Final Environmental Assessment

For Kōlea Reservoir (HI00097) Removal

Hāna, Maui, Hawai ʻi

Department of Accounting & General Services
State of Hawai ʻi
DAGS Job No. 15-23-7409

Prepared by:
oceanit

Oceanit Center
828 Fort Street Mall, Suite 600
Honolulu, HI 96813

March 2011

Table of Contents

List of Figures

List of Tables

Appendices

Page Intentionally left Blank

General Information Summary

Applicant/Proposing Agency:	State of Hawai'i Department of Accounting and General Services Kalanimoku Building 1151 Punchbowl Street Honolulu, HI 96813
Owner:	State of Hawai'i Department of Land and Natural Resources Kalanimoku Building 1151 Punchbowl St. Honolulu, HI 96813
Consultant/Preparer:	Oceanit Suite 600 828 Fort Street Mall Honolulu, HI 96813
Approving Agency:	State of Hawai'i Department of Land and Natural Resources Kalanimoku Building 1151 Punchbowl Street Honolulu, HI 96813
Project Description:	The Kōlea Reservoir (HI00097) in the Hāna District is no longer needed for storage of stream water for agricultural irrigation and will be removed and restored to a natural stream in the area of the existing reservoir. During construction the stream water will be diverted around the construction site alongside the existing spillway. The reservoir will be graded to form a15-foot wide channel with 2:1 slope sides then grassed using either seeded sprayed mulch or reinforced grass mats to stabilize the soil. Grassing will also be planted in the area upstream of the constructed channel for erosion control. In addition, check dams will be installed within the realigned stream and after the rip-rap apron to filter out sediment before discharging downstream of the existing reservoir. When the grass is established, the bypass line will be removed and redirected to the new stream bed channel. There is a significant elevation change from the channel upstream to downstream, similar to the existing spillway. Therefore, a grouted riprap apron will be constructed to direct the flow to the stream below.
Anticipated Determination:	Finding of No Significant Impact (FONSI)
Agencies Consulted:	US Army Corps of Engineers State Department of Land and Natural Resources, Office of Conservation and Coastal Lands State Department of Health, Clean Water Branch

	State Coastal Zone Management State Historic Preservation Office Office of Hawai'ian Affairs US Fish & Wildlife National Oceanit and Atmospheric Administration County of Maui, Planning Department County of Maui, Public Works
Tax Map Key:	(2) 1-1-001:050
State Land Use:	Conservation
County General Plan:	Conservation
County Zoning:	Conservation

1 Introduction

This environmental assessment (EA) is being prepared by the Department of Land and Natural Resources (DLNR), State of Hawai`i. In accordance with Chapter 343, Hawai'i Revised Statues and the Department of Health's Administrative Rules (HAR) Chapters 11-54 and 11-55, this EA provides a written evaluation of technical, environmental, social and economic aspects of the proposed Kōlea Reservoir Removal project.

The DLNR will be removing Kōlea Reservoir because it is no longer needed for irrigation. The reservoir is located on the windward side of the island of Maui in the Hāna District (see Figure 1-1). The reservoir was constructed in 1901 and has six features: 1) spillway; 2) reservoir; 3) catwalk; 4) a dam embankment; 5) reservoir outlet; and 6) reservoir. There is also a diversion structure downstream of the dam (Center Ditch) which is operated by East Maui Irrigation Company (EMI) and will remain as part of the irrigation system and is not part of this project. The project is also not related to the on-going implementation of Interim Instream Flow Standards (IIFS) in East Maui. Both Kōlea Reservoir and Center Ditch were included by EMI in the Commission of Water Resource Management (CWRM) Water Use Registration database in 1989. As previously mentioned, the Center Ditch is not a part of this project and we are obtaining the necessary CWRM permits to remove Kōlea Reservoir.

The reservoir will be removed by breaching the dam to form a 15-foot wide earth channel with 2:1 sloping sides. On the downstream side of the reservoir, a grouted riprap apron will be constructed to allow the stream water to flow into Kōlea Stream in the vicinity where the existing spillway currently flows into the stream.

Photos showing the existing reservoir are shown in Figures 1-2 through 1-5. The tax map key number for this project is (2) 1-1-001:050. The State is the owner of this parcel.

Special environmental studies conducted for this EA include: 1) Archaeological Reconnaissance Survey; 2) Cultural Impact Assessment; 3) Architectural Inventory Survey; and 4) Biological Surveys (Botanical, Aquatic, and Terrestrial Vertebrates). A summary of these studies have been provided in this EA and a copy of the detailed reports are included in the Appendices.

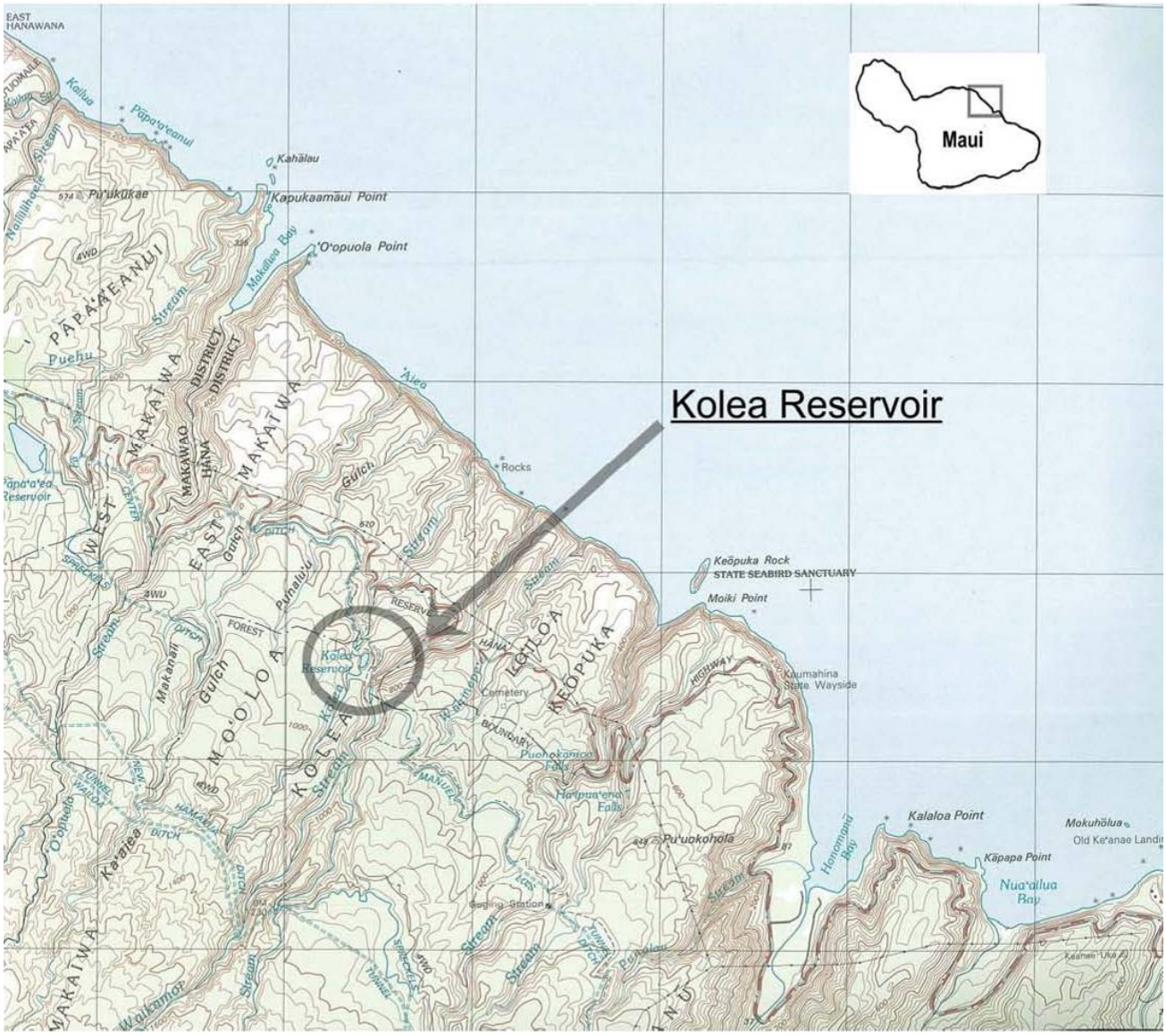


Figure 1-1. Location of Kōlea Reservoir

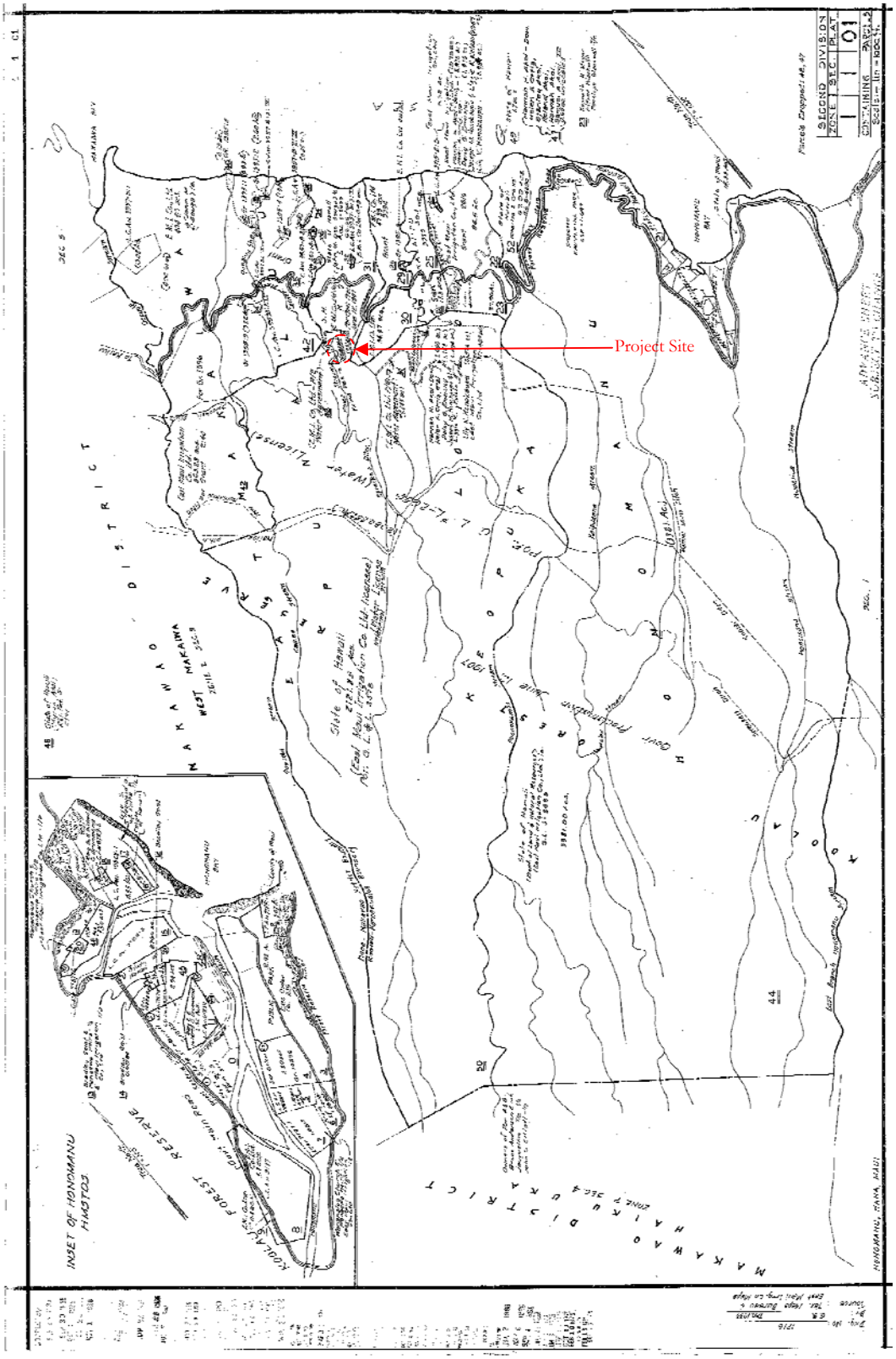


Figure 1-2. Tax Map Key of Project Site

Figure 1-3. View of the Existing Reservoir and Catwalk

Figure 1-4. View of Inflow from Existing Stream

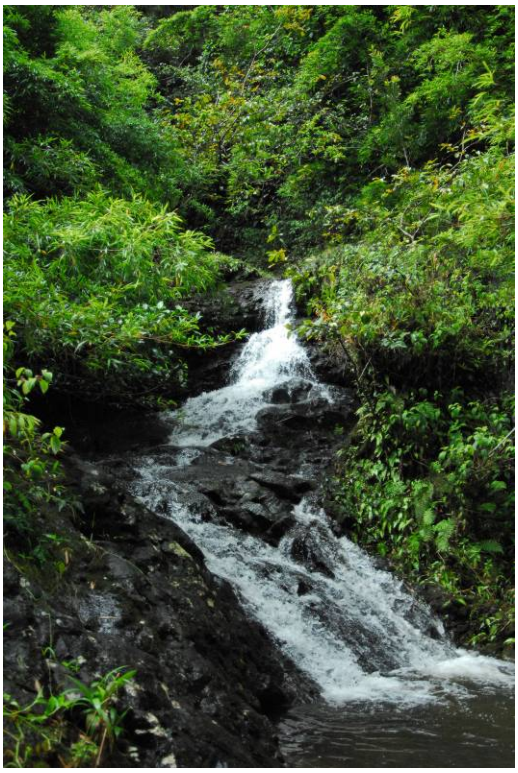


Figure 1-5. View of the Spillway Flowing Down to the Stream

Figure 1-6. View of Secondary Control Wheel
(The primary control wheel is located on the catwalk)

Page Intentionally left Blank

2 Project Description

2.1 Location of Project and Description

Kōlea Reservoir (HI00097) is located on the island of Maui on the windward side of the island in the Hāna District. The reservoir is approximately one mile inland from the coastline. The land is owned by the State of Hawai'i and the tax map key (TMK) number is (2) 1-1-001:050. The water surface area of the reservoir is approximately two acres in size. There are two streams named "Kōlea" in the immediate vicinity. The proposed project details the Kōlea Stream that flows into the Kōlea Reservoir. The Kōlea tributary to Punalau Stream is not a part of this project.

