tract 317 and is represented in Figure 15. Data summarized in Table 3-2 and Figure 15 are taken from the 2010 U.S. Census and (U.S. Census Bureau 2010). The socioeconomics for the County of Maui is presented for reference.

Table 3-2: Population and Demographics

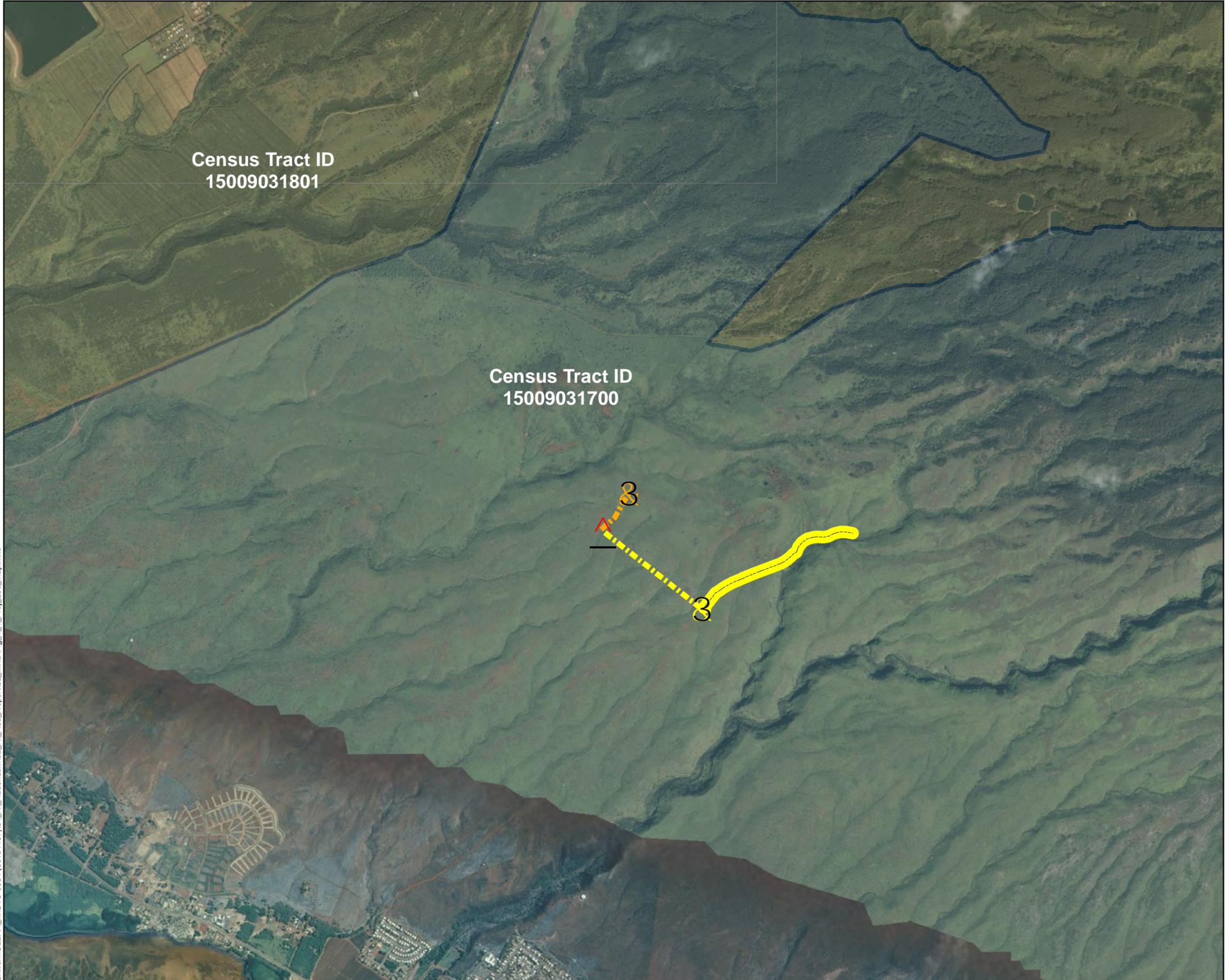
Characteristic	County of Maui		Moloka'i Census Tract 317	
	no.	Percent	no.	Percent
Population	154,834	100.0	4503	100.0
Ethnicity				
White	53,336	34.4	784	17.4
Black or African American	870	0.5	19	0.4
American Indian or Alaska Native	603	0.3	15	0.3
Asian	44,595	28.8	804	17.8
Native Hawai'ian and Other Pacific Islander	16,051	10.3	1,103	24.4
Some Other Race	3,051	1.9	12	0.2
Two or More Races	36,328	23.4	1,766	39.2
Median Household Income (1999)	\$60,502	—	\$42,053	—

Notes:

no. = number

Source: U.S. Census Bureau 2010.