The reservoir has been used in the past to divert agricultural irrigation water to the East Maui Irrigation ditch system. Water from this reservoir is no longer needed for irrigation, so the reservoir will be removed to allow Kōlea Stream to flow downstream without any obstructions. The dam that holds the water in the reservoir will be breached. A 15-foot wide channel with 2:1 side slopes will be constructed. The channel will be grassed using seeded spray mulch or reinforced grass mats.

During construction a bypass line will be used to divert stream flow to the downstream side of the reservoir. When the grass has established itself in the new stream channel the bypass line will be removed and water will be redirected.

2.2 Existing Land Use Classifications

The project is located within the conservation area of Maui County, in the Hāna District. The State Land Use designation is "C" (Conservation) and classified under the Conservation District Subzone "Resource," as shown in Figures 2-1, and 2-2. Maui County Community Plan and Hāna Community Plan also designate the project area in the conservation district.

The project site is within the Conservation District as shown in Figure 2-1. Therefore a Conservation District Use Permit (CDUP) will be required. The project is also within the Coastal Zone Management (CZM) area and a CZM certification will be required prior to construction. The project is not within the Special Management Area of the County of Maui.

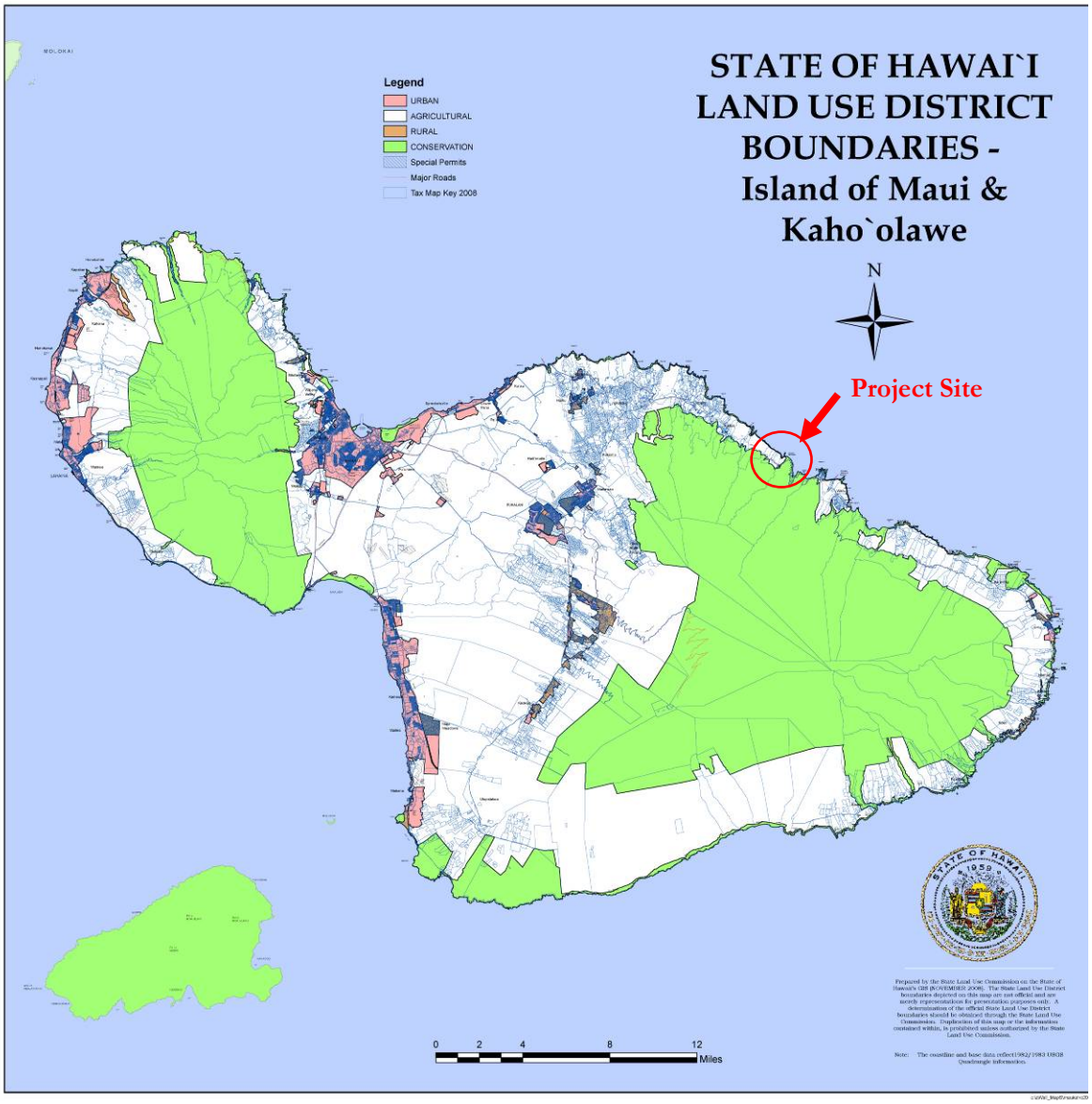


Figure 2-1. State Land Use Map

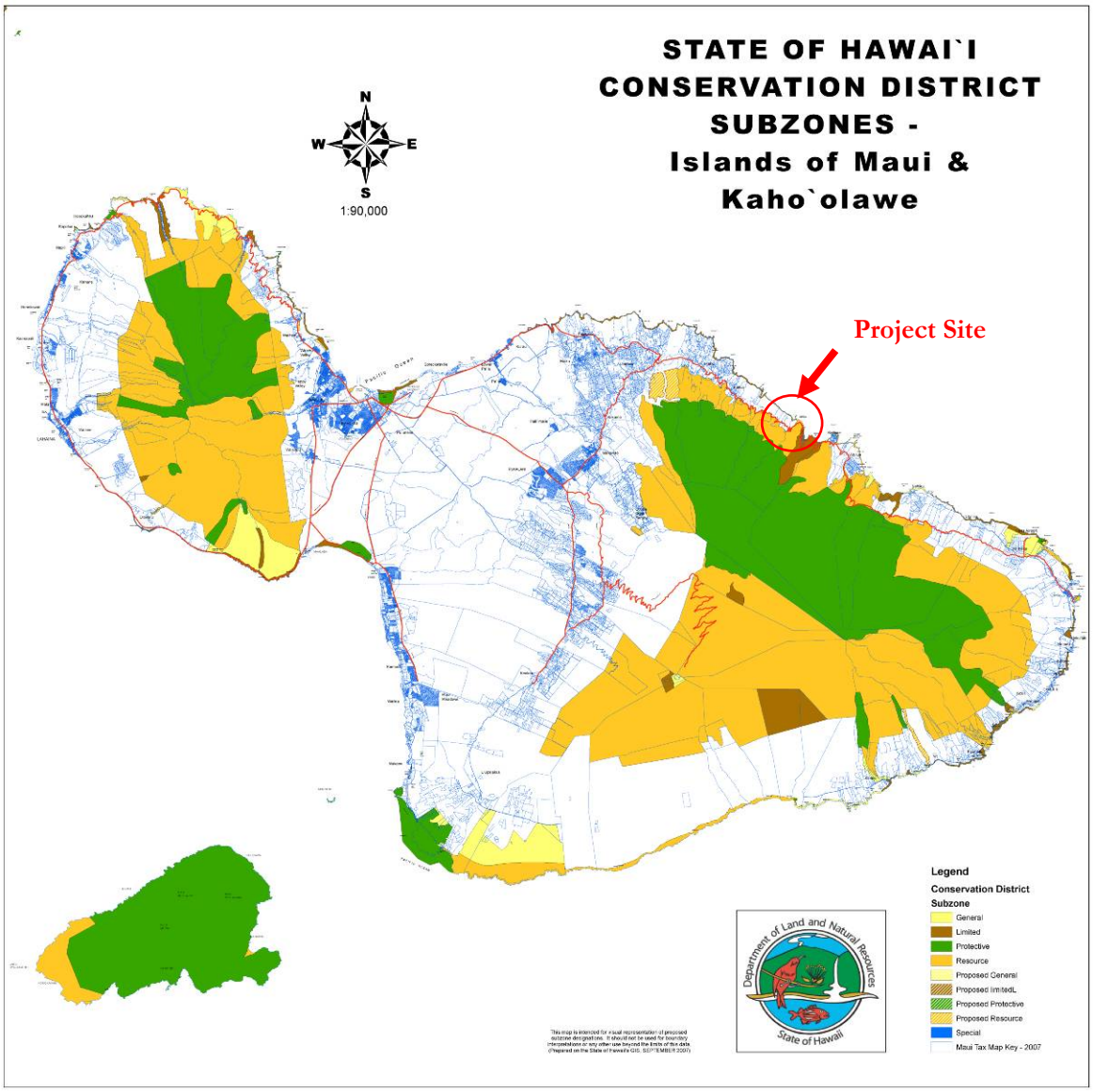


Figure 2-2. State Conservation District Subzones

Page Intentionally left Blank

3 Alternatives Considered

3.1 No Action Alternative

The no action alternative would mean that the reservoir will remain intact until nature or human neglect alters its current state. Proper maintenance and inspections would be required continually to maintain the safety of the reservoir site, and the surrounding area.

3.2 Dam Repair Alternative

The alternative to repair the dam was considered but was abandoned as the repair would cost more than the proposed project alternative of dam removal. The dam currently does not have any known structural defects. Despite this, extensive rehabilitation work would be necessary to bring the dam in compliance with State Dam Safety Standards. Ideally, the purpose of the project is to remove a potentially hazardous dam. The Phase I Visual Dam Inspection Report by GEI Consultants concluded that Kōlea Reservoir is in "conditionally fair" condition. To rehabilitate this structure and have it to be a viable component of East Maui Irrigation Company's water system is extremely cost prohibitive. GEI Consultants made the following recommendations for maintaining the dam and assessing the dam's condition. Additional construction work would be required to implement the recommendations of these studies.

Priority 1 Recommendations:
1. Implement a vegetation control plan coordinated with inspections
2. Conduct a survey of the entire embankment and spillway
3. Remove slumped soil and investigate condition of buried pipe
4. Investigate condition of the outlet pipe, and make necessary repairs.
5. Implement a plan and schedule for monitoring seepage flows.

Priority 2 Recommendations:
1. Confirm the upstream watershed drainage
2. Conduct a Phase II Hydrology and Hydraulics Study
3. Perform a Phase II Stability analysis.
4. Update the Emergency Action Plan
5. Repair or replace the staff gage

3.3 Proposed Project Alternative

The proposed project alternative entails breaching the dam and restoring the stream to a more natural condition. During construction a pipe alongside the existing spillway will be used to divert flows away from the construction site. Additional bypass lines will also be directed to the two existing outlets on the north. The reservoir will be re-graded to form a 15-foot wide channel with 2:1 sloping sides. The channel and side slopes will be grassed using seeded mulch spray or reinforced grass mats. On the downstream side of the channel a riprap apron will be constructed to allow the water to flow into the stream below. Check dams will be installed within the channel every 50 feet up to the location where the stream enters the existing reservoir. These check dams and grassing will reduce the amount of sediment traveling downstream. They are not intended to be permanent, as overtime, they will be dismantled by flood flows in the stream. Once the permanent erosion control grassing is established, the temporary bypass lines will be removed and/or cut and plugged to allow

the stream water to flow into the new channel. Figure 3.1, Erosion control Plan outlines this idea. Water from the completed project will enter the existing stream at the same location of the existing spillway via a riprap as shown on Figure 3.2, Grading Plan. The dam was constructed in 1901 in the path of the existing stream. The re-graded area of the reservoir is the general location of the original stream bed.

Sequence of Construction:

- Lower water level in reservoir
- Install temporary erosion control items
- Install temporary storm water bypass berm, siphon and drain lines
- Construct dam breach and embankment fill
- Install grouted riprap to dam breach channel as required
- Install permanent erosion control items
- Remove temporary storm water bypass items
- Remove temporary erosion control items

3.3.1 Best Management Practices (BMP) Plan

The proposed BMP plan for the reservoir removal is an overview of erosion control items and water quality monitoring for the duration of construction. The site-specific BMP's are usually provided by the contractor 30 days prior to construction as they are responsible for their construction means and methods. Deconstructing the dam will take several steps to insure safety, environmental care, and any obstructions in the natural flow of the stream.

The water quality of the stream above and below the project site will be monitored for two weeks prior to the start of construction. Once a water quality baseline is established, temporary erosion control items such as sandbags, and silt fencing will be set in place. Before the reservoir can be drained, a temporary storm water bypass, siphon, and drain lines must be in place. The dam will then be breached to form a 15-foot wide channel with 2:1 sloping sides and the existing reservoir will be filled with the excavated material. The channel and side slopes will be grassed using seeded mulch spray or reinforced grass mats.

A grouted riprap apron will be installed along the downstream side of the breached channel using the rocks that were removed from the reservoir breach. Check dams will be installed within the channel every 50 feet up to the location where the stream enters the existing reservoir. These check dams and grassing will reduce the amount of sediment traveling downstream. Once the permanent erosion control grassing is established, the temporary bypass lines will be removed and/or cut and plugged to allow the stream water to flow into the new channel. Water from the completed project will enter the existing stream at the same location of the existing spillway via a riprap apron. The dam was constructed in the path of the existing stream and the re-graded area of the reservoir is the general location of the original stream bed. Water quality monitoring will continue throughout the

construction and for one week after the project's completion. Since the stream will be returned to its natural condition, no future maintenance or repair will be necessary.

Work duration is approximately six to seven months including mobilization and construction.

Page Intentionally Left Blank

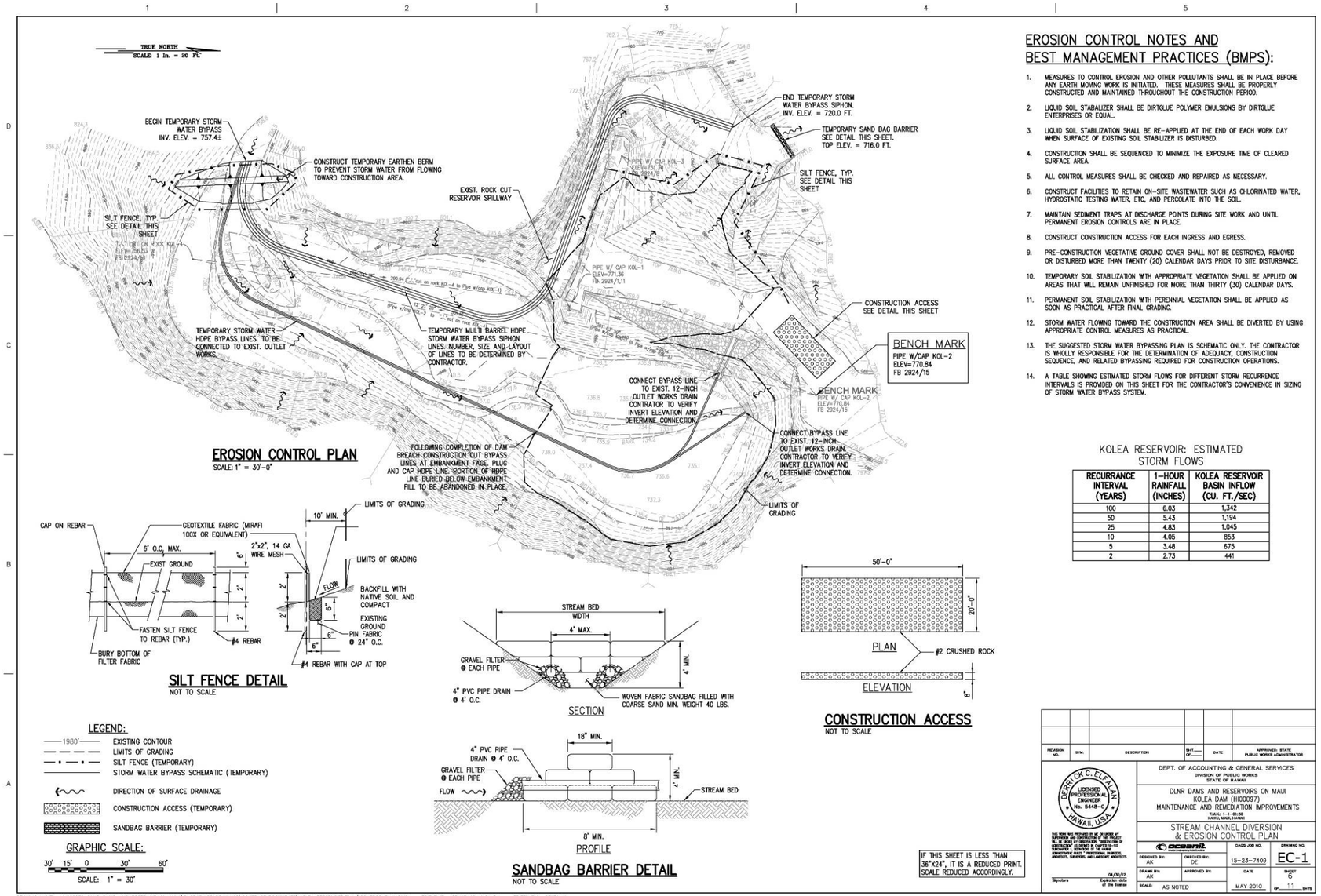


Figure 3-1. Proposed Project Alternative: Removal of Dam – Erosion Control Plan

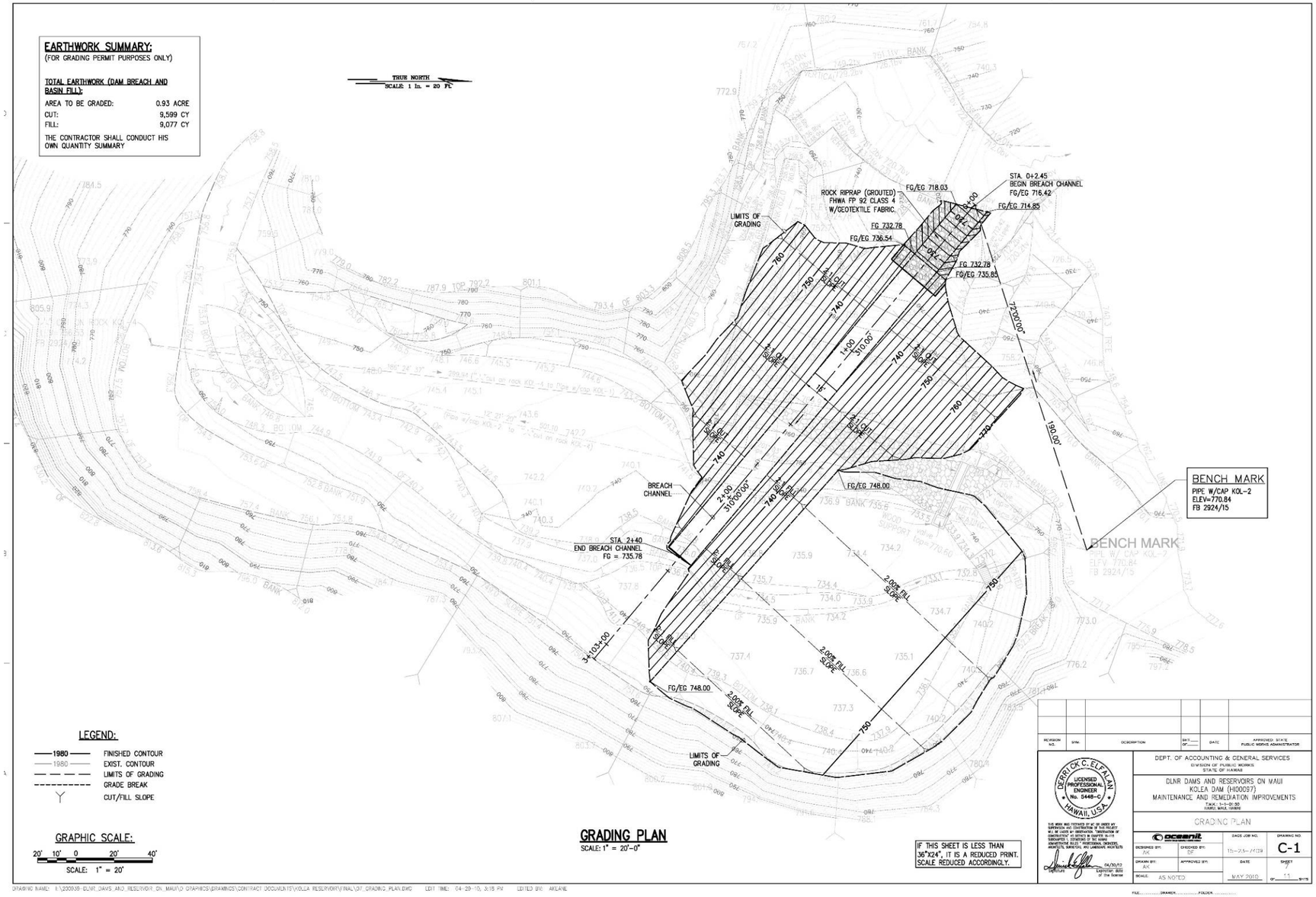


Figure 3-2. Proposed Project Alternative: Removal of Dam – Grading Plan

4 Physical, Biological and Cultural Environment

4.1 Climate, Topography, and Soils

As the second largest island in the State of Hawai'i, Maui is approximately 727.2 square miles and is made up of two volcanoes, the west Maui volcano, and Haleakalā volcano. The West Maui Volcano, also known to the Hawaiians as Mauna Kahalawai, forms a shield volcano at 5,788 feet. On the East side of Maui, Haleakalā rises to more than 10,000 feet above sea level. Between the volcanic masses lies a valley that has been formed by sandy erosional deposits. Although the western volcano has been eroded considerably and is cut by peaks and drainages, the eastern sides of both volcanoes are carved into deeply incised valleys and steep ravines that run down slope to the rocky shoreline.

Maui, like the other Hawaiian Islands, has a mild semi-tropical climate that varies across the terrain. Average temperatures range from 83 degrees Fahrenheit in the warmer months and 67 degrees Fahrenheit in the cooler months. In the project area, average rainfall is between 120 inches and 160 inches. Average rainfall varies across the county at 81 inches in Hāna, 26 inches in Moloka'i, and 30 inches in West Maui. The northeast trade winds blow approximately 80 percent of the time, but are interrupted by Kona storms from the southeast during the winter months.

The island of Maui is made up of 10 soil associations. Soil associations in the vicinity of the project are made up of volcanic ash and moist environments to form Andisol and Entisol soil types. Rough Mountainous Terrain (rRT) and basalt boulders are the main type of soil found in the project area.

4.1.1 Impacts

Removing the dam will not have an impact on climate. However, the topography will be modified to allow for a more naturally flowing stream. The soil will be graded with existing onsite material; therefore, the soil will not be changed.

4.1.2 Mitigation

The Kōlea Reservoir remediation project is not expected to adversely affect the climate, topography, or soils. Therefore, no mitigation measures are proposed.