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Legend

Census Tract ID

- 15009031700
- 15009031801

▲ Proposed Hydropower Plant Installation

Proposed Action:

- ⌘ Electrical Point of Connection and Relocation of Primary Meter
- ⌘ Alternative 1: Connection to Existing MECO Pole

Proposed Power Line

Ownership Power Line

Alternative 1 Power Line

Notes

1. Map projection: Hawaii State Plane Zone 3, NAD83
2. Aerial photo source: USGS, 2006
3. Data source: <http://hawaii.gov/dbedt/gis/>

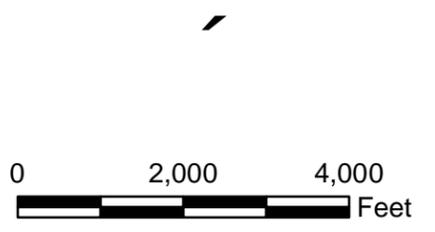


Figure 15
2010 Census Tracts Map
Molokai Hydropower Project
Molokai, Hawaii

3.13.1 Potential Impacts and Mitigation

3.13.1.1 PROPOSED ACTION

No socioeconomic impacts are expected with implementation of the Proposed Action because the Proposed Action would not impact employment, income, or demographics within the project area.

3.13.1.2 ALTERNATIVE 1

No socioeconomic impacts are expected with implementation of Alternative 1 because Alternative 1 would not impact employment, income, or demographics within the project area.

3.13.1.3 NO-ACTION ALTERNATIVE

No socioeconomic impacts are expected with implementation of the No-Action Alternative because the No-Action Alternative would not impact employment, income, or demographics within the project area.

3.13.1.4 MITIGATION MEASURES

No impacts are expected from this resource, thus no mitigation measures would be required.

3.14 CUMULATIVE IMPACTS

Cumulative impacts refer to impacts on the environment that result from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such actions. Cumulative impacts can result from individually minor yet collectively significant actions taking place over a period of time. Land use in the proposed project vicinity is comprised of agriculture land. No other past, present, or planned actions associated with these land uses have been identified that would contribute to cumulative impacts for any resources. Therefore, no significant cumulative impacts would be anticipated from implementation of the Proposed Action or the No-Action Alternative.

3.15 IRRETRIEVABLE AND IRREVERSIBLE COMMITMENT OF RESOURCES

Implementation of the Proposed Action would not result in an irreversible or irretrievable commitment of resource, except for financial resources, fuel, or other consumable materials required for construction.

4.0 RELATIONSHIP TO STATE AND COUNTY LAND USE PLANS AND POLICIES

4.1 STATE PLANNING DOCUMENTS

4.1.1 Hawai'i State Plan

The Hawai'i State Plan, Chapter 226 of HRS, adopted in 1978 and revised in 1988, establishes the overall theme, goals, objectives, and priority guidelines to guide the future long-range development of the State (Department of Planning and Economic Development 1978).

The proposed project supports and is consistent with the following State Plan objectives and policies:

Section 226-10: Objective and policies for the economy – potential growth activities.

- (a) Planning for the State's economy with regard to the potential growth activities shall be directed towards achievement of the objective of development and expansion of potential growth activities that serve to increase and diversify Hawai'i's economic base.
- (b) To achieve the potential growth activity objective:
 - 4. Accelerate research and development of new energy-related industries based on wind, solar, ocean and underground resources, and solid waste

Section 226-13: Objectives and policies for the physical environment-land, air, and water quality.

- (a) Planning for the State's physical environment with regards to land, air, and water quality shall be directed towards achievement of the following objectives:
 - 1. Maintenance and pursuit of improved quality in Hawai'i's land, air, and water resources.
 - 2. Promote the proper management of Hawai'i's land and water resources.
- (b) To achieve the land, air, and water quality objectives, it shall be the policy of this State to:
 - 2. Promote the proper management of Hawai'i's land and water resources.
 - 3. Promote effective measures to achieve desired quality in Hawai'i's surface, ground, and coastal waters.

Section 226-14: Objectives and policies for facility systems – in general.

- (a) Planning for the State's facility systems in general shall be directed towards achievement of the objective of water, transportation, waste disposal, and energy and telecommunication systems that support statewide social, economic, and physical objectives.
- (b) To achieve the general facility systems objective, it shall be the policy of this State to:
 - 2. Encourage flexibility in the design and development of facility systems to promote prudent use of resources and accommodate changing public demands and priorities.
 - 3. Ensure that required facility systems can be supported within resource capacities and at reasonable cost to the user.
 - 4. Pursue alternative methods of financing programs and projects and cost-saving techniques in the planning, construction, and maintenance of facility systems.

Section 226-18: Objectives and policies for facility systems – energy.

- (a) Planning for the State's facility systems with regard to energy shall be directed toward the achievement of the following objectives, giving due consideration to all:
 - 1. Dependable, efficient, and economical statewide energy systems capable of supporting the needs of the people;
 - 2. Increased energy self-sufficiency where the ratio of indigenous to imported energy use is increased;
- (b) To achieve the energy objectives, it shall be the policy of this State to ensure the short- and long-term provision of adequate, reasonably priced, and dependable energy services to accommodate demand.
- (c) To further achieve the energy objectives, it shall be the policy of this State to:
 - 1. Support research and development as well as promote the use of renewable energy sources;
 - 2. Ensure that the combination of energy supplies and energy-saving systems is sufficient to support the demands of growth;

3. Base decisions of least-cost supply-side and demand-side energy resource options on a comparison of their total costs and benefits when a least-cost is determined by a reasonably comprehensive, quantitative, and qualitative accounting of their long-term, direct and indirect economic, environmental, social, cultural, and public health costs and benefits;
4. Promote all cost-effective conservation of power and fuel supplies through measures, including:
 - A. Development of cost-effective demand-side management programs;
 - C. Adoption of energy-efficient practices and technologies;
5. Ensure, to the extent that new supply-side resources are needed, that the development or expansion of energy systems uses the least-cost energy supply option and maximizes efficient technologies;
6. Support research, development, demonstration, and use of energy efficiency, load management, and other demand-side management programs, practices, and technologies.

4.1.2 State Functional Plans

The State Functional Plans are designed to implement the broader goals, objectives, and policies of the State Plan through specific actions identified as Implementing Actions (IA). While the proposed project is not specifically identified as an IA, the project maintains consistency with the following plans:

- Energy Functional Plan (DBEDT 1991)
- Agriculture Functional Plan (DBEDT 1991)

4.1.3 State Land Use Districts

The Hawai'i Land Use Law of Chapter 205, HRS, classifies all land in the state into four land use districts: Urban, Agricultural, Conservation, and Rural. The proposed project is located in the Agricultural District as defined under districting and classification of lands, Section 205-2 (d)(2), HRS.

Section 205-2 Districting and classification of lands:

(d) Agricultural districts shall include:

- 2) Farming activities or uses related to animal husbandry, and game and fish propagation;
- 6) Bona fide agricultural services and uses that support the agricultural activities of the fee or leasehold owner of the property.

4.2 MAUI COUNTY PLANNING DOCUMENTS

4.2.1 2030 General Plan, Countywide Policy Plan

The Maui County Plan, Chapter 2.80B of Maui County Code (MCC), adopted in 1990 and revised in 2010, establishes the overall theme, goals, objectives, and priority guidelines to guide the future long-range development of the county (Maui 2010).

The proposed project supports and is consistent with the following Maui County Plan objectives and policies:

Goal F. Strengthen the Local Economy

Objective 2: Diversify and expand sustainable forms of agriculture and aquaculture.

Policy e: Support ordinances, programs, and policies that keep agricultural land and water available and affordable to farmers.

Objective 4: Expand economic sectors that increase living-wage job choices and are compatible with community values.

Policy a: Renewable-energy industry

Goal I. Improve Physical Infrastructure

Objective 1: Improve water systems to assure access to sustainable, clean, reliable, and affordable sources of water.