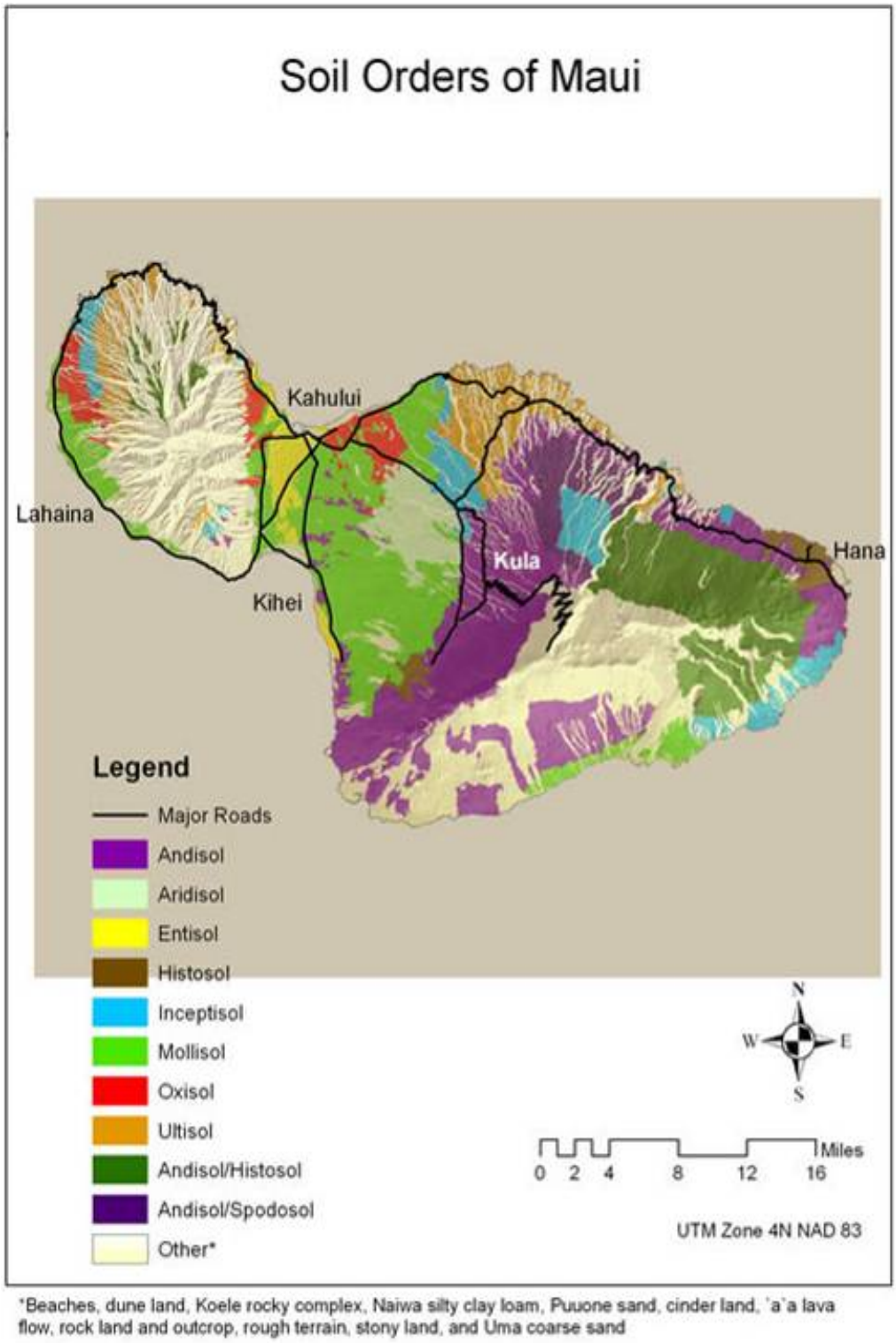


Figure 4-1. Soil Orders of Maui Map

4.2 Natural Hazards

Natural hazards consist mainly of hurricanes, tropical or severe storms, flooding, landslides, high wind, fire, earthquakes and volcanic activity. Haleakalā Mountain is considered a dormant volcano, therefore hazards from volcanic activity is not expected. Maui is also within earthquake zone 2B, on a scale of 0 to 4 with 4 having a 10 percent chance of severe shaking in a 50-year interval and 0 having no chance of severe shaking. At Kōlea Reservoir other hazards such as vegetation may obstruct the stream flow.

A geophysical survey was conducted at the project site by Global Geophysics on April 27, 2010 to evaluate the subsurface geologic conditions. Two locations were evaluated and the following information was found: the depth to bedrock varies from 5 ft to 34 ft; and the velocity of the bedrock at the soil/bedrock interface is 7,650 ft/s.

The existing reservoir dam has a low dam safety classification. The removal of the reservoir and breach of the dam has been designed for 100-year storm event.

4.2.1 Impacts

Natural hazards of this area cannot be controlled but rather remediated after the events occur. Risks of property and human life are low since the project area is in a remote location; however, the reservoir is located 0.25 miles inland from Hāna Highway, a road traveled by tourists regularly. The stream travels under the highway bridge and floods, and landslides are always a concern.

4.2.2 Mitigation

Permanent erosion control that will be installed will minimize the adverse effects from storms in the area. In addition, the project has been design to pass a 100-year storm event.

4.3 Ocean and Coastal Environment

Oceanit conducted a stream assessment survey at the stream mouth at its ocean outfall on December 30, 2010. The site assessment was taken from below Hāna Highway to the mouth of Kōlea Stream.

The stream bed is in a very deep (20-30ft.) gulch with almost vertical sides up to a grassy pasture. The shoreline is an almost vertical cliff estimated to be 300 feet high to the point where the stream falls over the cliff face. The vertical cliff face is lined with Hala trees making it difficult to access the stream mouth from the land side.

The beach itself appears to consist of cliff face boulder rubble. The boulder rubble at the base of the cliff appears to be completely awash at high tide, but rapidly slopes to deep water. There is no offshore reef at this location with North Pacific swells impacting directly against the shoreline. The combination of wind and waves on the shoreline creates a highly energy charged environment. The height of the vegetation belt up on the cliff face suggests that during normal tradewind weather the wave and splash zone is tens of feet above sea level. It does not appear reasonable to conduct a marine benthic survey or to install sedimentation meters at this outfall because the high shoreline energy and deep water immediately adjacent to shore would appear to preclude the possibility of any significant sedimentation accumulating on the benthic substrate to the extent that it could compromise the growth of corals or adversely impact other marine species.

4.3.1 Impacts

The mouth of Kōlea Stream is a waterfall onto a boulder beach into deep ocean water. The project area is inland from the ocean; however the extremely narrow cobble and rock stream bed with steep walls does not appear susceptible to the settlement of fine sediments. Due to the high shoreline energy and deep water immediately adjacent to shore the possibility of any significant sedimentation accumulating on the benthic substrate to the extent that it could compromise the growth of corals or adversely impact other marine species is most likely impossible or very rare.

4.3.2 Mitigation

To reduce sediment from entering coastal waters, the entire site will be grassed from the entrance to the existing reservoir to the new riprap structure to prevent soil erosion. The side slopes of the 15-foot wide channel will have reinforced grass mats to stabilize the side slopes. A series of check dams have also been installed from the channel entrance upstream to where the stream water enters the existing reservoir to facilitate sediment dropping out of stream water. Downstream of the riprap apron, a final check dam will be installed prior to flowing downstream and into the ocean.

Figure 4-2. Photo of Stream Mouth

4.4 Aquatic Resources

A survey done on April 14, 2010 investigated the aquatic environment to determine whether or not there were any aquatic resources in Kōlea Reservoir or surrounding areas. AECOS, Inc. surveyed aquatic biota at several locations in Kōlea Stream, Kōlea Reservoir, and Center Ditch. The survey investigated six locations specifically in the following areas: below the pier extending out from the dam, near the spillway, near the center of the eastern shoreline, two locations along the southern shoreline, and close to where Kōlea enters the reservoir.

Only a few species of aquatic invertebrate and insect were observed at these six survey locations. No aquatic fishes were observed within the surveyed area, which included the stream, reservoir, and

ditch. However, there was an abundance of the day mosquitoes (*Aedes albopictus*). There was also the presence of the rare scarlet skimmer (*Crocothemis servilia*) observed along the vegetation, and the American crayfish (*Procambarus clarkii*) observed in the south shore waters. A single damselfly was briefly seen, but was not species identified.

A steep drop into the ocean at the shore, and a low head dam on the stream at the point where the Center Ditch crosses poses impediments to upstream migration of non-native fishes. These impediments would not pose as a barrier to all native species, several of which are capable of scaling waterfalls. The American crawfish is capable of overland migration and is considered non-native. The Kōlea Stream system does connect to other streams in the east section of Maui. Lateral connections between these streams likely serve as routes for native and non-native aquatic resources.

4.4.1 Impacts

None of the aquatic resources found during the survey are considered threatened or endangered according to the U.S. Fish and Wildlife Service or by the State of Hawai'i. Thus, no impacts on aquatic resources are expected. Assessment of Kōlea reservoir and stream indicated that the removal of the earthen embankment dam may return this segment of Kōlea stream to a more natural state that will favor recruitment of native species, causing a positive impact on the environment. Currently the reservoir my not support non-native species as they have not been introduced or downstream access may be difficult. When the reservoir is at above average flow, the stream reaches the Center Ditch through a pipe. The spillway overflow may not be a barrier to native anadromous species but could act as a barrier for upstream migration of non-native species. The damselfly breeding is somewhat unknown, however adult damselflies appear to not associate with streams, so removal of the dam is unlikely to affect this species. No known damselfly habitat was identified at the project site. Longer term positive impacts are anticipated because this section of the stream will be restored to a naturally flowing stream.

4.4.2 Mitigation

Since there were no endangered aquatic fishes or invertebrates in the project area, to adverse impact is expected.

4.5 Botanical Resources

A botanical survey of the site was conducted in April 2010 by AECOS, Inc. During the survey, 80 species of fern, conifers, and flowering plants we recorded. There were 66 flowering plants and ferns found at the project area. Of the 66, there were two endemic species, eight indigenous species and two Polynesian introduced species. The two endemic species were the *uluhe* fern (*Dicranopteris linearis*) and *hapu'u* (*Cibotium chamissoi Kaulf*).

The vegetation was dominated by invasive subspecies of Black bamboo known as Henon bamboo (*Phyllostachys nigra henionia*). The bamboo covers the north, east, and south sides in the immediate area of the reservoir. Shoe-button ardisia (*Ardisia elliptica*) appears abundant in areas not invaded by the invasive bamboo particularly along the unimproved road, away from the project site. None of the plant species found at the project site were classified on any state or federal endangered species list.

4.5.1 Impacts

The survey did not find any federally designated "critical habitats" for any plants currently protected under the Endangered Species Act of 1973. Given that there are no state or federal listed threatened or endangered plant species in the vicinity of the project, no adverse impacts are expected.

4.5.2 Mitigation

There will be no impact on threatened or endangered plant species, so no mitigation is required. The removal of Kōlea Reservoir will not have a negative impact on any plant species that is endangered or threatened as determined by federal and state regulations.

4.6 Avifaunal and Feral Mammals

A survey of the avian and terrestrial mammalian species was conducted on April 14, 2010 by AECOS, Inc. Two avian count stations were established at each end of the dam and monitored for one 8-minute point count each. Below the dam, two 30-minute counts were conducted to monitor any water bird activity. Lastly, visual inspections were completed of the dam and the surrounding areas. All sightings were recorded and counted with the aid of binoculars and by listening for avian vocalizations.

During the station counts, 26 individual birds of nine different species were observed and recorded. Of the nine species recorded, the endemic Hawai'i Amakihi (*Hemignathus virens wilsoni*) was observed while transferring between count stations at locations distant from the dam, and close to Hāna Highway. The other eight species observed were noted as alien species to the Hawaiian Islands. According to AECOS, all species observed are not listed on the federal or State of Hawai'i endangered species lists. Additionally, no water birds were detected or seen in the project area.

During the visual inspection avian diversity and densities appeared extremely low. Of the 26 birds observed, more than 46% were identified as the Northern Cardinal (*Cardinalis cardinalis*) and Japanese White-eye (*Zosterops japonicus*).

The survey of mammals was conducted by visual and auditory detection along with any evidence of scat, tracks or other animal signs. All mammalian species observed were recorded incidental in nature and was limited to one large unidentified rat (*Rattus sp.*) species spotted northwest of the spillway below the dam. AECOS noted that all terrestrial mammals that inhabit the island of Maui are alien species except for the endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) which was not observed in the survey.

4.6.1 Impacts

No avian or mammalian species currently listed or proposed for listing under the federal or State of Hawai'i endangered species statutes were observed or detected during the course of this survey. Thus no impacts are expected.

4.6.2 Mitigation

No mitigation is planned because there is no identified habitat for the endangered avian and mammalian species observed in the project area. However, if night-time construction activity or

equipment maintenance is proposed during the construction phases of the project, it is recommended that the lights be shielded to reduce the potential for interactions of nocturnal species not accounted for in AECOS' daytime survey.

4.7 Archaeological Resources

An archaeological inventory survey was conducted for the removal of Kōlea Reservoir on the Island of Maui. The survey is documented in a report dated July 2010 by Cultural Surveys Hawai'i. The inventory survey covered the area of potential effect (APE), which is approximately 4 acres.

During the inventory survey, six features were observed. One feature, the water diversion structure, is outside and located north of the project site and the other five features, the spillway, reservoir, a catwalk, the dam, and the reservoir outlet, are within the project area. The diversion structure is owned by EMI and will remain as part of the irrigation system according to The State Water Commission's decision released on May 28, 2010. This EMI diversion structure is not part of the Kōlea Reservoir Removal Project.

Located upstream of the Kōlea Dam and west of the reservoir is the spillway which was designed to allow excess storm water runoff to flow through the spillway when the water elevation reaches the 760.5 feet. The entire floor of the spillway is exposed bedrock and water diverted by this spillway is returned to the natural streambed via the plunge pools. During construction, no work will be done on the spillway.

Constructed in 1901 for irrigation purposes, Kōlea Stream Reservoir holds stream water and is composed of earthen material on all sides. The reservoir will be modified by filling in portions of the reservoir to restore Kōlea Stream to a more naturally flowing stream.

A wooden frame catwalk is located at the crest of Kōlea Dam which is built out into the reservoir on a pair of wood poles over 15 meters tall. The reservoir catwalk is an improvement constructed around 1970. Kōlea Dam was constructed to store water from Kōlea Stream for agricultural irrigation purposes. Removal of the dam and catwalk is necessary to restore stream flow.

The reservoir has a controlled gate outlet built into the reservoir that allows the water to exit and travel to a downstream location from the spillway.

Outside the project area is the concrete stream diversion controls located approximately 200 feet downstream from the spillway. This diversion is part of the EMI irrigation system and will remain untouched.