Objective 3: Significantly increase the use of renewable and green technologies to promote energy efficiency and energy self-sufficiency.

Policy a: Promote the use of locally renewable energy sources, and reward energy efficiency.

Policy d: Encourage small-scale energy generation that utilizes wind, sun, water, biowaste, and other renewable sources of energy.

Policy e: Expand renewable-energy production.

Policy j: Encourage green footprint practices.

Policy k: Reduce Maui County's dependence on fossil fuels and energy imports.

Policy m: Promote and support environmentally friendly practices in all energy sectors.

4.2.2 Moloka'i Community Plan (2001)

The Moloka'i Community Plan, Chapter 2.80B of MCC, adopted in 1980 and updated in 1991, establishes the overall theme, goals, objectives, and priority guidelines to guide the future long-range development of the county (Maui 2012).

The proposed project supports and is consistent with the following Moloka'i Community Plan objectives and policies:

Economic Activity

Objective 3: Maintain agriculture as an important economic activity on the island.

Objective 12: Promote self-sufficiency by using local raw materials, food products and natural energy sources without negatively impacting the local resources' carrying capacity.

Energy and Public Utilities

Objective 1: Accelerate the development of alternative energy sources, such as solar and wind to help reduce the dependence on oil and fossil fuels.

Objective 2: Provide incentives to promote the use of alternative energy sources.

Water

Objective 3: Improve current water quality and distribution system and develop new water sources for the Moloka'i Community Plan area without taking water from Pelekunu and Wailau Valleys.

Objective 4: Develop improved transmission and/or storage systems to provide better fire protection.

Objective 5: Promote programs for water conservation as well as ground water and wellhead protection.

5.0 FINDINGS AND CONCLUSION

The accepting authority anticipates a FONSI. A final declaration will be made after the authority has considered all agency and public comments on the Draft EA.

In accordance with HAR §11-200-12 (DOH 1996b), the proposing agencies have considered every phase of the Proposed Action, the expected consequences, both primary (direct) and secondary (indirect), and the cumulative as well as the short-term and long-term effects of the action, in order to determine whether the Proposed Action may have a significant effect on the environment. In making this determination, the Proposed Action has been evaluated with respect to the significance criteria established in HAR §11-200-12.

- **Involves an irrevocable commitment to, loss or destruction of any natural or cultural resources.**

Only short-term construction related impacts are anticipated for ambient air quality, agricultural resources, soils, and biological resources. The Proposed Action would clear approximately 4,100 square ft of existing vegetation and surface soils. No special status species have been identified within the project area.

No surface historic properties were observed within the Project area. Consultation with the State Historic Preservation Division was initiated on 9 March 2012, and is currently under review with the consulting archaeologists at Maui Archaeology to determine the appropriate scope of work to complete the Project's historic preservation review process.

- **Curtails the range of beneficial uses of the environment.**

There would be no change to the current or potential land use within the project area because of the Proposed Action. Management and use of the land would remain consistent with a designation of agricultural use.

- **Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.**

The Proposed Action is consistent with the state environmental policies, goals, and guidelines established in Chapter 344, HRS. The DOA has integrated the review of environmental effects with existing planning processes, and has developed the design for avoiding, minimizing, and mitigating any adverse environmental effects. Other agencies

identified as having expertise or jurisdiction by law, were also consulted during the planning and permitting processes. In accordance with HRS §344-5, this EA is made available for public review and comment for a period of 30 days. All comments received during the public comment period will be responded to in the Final EA.

- **Substantially affects the economic welfare, social welfare, and cultural practices of the community or State.**

No socioeconomic impacts to the community are anticipated with implementation of the Proposed Action.

- **Substantially affects public health.**

The Proposed Action would not have long-term impacts on public safety and health.

- **Involves substantial secondary impacts, such as population changes or effects on public facilities.**

No adverse secondary impacts are anticipated with implementation of the Proposed Action.

- **Involves a substantial degradation of environmental quality.**

No long-term adverse impacts to any resource evaluated in this EA are anticipated with implementation of the Proposed Action.

- **Is individually limited, but cumulatively has considerable effect on the environment, or involves a commitment for larger actions.**

The Proposed Action does not involve a commitment for larger actions. Land use in the proposed project vicinity is designated as agricultural land. No other past, present, or planned actions associated with these land uses have been identified that would contribute to adverse cumulative impacts for any of the resources considered in this EA.

- **Substantially affects a rare, threatened, or endangered species or its habitat.**

No special status species have been identified within the project area. No adverse impacts to rare, threatened, or endangered species or its habitat are anticipated with implementation of the Proposed Action.

- **Detrimentially affects air or water quality or ambient noise levels.**

Short-term adverse construction impacts to air quality and ambient noise levels are possible during implementation of the Proposed Action. However, BMPs to be implemented during construction would reduce these impacts. The Proposed Action would have no long-term impacts on air quality noise, or surface water quality.

- **Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters.**

The project area is not located in a flood plain, tsunami zone, or coastal area. The Proposed Action will not likely suffer damage from any natural disasters.

- **Substantially affects scenic vistas and view planes identified in County or state plans or studies.**

The Proposed Action would have no long-term adverse impacts on the scenic quality of the roadway corridor.

- **Requires substantial energy consumption.**

Implementation of the Proposed Action would generate renewable energy and provide the assistance in achieving the State of Hawai'i's 2030 Clean Energy Initiative by reducing the need of conventional diesel electric power generation.

5.1 ANTICIPATED DETERMINATION

To determine whether the Proposed Action would have a significant impact on the human, natural, or historic environments, this EA has evaluated the direct and indirect effects and short-term, long-term, and cumulative impacts. The Proposed Action has been evaluated with respect to the significance criteria, as discussed in Section 5.0. Based on this evaluation, it is anticipated that the Proposed Action would not have a significant adverse impact on the environment. Therefore, a FONSI is anticipated.

6.0 DISTRIBUTION LIST

Copies of the Draft EA are provided to the recipients listed below and are also available upon request.

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1151 Punchbowl Street, Room 325
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7.0 LIST OF CONTRIBUTORS

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Years of Experience: 4

Ms. Yue Qiu, Staff Environmental Scientist
Years of Experience: 1

Ms. Julia Staley, Environmental Planner
Years of Experience: 6

8.0 REFERENCES

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PHOTOS



Photo 1: Existing MIS Pipe at the Proposed Project Location



Photo 2: : Existing MIS Pipe at the Proposed Project Location with Representative Vegetation Shown

Appendix A
Agency Correspondence

March 6, 2012

Mr. Ross Stephenson
Historian
Department of Land and Natural Resources
Hawai'i State Historic Preservation Division
Kakuhihewa Building
601 Kamokila Blvd, Suite 555
Kapolei, Hawai'i, 96707

**Subject: Chapter 6E-8 Historic Preservation Review for the Moloka'i Irrigation System –
Hydropower Project, Moloka'i, Hawai'i, (TMK) 2-53-003:015**

Mr. Stephenson,

The State of Hawai'i Department of Agriculture, Agricultural Resource Management Division is proposing a hydropower installation project be undertaken along the existing Moloka'i Irrigation System pipe approximately 2 miles northeast of the community of Kaunakakai, Moloka'i (Figure 1-1: Site Location Map).

Project Description

The Proposed Action is a minor modification to the Moloka'i Irrigation System (MIS), whereby energy used for pumping water in the Waikolu Valley would be partially recovered by a turbine-generator installed alongside the existing pipeline, Tax Map Key (TMK) 2-53-003:015.

Additionally, the Proposed Action also provides for the installation of 7 additional Maui Electric Company (MECO) poles in order to extend the overhead pole line to the nearest existing MECO pole, located approximately 1,300 feet northeast of the proposed hydropower installation site and back along the existing access road and easement. The length of power line extension from the hydroturbine facility to the electrical point of connection is approximately 2,500 feet and would require approximately 13 additional MECO poles (based on 200 foot spans). (Figure 1-2: Proposed Action & Alternative Map). Alternative 1 provides the extension of a new overhead pole line back to the West Portal near Moloka'i Tunnel and would connect after the existing MECO primary meter. The length of this power line extension from the hydroturbine facility to the electrical point of connection is approximately 4,300 feet and would require approximately 22 additional MECO poles.

The Proposed Action and Alternative 1 were determined based on several factors, including public safety, construction cost, and sound engineering principles.