As a part of the cultural survey, Cultural Surveys Hawai'i sent letters, and interviewed family members, and significant people of the surrounding area. Those that provided information reaffirmed the history of the area and use of the stream for agricultural purposes. One of the families contacted for the survey was the Tateyama family with direct ties to Kōlea and the Waikamoi stream valley. The Tateyama family resided in the town of Kailua Maui and ran a small general store. Mr. Tateyama worked for EMI, and was responsible for keeping water ditches around Puohokamoa and Waikamoi clear of debris. Tateyama family members mention that their home was mauka of the Kōlea Stream where Mr. Tateyama planted a variety of Japanese bamboo and fruits. Another couple interviewed during the survey provided interest in the bamboo shoots around Kōlea Stream. The couple commented that they frequent the stream to harvest the edible bamboo shoots regularly.

Other traditional insights were provided during the survey as Kōlea Stream provided natural materials good for using as stone tools.

Research into the land use patterns of the surrounding vicinity indicated that the area was used for pre-contact agricultural pursuits, permanent and temporary habitation, traditional ceremonies, as well as taro and rice cultivation. Previous historical findings around this site have been destroyed by plantation people. Thus, the project will not have an adverse impact on those findings and sites.

4.7.1 Impacts

Other than the historical nature of the features of the reservoir that was built in 1901, no adverse impacts are expected on archaeological resources in the vicinity of the project. However, during construction, if archaeological resources are uncovered, such as burials, construction will cease and the State Historic Preservation Division and the Burial Council will be consulted. Access to the bamboo forest will remain unblocked, however it is a construction site and proper safety precautions should be observed for anyone that chooses to enter the area.

4.7.2 Mitigation

As recommended in the Archaeological Inventory Survey, the Architectural Inventory Survey (AIS) should be submitted to the State Historic Preservation Division (SHPD) to make a determination if the AIS satisfies the requirements of SHPD's Historic Architecture Branch. Best management practices for stream restoration will be followed during the decommissioning process of Kōlea Reservoir. Stream Restoration will take place where the reservoir exists to eliminate the artificial impoundment. The length of the stream that will be restored is approximately 570 feet long.

4.8 Architectural Resources

A historic property and architectural inventory survey of Kōlea Reservoir was completed on February 23, 2010 by Mason Architects Inc and is included in Appendix B. The Kōlea Reservoir, dam, and spillway occupy about 2.3 acres within the total 2121.85 acres of TMK (2)1-1-001:050 and was constructed between 1900 and 1901.

The survey documented all the components of the Kōlea Dam and described their method of construction or design. All features identified were: the reservoir, the dam embankment, the catwalk, two outlet valves, spillway, diversion structure, and center ditch. Each feature and the surrounding property was analyzed for historic integrity and undiminished qualities in terms of location, setting, design, materials, workmanship, feeling, and association. Figure 4.3 is a sketch map of the Kōlea Reservoir from the Architectural Inventory Survey (AIS) conducted by Mason Architects.

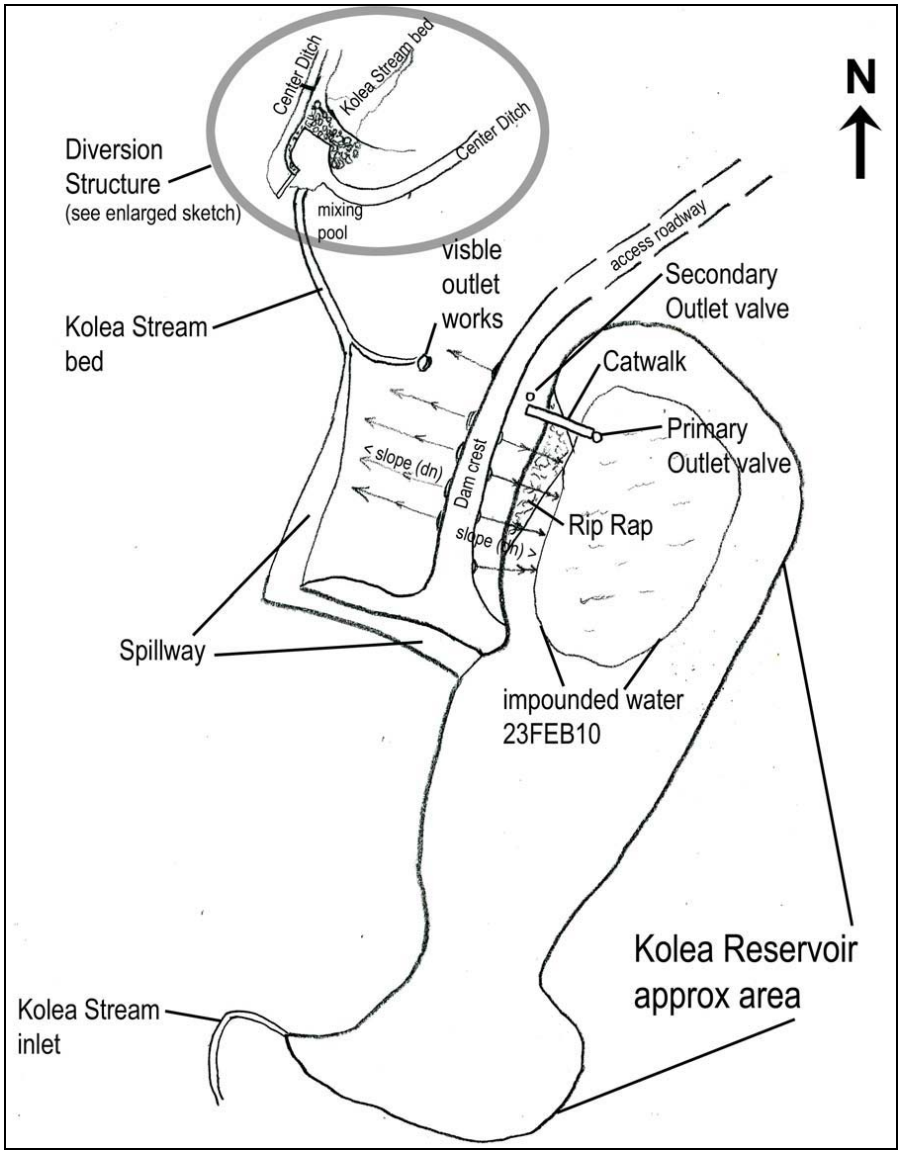


Figure 4-3. Sketch Map from AIS Report, Appendix B. Not to Scale.

The integrity of location has been retained because the location and topography of the basin is original and suitable for reservoir use. Due to the age and relation to the reservoir, the center ditch served as a water transport to the Lowrie ditch to irrigate the sugarcane fields further west.

Setting integrity has been retained because the reservoir remains in the same location and distance from the main road as when it was originally constructed and utilized. The project area remains forested; however the access road appears to have been widened sometime after the original construction. The character of the reservoir and surrounding area appear unchanged.

The design integrity has been retained primarily due to the choices made during the planning and construction process. This is evident in the dam's slopes and earthen embankment, the rip-rap wall and the spillway as they are constructed from the natural materials associated with the Kōlea Stream

area. In an effort to incorporate the reservoir water into the irrigation system, the design of the diversion system and center ditch are evidence of appropriate planning.

Material integrity has been largely retained simply because the reservoir, dam, rip-rap wall, spillway, and diversion structure are original and date to a significant time period. Even though metal portions of the diversion valve outlet have been replaced, and the catwalk was an addition, all characteristically appear to be from the same historical time period as the original construction.

Workmanship of historic techniques and construction has been retained and illustrate the labor and skill involved to construct the reservoir. The reservoir, dam, earthen rip-rap wall, and rock carved spillway are concurrent with the construction methods of the time period that the reservoir was built. Similar workmanship continues with the catwalk installation sometime after the original construction.

The integrity of feeling is maintained because the associated features of the reservoir strongly convey its historical character. The reservoir's physical qualities evoke a certain feeling associated with the 1900's time period.

The aspect of association is evident in the Kōlea Reservoir because it is a site important to the irrigation history of sugarcane on Maui and it is sufficiently intact to convey that relationship to an observer. Integrity of association is retained.

Association integrity of the Kōlea Reservoir is retained because the reservoir is intact and conveys historical significance of the sugarcane industry. Historically, the diversion was used to divert an average of 160 mgd (million gallons/ day) and was capable of 445 mgd for agriculture irrigation.

All aspects of integrity are still present in the Kōlea Reservoir property to retain its significant identity and to be listed in the National Register. Even though some features of materials and workmanship have been altered, integrity still remains. The Kōlea reservoir property can be classified under two criteria of the National Register:

A. *Property is associated with events that have made a significant contribution to the broad patterns of our history.*

C. *Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.*

Under the National Register "Criterion A" the Kōlea Reservoir has state and local significance for its association with the development of the sugar industry in Hawai'i and on Maui. Constructed ditches and reservoirs were key to sugarcane growth because of the amount of water required for the two year crop growth period. The Kōlea Reservoir also has significance under "Criterion C" as a good example of a small earth fill dam and reservoir constructed during the late 19th century and early 20th century in Hawai'i. Earth filled dams are the most popular type of dams constructed in Hawai'i and account for 95% of dams in Hawai'i. The Kōlea Reservoir upholds historical significance because it was built before standard engineering practices were established and is a great representation of materials, method of construction, craftsmanship, and design available during the time of construction.

4.8.1 Impacts

The Architectural Impact Survey (AIS) determined that there is no immediate threat to the safety of the dam. Currently, the dam serves little to no economic value as it did in the past and Mason Architects, Inc. recommends dam abandonment because it is no longer serving its original purpose.

4.8.2 Mitigation

At this time, no mitigation is planned for The Kōlea Reservoir. DLNR and SHPD have a Programmatic Agreement that requires the preparation of an Architectural Inventory Survey (AIS) Report for all dam decommissioning projects. The AIS report has been submitted to SHPD. If the AIS is accepted by SHPD as proper documentation for the historic features, the catwalk and valve control wheel will be removed and the two outlet pipes abandoned in place and plugged.

4.9 Visual Resources

There have been no visual resources identified or evaluated at the project site. The project is located where the potential for impacting any views in rare since human contact is limited to the reservoir owners.

4.9.1 Impacts and Mitigation

No adverse impacts are expected from the reservoir remediation so no mitigation is planned

4.10 Air Quality and Noise

The State Department of Health, Clean Air Branch, monitors ambient air in the State of Hawai`i via 14 air monitoring stations on three islands. O'ahu has six monitoring stations, Big Island has seven and there is one on Maui. The Environmental Protection Agency has set standards for six pollutants: 1) carbon monoxide; 2) nitrogen dioxide; 3) sulfur dioxide; 4) lead; 5) ozone; and 6) particulate matter ($PM_{2.5}$ and PM_{10}). Particulate matter is measured in microns. The subscript 2.5 and 10 represents microns in aerodynamic diameter. Because of volcanic activity, the State has also set standards for hydrogen sulfide, which is monitored on the Big Island. The monitoring station on Maui is mainly to measure the air quality impacts from agricultural activities while only particulates (PM_{10}) ($PM_{2.5}$) are measured.

The State has set more stringent standards for nitrogen dioxide and carbon monoxide. The Federal standard for nitrogen dioxide is 100 $\mu g/m^3$ (micrograms per cubic meter of air) whereas the State standard is 70 $\mu g/m^3$. For Carbon Monoxide, the 1-hour Federal standard is 40,000 $\mu g/m^3$ and the State standard is 10,000 $\mu g/m^3$.

According to the 2006 annual summary none of these pollutants exceeded State or Federal standards in the last 3 years from 2006 to 2008. Ambient air quality in the State of Hawai`i continues to be the one of the best in the nation.

Noise pollution is regulated by the State Department of Health which has set specific decibel levels into three classes based on land use. Hawai`i Administrative Rules Title 11, Chapter 46, Community Noise Control contains the specific sound levels in dBA and is shown in Table 1.

Table 4-1. Maximum Permissible Sound Levels in dBA

Zoning District	Daytime (7 a.m. to 10 p.m.)	Nighttime (10 p.m. to 7 a.m.)
Class A	55	45
Class B	60	50
Class C	70	70

Class A zoning district are lands zoned residential, conservation, preservation, public space, open space, or similar type. Class B lands are zoned for multi-family dwellings, apartment, business, commercial, hotel, resort, or similar. Class C includes lands zoned agriculture, country, industrial, or similar types. Since the reservoir is located in a conservation zoned area, Class A has been identified as the standard to use for this assessment.

Noise levels cannot exceed the dBA identified above for more than 10 percent of the time within any twenty minute period, except by permit or variance. Impulsive noise shall be ten dBA above the maximum permissible sound levels. Impulsive noise includes activities such as hammering, pile driving, and explosion. Construction equipment with a motor and/or exhaust system shall operate with a muffler, except for pile hammers or pneumatic hand tools weighing less than fifteen pounds.

4.10.1 Impacts

In the immediate vicinity of the construction activities, short term impacts on air quality are anticipated from the movement and excavation of dirt and rocks to deconstruct the reservoir. Release of particulate matter is not expected to be excessive since most of the dirt that will be moved will probably be wet. Particulate matter from dried dirt could become airborne as it is backfilled.

Short term noise impacts are also associated with construction activity. Heavy equipment will be used to backfill the reservoir and remove rocks from the reservoir walls. However, there are no residential areas in close proximity to the project site, so no adverse impact from construction noise is expected.