The State of Hawai'i Land Use Commission and the Moloka'i Community Plan designate the proposed project area as Agriculture Land Use - *This use indicates areas for agricultural activity which would be in keeping with the economic base of the County and the requirements and procedures of Chapter 205 HRS, as amended.*



The Agricultural Land Use Map has designated this agricultural land as grazing land. No Conservation Districts and no Agricultural Lands of Importance exist in close proximity to the project area. The proposed project area is located on Moloka'i Ranch with entry and exit to the site crossing over lands owned by the Department of Hawaiian Homelands. A small herd of cattle are present and have the ability to roam and graze throughout this secured portion of Moloka'i Ranch where entrance must be accessed with permission through a series of locked gates.

Project Construction Activities

Proposed construction activities for the Proposed Action and Alternative 1 would include the following activities:

- Installation of appropriate erosion control measures
- Grubbing and grading of land to prepare for pouring of concrete slab
- Construction of concrete slab
- Installation of above ground pipe, turbine and all appurtenances
- Installation of power unit and enclosure
- Installation of above ground power line for connection to existing MECO power line
- Reprogram the existing Supervisory Control and Acquisition (SCADA) system at the DOA Moloka'i office to accept signal from proposed turbine
- Possible installation of wireless radio antenna or telephone cables on power line pole

As part of the preparation of an environmental assessment for this project, we would like to seek your views and comments about this project and its surrounding area. We are particularly interested in any information regarding the presence of historic sites, cultural traditions and activities, legends or practices associated with this area. Any information you are willing to share about this area of Moloka'i would be greatly appreciated.

Attached for your use are the following:

1. Figure 1-1: Site Location Map
2. Figure 1-2: Proposed Action & Alternative Map

Thank you for your assistance, and should you have any questions please contact Katie Langford of AECOM, at (808) 356-5310 or Katie.Langford@aecom.com.


Katie Langford
AECOM

cc: Mr. Glenn Okamoto, Department of Agriculture
Mr. Martin Nakasone, AECOM
Ms. Jennifer Scheffel, AECOM