4.10.2 Mitigation

The construction site will be watered down periodically to prevent particulate matter from becoming airborne during construction. Dust screens may also be used to protect the construction site from exposure to wind and to also minimize airborne particulate matter. Temporary and permanent erosion controls will be in place. Once the project is completed, the air quality in the area will not be different from the existing conditions.

Noise impacts will also be generated from construction equipment. Curfew times for construction will be established and mufflers will be used on equipment to minimize noise from construction equipment. Again these impacts are short term and will occur during construction. After construction is completed, no noise impacts will be generated by the project.

Page Intentionally Left Blank

5 Social and Economic Factors

This section describes the social and economic environment of the Hāna area where the reservoir remediation will take place. Factors such as demographic characteristics and economic context are of Hāna and Maui County are used, because there is nobody living in the immediate vicinity of the project site.

5.1 Social Factors

Population of the County of Maui was 143,691 people according to the 2000 U.S. Census. This represents only 11.15 percent of the total population of the State of Hawai`i. Hāna district had a population of 1,855 people. The average number of people per household on the island of Maui in 2008 was 2.91 people.

The largest ethnic population of Maui is White with 59,640 people, followed by Asian with 55,656 people. Native Hawaiian and Pacific Islander are the third largest ethnic population with 27,835 people. These numbers represent people that declared one race on the 2000 U.S. Census Survey.

Housing units in Maui County in year 2007 totaled 43,507compared to 403,240 units in the State. Owner occupied units totaled 28,157 units and renter occupied units totaled 20,793 unit. Vacant units totaled 17,274. Homeowner vacancy rate was 2.3 percent while the rental vacancy rate was 28.8 percent. The median value of housing units in Maui County in 2000 was $249,900.

5.1.1 Impacts and Mitigation

Remediation of Kōlea Reservoir is not expected to have adverse impacts on the social environment on Maui. Thus no mitigation is planned.

5.2 Economic and Fiscal Factors

Civilian labor force for Maui County in 2008 is estimated at 80,150 people. The labor force is comprised of persons 16 years of age and over. Maui has the second smallest labor force compared to the other three counties. O'ahu has the highest with a labor force of 454,050 people. In Maui County 76,550 people make up the employed labor force. The unemployment rate is 4.5 percent. The median household income in 2007 was $60,435 in Maui County compared to $62,613 for the State of Hawai'i.

Leisure and hospitality industry has the highest number of jobs at 22,200. These jobs include arts, entertainment, recreation, accommodation, food services, drinking places and full-service restaurants. The second highest job count was the Trade, Transportation, and Utilities industry with 14,500 jobs. These jobs include wholesale and retail trade, transportation, warehousing, air transportation and utilities. Government (Federal, State, and Local) accounted for the third highest job count of 9,500. The job count in the agricultural industry was in the lowest with 1,700 jobs.

There were 1,156 farms in Maui County in 2007 covering 225,568 acres. The average farm size was 195 acres. Farms between 1 to 9 acres were the most abundant with 766 farms followed by 289 farms between 10 to 49 acres. Crop lands totaled 54,557 acres with the remaining in harvested and irrigated

cropland. Agricultural products sold include Crops, nursery and greenhouse crops, livestock, poultry and their products.

5.2.1 Impacts

Long-term adverse impacts on the economy are not expected from the remediation of the Kōlea Reservoir. Short term positive impacts are expected from direct and indirect employment and supplies needed to deconstruct the reservoir.

5.2.2 Mitigation

No mitigation is needed on the economic environment of the project since the project is relatively small and will have a short term positive impact on the economy.

6 Infrastructure, Public Facilities, and Utilities

This section describes the existing infrastructure, public facilities, and utilities in the vicinity of the project site and any adverse impacts that the project will have. Water, wastewater, drainage, solid waste, transportation, electric, telephone, cable, medical, schools, police, and fire will be addressed in this section.

6.1 Water, Wastewater, Drainage, and Solid Waste

Services provided by the County of Maui include water, wastewater, drainage, and solid waste. Water is managed by the Department of Water Supply. Deconstruction of the Kōlea Reservoir will not impact the water supply or distribution systems in the area.

Wastewater facilities are handled by the County of Maui, Environmental Management Wastewater Division. According to the Maui General Plan 2030, there are no identified public utility sewer lines or wastewater treatment plants installed near the project site. The project will not have an impact on the wastewater facilities or sewer lines.

Nearby drainage consists mainly of surface runoff from streams which flow into the ocean. No increase in runoff is expected from the project. Storm water runoff near the project currently flows through the spillway and into the stream.

The County maintains an island-wide system of solid waste collection and disposal. Hāna Landfill is the closest disposal site approximately 2 miles northwest of the reservoir for solid waste with refuse transfer stations. The deconstruction of the Kōlea Reservoir is not expected to have an adverse impact on solid waste facilities. Rocks from the existing reservoir will be reused to infill the reservoir.

6.1.1 Impacts and Mitigation

The removal of the Kōlea reservoir is not expected to have an adverse impact on water, wastewater, drainage, or solid waste facilities. However, all construction debris shall be removed from the site and disposed of accordingly. Because there are no impacts on public facilities, no mitigation is planned.

6.2 Transportation

Hāna Highway is the main vehicular access to this area and is under the jurisdiction of the State Department of Transportation. There is a small dirt service road off of Hāna Highway that leads to the dam. The deconstruction of the reservoir is not expected to have an impact on existing roadways since the construction site is located inland from the main highway. Equipment and staging areas will be located in the vicinity of the reservoir and will not impede traffic flow on Hāna Highway.

6.2.1 Impacts and Mitigation

The deconstruction of the Kōlea reservoir is not expected to have an adverse impact on transportation facilities. Equipment and staging areas will be located in the vicinity of the reservoir and will not impede traffic flow on Hāna Highway. If oversized and overweight equipment or loads are going to be used on State highways, the Contractor will be required to obtain a permit from the Department of Transportation, Maui District Office.

6.3 Power and Communications

Electricity is provided by Maui Electric Company, and telephone communications are provided by several private companies. Oceanic Time Warner Cable provides cable TV service. The reservoir deconstruction will not require electricity, telephones or cable service.

6.3.1 Impacts and Mitigation

Since the project will not require electricity, telephone, or cable services, no impacts on these systems are expected and no mitigation is required.

6.4 Medical, Schools, Police, and Fire

The nearest medical facility in the area is Hāna Community Medical Center located approximately 24 miles southeast in the town of Hāna. Public schools include Hāna School, Keʻanae Elementary School, Kamehameha Center-Based Pre-School, and Hāna High School. A police station and fire station are located along Hāna Highway in the town of Hāna. Because of the distance between Kōlea Reservoir and the town of Hāna, no effects on these facilities are expected from the project.

6.4.1 Impacts and Mitigation

No impacts on medical, schools, police, and fire are expected. Thus no mitigation is required.

7 Conformance with Plans and Policies

This section will describe the relationship of the project to applicable State and County policies. Only those policies related to the proposed reservoir remediation will be described.

7.1 Hawai`i State Plan and Functional Plans

The Hawai`i State Plan was developed to serve as a guide for future development of the State of Hawai`i in areas of population growth, economic benefits, enhancement and preservation of the physical environment, facility systems maintenance and development, and socio-cultural advancement. The Plan identifies, in general, the goals, objectives, policies and priorities for the development and growth of the State.

Twelve Functional Plans were also developed to further define the goals and objectives of the Hawai`i State Plan. The twelve functional plans include: 1) Agriculture; 2) Conservation Lands; 3) Employment; 4) Energy; 5) Health; 6) Higher Education; 7) Historic Preservation; 8) Housing; 9) Recreation; 10) Tourism; 11) Transportation; and 12) Water Resources Development.

Functional plans that have a positive or adverse impact from the proposed reservoir remediation are Agriculture, Conservation lands, Water resource development, Employment and Historic Preservation.

7.1.1 Agricultural Functional Plan

The issues of concern in the Agriculture Function Plan are:

Growth and development of diversified agriculture throughout the State, that continues to constitute a dynamic and essential component of Hawai'i's strategic, economic, and social well-being.

Support research and development activities that strengthen economic productivity in agriculture, stimulate greater efficiency, and enhance the development of new products and agricultural by-products.

Deconstruction of the project will have an adverse impact on agriculture because the reservoir will no longer store water for the purpose of agriculture irrigation. However, the reason the reservoir is being removed is because it is no longer being used for agriculture water storage and for dam breach safety measures.

7.1.2 Conservation Lands Functional Plan

The issues of concern in the Conservation Lands Function Plan are:

Preserve agricultural lands, open space, and conservation lands;
Integrate "smart growth" principles for urban growth;
Develop sustainable communities;

Although classified in the conservation district deconstruction of the project will have a positive impact on conservation lands because removing the reservoir will return the stream to a more natural state. Agriculture irrigation is no longer needed from this reservoir.

7.1.3 Water Resource Development Functional Plan

The issues of concern in the Water Resources Development Function Plan are:

Coordinate development of land use activities with existing and potential water supply;
Support research and development of alternative methods to meet future water requirements;
Reclaim and encourage the productive use of runoff water and wastewater discharges;
Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use;
Support water supply services to areas experiencing critical water problems.
Promote water conservation programs;

The Water Resource Development Plan encourages the use of alternative water supplies and the reuse of storm water. Kōlea Reservoir has a capacity of about 8 million gallons and is distant from any potential users. Its small size and relative isolation make it unsuitable for storage of storm water or alternative water sources.

Deconstruction of the project will have positive impact on water resource development because the reservoir will no longer store water for the purpose of agriculture irrigation. The reservoir that allows water to be stored will be breached so that water will flow more naturally into the stream.

7.1.4 Employment Functional Plan

The major issues of concern for the Employment Functional Plan are:

Improve the qualifications of entry-level workers and their transition to employment;
Develop and deliver education, training and related services to ensure and maintain a quality and competitive workforce;
Improve labor exchange;
Improve the quality of life for workers and families; and
Improve planning of economic development, employment and training activities.

Construction of the project will have a short-term positive impact on employment by providing direct and indirect jobs. After construction is completed, no new jobs will be created.

7.1.5 Historic Preservation Functional Plan

The issues of concern in the Historic Preservation Function Plan are:

Preservation of historic properties;
Collection and preservation of historic records, artifacts and oral histories and perpetuation of traditional skills;
Public information and education on the ethnic and cultural heritages and history of Hawai`i;

Historic and cultural resources were found to be a characteristic of the Kōlea Reservoir features. The AIS and Archaeological reports were submitted to the State Historic Preservation Office (SHPD) for approval. Construction of the project will have an adverse impact on historic preservation because the remediation effort will deconstruct the reservoir from its original construction.

7.2 County of Maui General Plan

The General Plan for the County of Maui was last adopted in 1980, and has been updated in 1990. The purpose of the General Plan is to recognize and state the major problems and opportunities concerning the needs and the development of the County and the social, economic, and environmental effects of such development. The plan seeks desired sequence, patterns and characteristics of Maui County development.

The Maui County General Plan is guided by five major themes: 1) Protect Maui County's agricultural land and rural identity; 2)Prepare a directed and managed growth plan; 3) Protect Maui County's shoreline and limit visitor industry growth; 4) Maintain a viable economy that offers diverse employment opportunities for residents; and 5) Provide for needed resident housing. The proposed project is most closely supportive of Theme No. 1: Protect Maui County's agricultural land and rural identity plan. This theme supports quality agriculture lands and product growth to keep up with the demand. Because agricultural irrigation is no longer needed from this reservoir, the removal of the reservoir will not impact agricultural operations. By removing the reservoir, the steam will be returned to a more natural state preserving the identity of the land.

7.3 County of Maui General Plan 2030 (Draft)

The County of Maui Department of Planning has been updating its General Plan to form the Maui General Plan 2030. The General Plan 2030 initiative has put forth that the Countywide Policy Plan, Maui Island Plan and Community Plans will comprise the future General Plan which will guide future growth and policy creation in the County. The current December 2009 draft versions of the Countywide Policy Plan and the Maui Island Plan are available for review. The proposed project will be evaluated further with respect to these Draft Countywide Policy Plan and Draft Maui Island Plan in the FEA. Evaluation of the project with respect to the adopted Hāna Community Plan is provided below.

7.4 Maui County General Plan 2030, Countywide Policy Plan March 2010

The County of Maui Countywide Policy Plan (2010) has the following eleven goals: 1) Protect the Natural Environment; 2) Preserve Local Cultures and Traditions; 3) Improve Education, 4) Strengthen Social and Healthcare Services; 5) Expand Housing Opportunities for Residents; 6) Strengthen the Local Economy; 7) Improve Parks and Public Facilities; 8) Diversify Transportation Options; 9) Improve Physical Infrastructure; 10) Promote Sustainable Land Use and Growth Management; 11) Strive for Good Governance.

The proposed project is most supportive of themes 1) Protect the natural environment, 2) Preserve local cultures, and traditions; and 9) Improve physical infrastructure in coordination with 8) Diversify Transportation Options; 10) Promote sustainable land use and growth. By removing Kōlea Reservoir, Kōlea Stream will be restored to a more natural state protecting the unique terrain, and its geological features. Even though Kōlea Reservoir is breached, the proposed project does not remove any of the bamboo plants considered invasive for this area. The site will still be accessible to the few visitors who collect parts of the bamboo plant for their cultural traditions. Lastly, the proposed project works to improve physical infrastructure and transportation by breaching the dam to remove the potential future safety hazards that motorists along Hāna Highway would be affected by if the dam should fail.

The proposed project does not support the local economy in regards to agriculture, because breaching the dam removes the storage capacity originally used for agriculture. Removing the dam will not affect the economy of agriculture. Conversely, the EMI diversion structure below the dam will remain in place, and any water that enters through it, is diverted through the diversion channel. Sustainable land use and growth management will be achieved by protecting the agriculture identity as well as the conservation district land use. The proposed project does not call for major development on the site but moreover allows for the site to return to a more natural state.

7.5 Hāna Development Plan 1994

To further guide how each district should grow, the Development Plans were developed to provide more detailed guidance for development in each of Maui County's nine districts. These plans are an expression of community values and provide form and substance to the goals and aspirations of those who live, work, and play in an area. The four main problems identified in the plan are: 1) Affordable Housing; 2) Economic Opportunity; 3) Infrastructure; 4) Government Service. Three additional opportunities were identified in the plan: 1) Lifestyle; 2) Environment; 3) Coastal Resources.

The proposed project is most supportive of the identified Problem No. 3: Infrastructure plan. This theme supports quality infrastructure related features to keep the public safe, while preserving the natural environment of Hāna. The removal of the reservoir is ideal because agricultural irrigation is no longer needed from the reservoir and therefore does not need to remain in place as a potential safety hazard for the public. The opportunity most supported in the reservoir remediation project is the environment. The reservoir remediation will return the stream to its natural state for future generations to enjoy.

8 Significance Criteria

To determine whether a proposed action may significantly affect the environment, it needs to consider every phase of the action, the expected primary and secondary consequences, and the cumulative as well as the short and long-term effect of the action. Therefore, evaluation of the significance criteria determines if there are any significant impacts on the environment. The following criteria are used to determine significance of project activities, if any.

(1) Involves an irrevocable commitment to loss or destruction of any natural or cultural resource;

The project will result in the irrevocable destruction of a cultural resource but will not be done without the approval and thorough documentation of the SHPD.

(2) Curtails the range of beneficial uses of the environment;

The removed reservoir will preserve the beneficial uses of the environment by allowing the stream to flow naturally.

(3) 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 project will not conflict with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS. Evaluation of the construction activity described in this EA shows that the project will not have long-term negative impacts. Short-term negative impacts will occur during construction from noise, dust and turbidity in the water. However, these impacts can be mitigated by the use of best management practices (BMP) such as mufflers on equipment, frequent watering to keep dust down, and control of construction material including rock and sand. Permanent BMPs include grassing the project site and including check dams to reduce sediment loss.

(4) Substantially affects the economic or social welfare of the community or state;

The project will have a short-term positive effect on the economy from jobs and increased revenue during construction. However, after construction the remediated reservoir will not directly affect the economy. The project also will not affect the social welfare of the community or the state.

(5) Substantially affects public health;

Deconstruction of the reservoir will alleviate any potential for safety hazards from dam breaks or leaks.

(6) Involves substantial secondary impacts, such as population changes or effects on public facilities;

The reservoir remediation will have no impact on population, but will make the Hāna Highway safer for vehicular traffic in the event of a dam breach.

(7) Involves a substantial degradation of environmental quality;

The removal of the reservoir will not substantially degrade environmental quality. The remediation project will actually reduce loss of topsoil into the ocean with the permanent erosion controls in place.

(8) Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions;

The project is not part of a larger action and will not contribute to cumulative adverse environmental effects on the environment. The dam removal does not trigger any commitment for larger actions.

(9) Substantially affects a rare, threatened, or endangered species, or its habitat;

The construction for the reservoir remediation will not affect any endangered species or their habitat. Of the species observed, none were on the state or federal endangered species list. Most species observed were invasive species.

No lighting is planned for the construction work that would affect the flight of birds. Thus no impact on these nocturnally flying birds is expected.

There were no threatened, rare or endangered botanical resources seen in the vicinity of the project. Therefore, no negative impacts on endangered plants are expected during or after construction.

(10) Detrimentally affects air or water quality or ambient noise levels;

Short-term impacts on air quality and noise levels will occur during construction. However, when the construction is completed, no long-term effects on air quality and noise level are expected.

Breaching of the dam may temporarily increase turbidity in the stream waters. Best management practices will be implemented to minimize the effects of turbidity or other pollutants.

(11) Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters;

The planned reservoir remediation is not classified in an environmentally sensitive area but rather in a conservation area. A boulder beach occurs naturally at the stream mouth approximately at the bottom of a 200 foot sea cliff. The threat from erosion and coastal flooding is no different from the reservoir being in place. By placing erosion controls around the project area, erosion will be mitigated from traveling down to coastal waters.

(12) Substantially affects scenic vistas and view planes identified in county or state plans or studies;

The Kōlea Reservoir is not within an identified view plane. Visitors are sparse to the private property reservoir. No view will be obstructed with the reservoir removal.

(13) Requires substantial energy consumption.

The reservoir remediation project is not dependent on electricity and will not have an impact on energy consumption. Construction equipment will use fuel to work. When construction is completed, no other energy will be needed.

8.1 Anticipated Determination

A Finding of No Significant Impact (FONSI) determination is anticipated for the project based upon the information provided in this EA document. The results of the assessments conducted have determined that there will be no significant negative impact from the removal of the reservoir.

Page Intentionally Left Blank

9 Permits and Approvals

This section lists the anticipated permits and approvals that will be required to remove the Kōlea Reservoir and return the area back to a more natural state.

9.1 Permits Required

Table 9.1 lists the permits that will be required to restore the existing reservoir to its natural state. Other agency approvals are also shown below.

Table 9.1 Table 9-1. Permits Required

Permit	Agency Approval
National Pollution Discharge Elimination System (NPDES), General Form C	State of Hawai'i Department of Health, Clean Water Branch
Section 401 Water Quality Certification	State of Hawai'i Department of Health, Clean Water Branch
Conservation District Use Permit (CDUP)	State Department of Land and Natural Resources, Office of Conservation and Coastal Lands
Dam Safety Permit	State Department of Land and Natural Resources, Engineering Division
Stream Channel Alteration Permit (SCAP)	State Department of Land and Natural Resources, Commission of Water Resource Management
Stream Diversion Works Abandonment Permit	State Department of Land and Natural Resources Commission on Water Resource Management
Section 404 Permit	U.S. Army Corps of Engineers
Approval of Archaeological Report	State Department of Land and Natural Resources, Division of Historic Preservation
Approval of Architectural Report	State Department of Land and Natural Resources, Division of Historic Preservation
Coastal Zone Management Certification	State of Hawai'i Department of Business & Economic Development & Tourism

If oversized and overweight equipment or loads are going to be used on State highways, the Contractor will be required to obtain a permit from the Department of Transportation, Maui District Office.

Page Intentionally Left Blank

10 Bibliography

College of Tropical Agriculture and Human Resources. Soil Nutrient Management for Maui County. *Soil Orders of Maui County.*(2007).University of Hawai'i.
http://www.ctahr.Hawai'i.edu/mauisoil/maui.aspx

Department of Business, Economic Development & Tourism. (2006). *2005 State of Hawai'i Data Book: A statistical abstract*. Honolulu: Author.

Department of Business, Economic Development & Tourism. (1988). *Chapter 226 HRS, Hawai'i State Planning Act*. Office of Planning, State of Hawai`i. Honolulu.

Department of Health. (2006). *Annual Summary 2006 Hawai'i Air Quality Data*. Clean Air Branch, State of Hawai`i

Department of Health. HAR Title 11, Chapter 46, Community Noise Control. State of Hawai`i.

Department of Land and Natural Resources.(2007). State of Hawai'i Conservation District Subzones-Islands of Maui & Kahoolawe. State of Hawai'i.

Department of Land and Natural Resources.(May 28, 2010). News Release: State Water Commission Decision Balances Competing Demands. State of Hawai'i.

Department of Planning.(2009). *Maui Island Plan: General Plan 2030 DRAFT*. County of Maui.

Department of Planning.(2010). *Maui County General Plan 2030, Countywide Policy Plan.* County of Maui.
Holt, Alan. "The Maui Forest Trouble: A Literature Review and proposal for Research." University of Hawai'i at Manoa, Department of Botany. 1983.
http://www.hear.org/articles/pdfs/tmftholt1983.pdf

Juvik, S.P., & Juvik, J.O. (Eds.) (1998). Atlas of Hawai`i. Honolulu: University of Hawai'i Press.

Office of Economic Development.(2009). *Maui County Data Book 2009*. County of Maui.

State of Hawai'i, Commission on Water Resource Management, Department of Land and Natural Resources, Division on Water Resource Management. *Registration of Stream Diversion Works and Declaration of Water Use: Kōlea Reservoir and Center Ditch.* May 26, 1989.

Zoning and Enforcement Division. (1994).*Hāna Community Plan 1994*. Maui County Council

Page Intentionally Left Blank

APPENDIX A

Archaeological & Cultural Surveys

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

July 27, 2010

Hallett H. Hammatt, Ph.D.
Cultural Surveys Hawai'i, Inc.
PO Box 1114
Kailua, Hawaii 96734

LOG NO: 2010.1975
DOC NO: 1007MD27
Archaeology

Dear Dr. Hammatt:

SUBJECT: Chapter 6E-8 Historic Preservation Review –
Archaeological Inventory Survey of Four Acres with One New Site
Kolea Ahupua'a, Hāna District, Island of Maui
TMK: (2) 1-1-001:050 (por.)

This letter reviews the aforementioned report (McCurdy and Hammatt March 2010*; Archaeological Inventory Survey Report for the Kolea Reservoir Decommissioning Project, Kolea Ahupua`a, Hana District, Maui Island, TMK: [2] 1-1-001:050; CSH Job Code: MAKAIWA 1*), which we received on May 10, 2010. We apologize for the delay in our reply.

The project area of the survey encompasses the Kolea Dam, newly recorded as SIHP 50-50-13-6683, a Plantation-era reservoir that was hand-constructed in 1910. It is being decommissioned as a water storage facility at this location because it is no longer needed.

This was the first reservoir built following the annexation of Hawaii by the United States in 1898. It has been recommended significant under criteria "a" (association with a period of great change in Hawaii followed by an influx of immigrant contract labors due to the water availability for improved crop yields); "c" (for its distinctive style and hand-built construction); and "d" for information important to the understanding of water diversion techniques and structures employed during the early plantation period on Maui. We concur with these recommendations. We also agree that the next step is to begin an architectural inventory survey in consultation with our Architecture Branch.

This report is approved as final pursuant to HAR §13-276. Upon receipt of this letter please submit one paper copy of your plan marked "Final" to our Kapolei office along with a CD containing a searchable pdf version of the final report and a copy of this approval letter, marked to the attention of the "**Kapolei Library.**" If you have questions about this letter please contact Morgan Davis at (808) 896-0514 or via email to: morgan.e.davis@hawaii.gov.

Aloha,

Theresa K. Donham
Acting Archaeology Branch Chief
State Historic Preservation Division

Archaeological Inventory Survey Report for the Kolea Reservoir Decommissioning Project, Kolea Ahupua‘a, Hāna District, Maui Island TMK: [2] 1-1-001:050

Prepared for
Oceanit Laboratories, Inc.