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NOTES

1. Map projection: Hawaii State Plane Zone 3, NAD83.
2. Aerial photo source: USGS 2006.

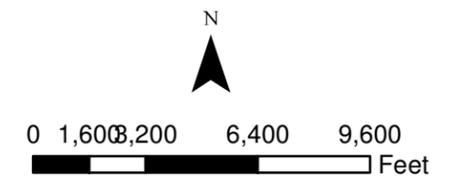
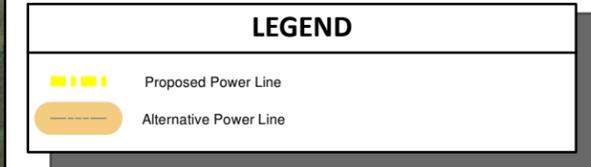
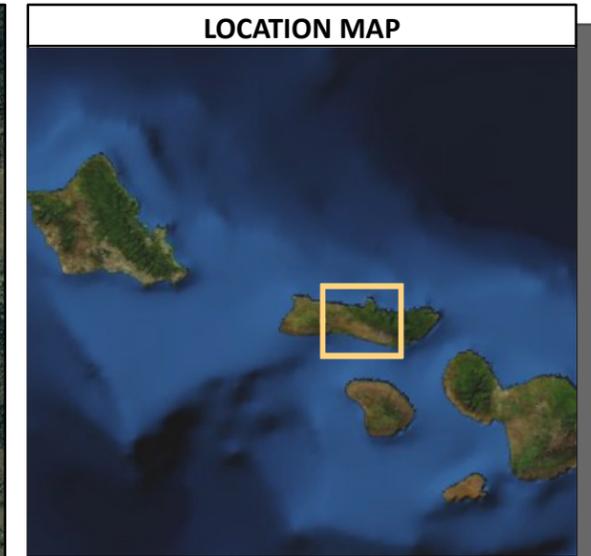
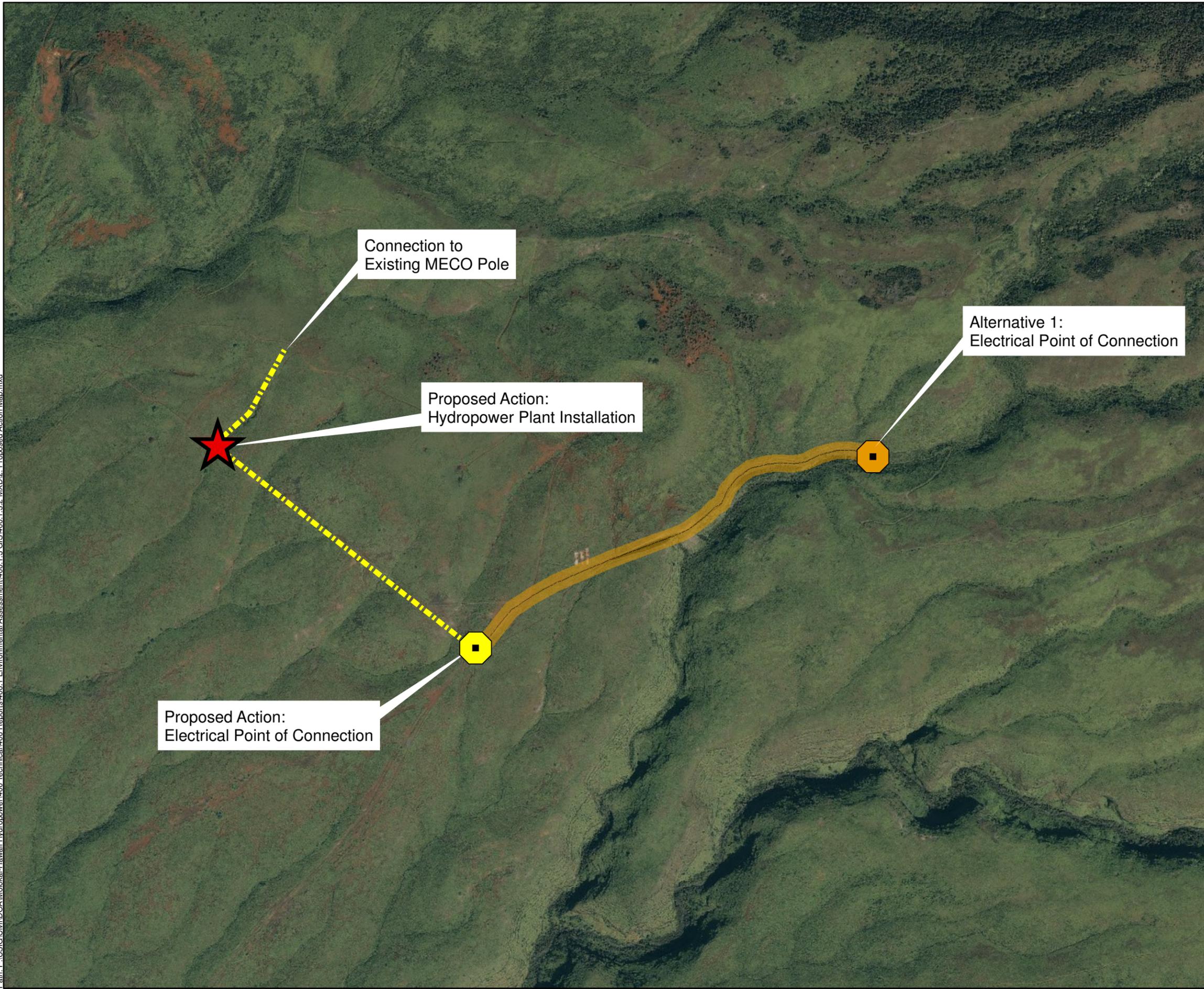


Figure 1-1
 Site Location Map
 Molokai Irrigation System -
 Hydropower Plant
 Molokai, Hawaii

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NOTES

1. Map projection: Hawaii State Plane Zone 3, NAD83.
2. Aerial photo source: USGS 2006.

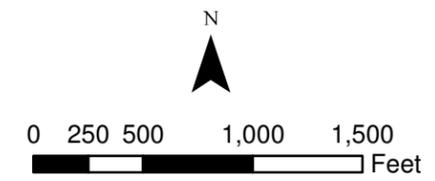


Figure 1-2
Proposed Action & Alternative Map
Moloka'i Irrigation System -
Hydropower Plant
Moloka'i, Hawai'i

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