FINAL

Prepared by
Todd C. McCurdy, M.A.
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai‘i, Inc.
Kailua, Hawai‘i
(Job Code: MAKAIWA 1)

March 2010

O‘ahu Office
P.O. Box 1114
Kailua, Hawai‘i 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Maui Office
1993 Main Street
Wailuku, Hawai‘i 96793
Ph: (808) 242-9882
Fax: (808) 244-1994

Management Summary

<table>
<tr><td>Reference</td><td>Archaeological Inventory Survey Report for the Kolea Reservoir Decommissioning Project, Kolea Ahupua’a, Hāna District, Maui Island, TMK: [2] 1-1-001:050 (McCurdy and Hammatt 2010)</td></tr>
<tr><td>Date</td><td>March 2010</td></tr>
<tr><td>Project Number (s)</td><td>Cultural Surveys Hawai‘i Inc. (CSH) Job Code: MAKAIWA 1</td></tr>
<tr><td>Investigation Permit Number</td><td>The fieldwork component of the archaeological inventory survey documentation was carried out under archaeological permit # 10-10 issued by the Hawai‘i State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR), per Hawai‘i Administrative Rules (HAR) Chapter 13-282.</td></tr>
<tr><td>Project Location</td><td>The project area is approximately 430 m southwest of the Waikamoi Forest Ridge trailhead and is accessed by way of a locked gate in the parking area for the trail.</td></tr>
<tr><td>Land Jurisdiction</td><td>State Ownership, Department of Land and Natural Resources (DLNR). Leased by East Maui Irrigation Company, Ltd. (EMI)</td></tr>
<tr><td>Agencies</td><td>State: Hawai‘i Department of Land and Natural Resources</td></tr>
<tr><td>Project Description</td><td>The current project involves the decommissioning of the Kolea Reservoir as the water storage is no longer necessary.</td></tr>
<tr><td>Project Acreage</td><td>4 acres (1.6 ha)</td></tr>
<tr><td>Area of Potential Effect (APE) and Survey Acreage</td><td>The project area’s Area of Potential Effect (APE) is defined as the immediate area of ground disturbance. The APE in this instance is defined as the entire project area, approximately 4 acres (1.6 ha).</td></tr>
<tr><td>Historic Preservation Regulatory Context</td><td>This document was written in accordance with Hawai‘i Administrative Rules (HAR) 13-276 and Chapters 6E-7 and 8.</td></tr>
<tr><td>Fieldwork Effort</td><td>The fieldwork component of the archaeological inventory survey was accomplished on February 23 and 24, 2010 by CSH archaeologists, Todd McCurdy, M.A. and Robert Hill, B.A., under the general supervision of Hallett H. Hammatt, Ph.D. The fieldwork required approximately 20 person-hours to complete. The inventory survey documentation included site recordation of the Kolea Reservoir and associated features.</td></tr>
<tr><td>Number of Historic Properties Identified</td><td>One Historic Property was identified during this investigation.</td></tr>
<tr><td>Historic Properties Recommended Eligible to the Hawai‘i Register of Historic Places (Hawai‘i Register)</td><td>
<table>
<tr><th>SIHP 50-50-13-</th><th>Site Type</th><th>Function</th><th>Age</th><th>Significance Criteria</th></tr>
<tr><td>6683</td><td>Plantation Reservoir</td><td>Water Diversion</td><td>Plantation era</td><td>A, C, and D</td></tr>
</table>
</td></tr>
<tr><td>Historic Properties Recommended Ineligible to the Hawai‘i Register</td><td>None observed</td></tr>
</table>

<table>
<tr><td>Effect Recommendation</td><td colspan="6"><table>
<tr><th>SIHP 50-50-13-</th><th>Site Type</th><th>Age</th><th>Significance Criteria</th><th>Recommendations</th></tr>
<tr><td>6683</td><td>Plantation Reservoir</td><td>Plantation era</td><td>A,C,D</td><td>A minimum of Architectural Inventory Survey Report Documentation.</td></tr>
</table></td></tr>
<tr><td>Mitigation Recommendation</td><td colspan="6">Cultural Surveys Hawai‘i recommends a minimum of an Architectural Inventory Survey of SIHP 50-50-13-6683 prior to any alteration, the level of recordation to be determined in consultation with SHPD Historic Architecture Branch.</td></tr>
</table>

Table of Contents

List of Figures

List of Tables

Section 1 Introduction

1.1 Project Background

At the request of Oceanit Laboratories, Inc., Cultural Surveys Hawai‘i, Inc. conducted an archaeological inventory survey for the Kolea Reservoir Decommissioning Project, Kolea Ahupua‘a, Hāna District, Maui Island, TMK (2) 1-1-001:050 (Figure 1 and Figure 2). The intent is to breach the existing dam and restore the reservoir to a natural looking environment because it has been determined that the water storage is no longer necessary. The area of potential effect (APE) is approximately 4 acres, and is hereafter referred to as the project area.

1.2 Scope of Work

The following archaeological inventory survey scope of work is designed to satisfy the Hawai‘i state requirements for archaeological inventory surveys (Hawai‘i Administrative Rules [HAR] Chapter 13-276 and Chapter 13-275/284):

1) Historic and archaeological background research, including a search of historic maps, written records, Land Commission Award documents, and the reports from prior archaeological investigations. This research will focus on the specific project area’s past land use, with general background on the pre-contact and historic settlement patterns of the *ahupua‘a* and district. This background information will be used to compile a predictive model for the types and locations of historic properties that could be expected within the project area.

2) A complete (100 %) systematic pedestrian inspection of the project area to identify any potential surface historic properties. Surface historic properties will be recorded with an evaluation of age, function, interrelationships, and significance. Documentation will include photographs, scale drawings, and, if warranted, limited controlled excavation of select sites and/or features.

3) As appropriate, consultation with knowledgeable individuals regarding the project area’s history, past land use, and the function and age of the historic properties documented within the project area.

4) As appropriate, laboratory work to process and gather relevant environmental and/or archaeological information from collected samples.

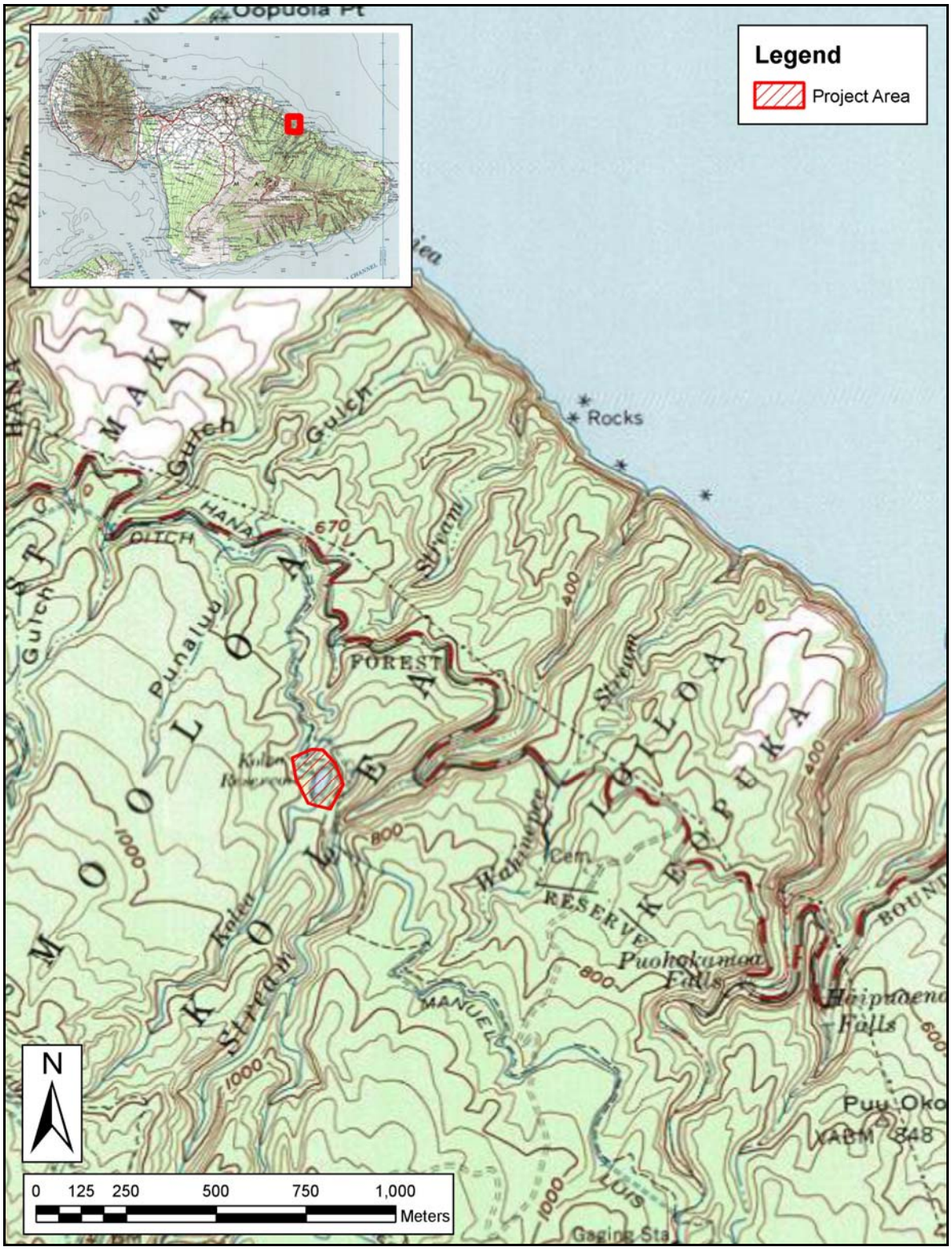


Figure 1. A portion of the USGS 7.5’ topographic map, Keanae Quadrangle (1983) showing the project area.

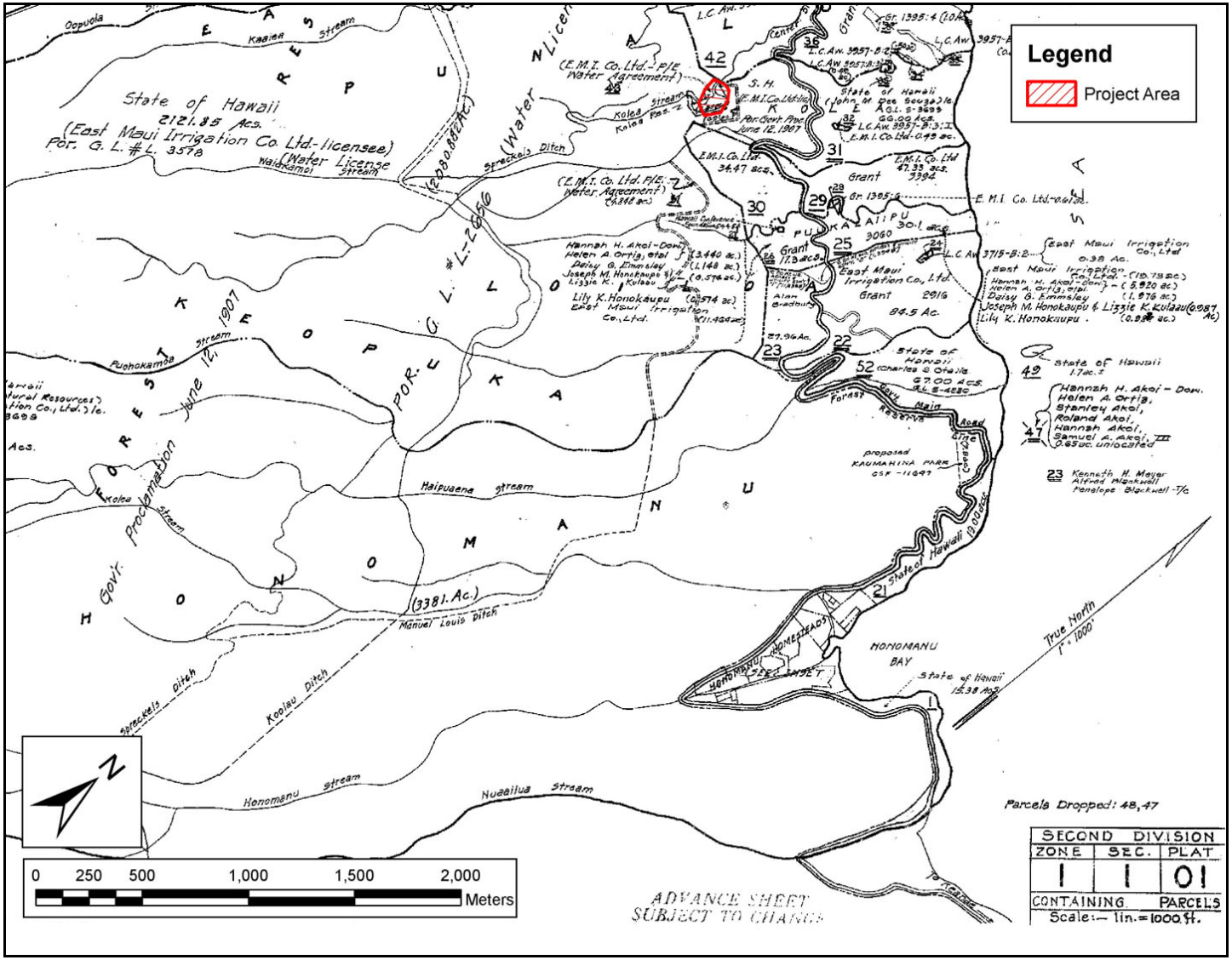


Figure 2. A portion of TMK (2) 1-1-001 showing the location of the project area.

5) Preparation of an inventory survey report, which will include the following:
   a) A project description;
   b) A section of a USGS topographic map showing the project area boundaries and the location of all recorded historic properties;
   c) Historical and archaeological background sections summarizing prehistoric and historic land use of the project area and its vicinity;
   d) Descriptions of all historic properties, including selected photographs, scale drawings, and discussions of age, function, laboratory results, and significance, per the requirements of HAR 13-276. Each historic property will be assigned a Hawai‘i State Inventory of Historic Properties number;
   e) If appropriate, a section concerning cultural consultations [per the requirements of HAR 13-276-5(g) and HAR 13-275/284-8(a) (2)].
   f) A summary of historic property categories, integrity, and significance based upon the Hawai‘i Register of Historic Places criteria;
   g) A project effect recommendation;
   h) Treatment recommendations to mitigate the project’s adverse effect on any historic properties identified in the project area that are recommended eligible to the Hawai‘i Register of Historic Places.

This scope of work includes full coordination with the State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR) and Maui County relating to archaeological matters. This coordination takes place after consent of the owner or representatives.

Part of the SHPD/DLNR mandated scope of work for an archaeological inventory survey includes specific documentation of located historic properties. This documentation includes recording their geographic location with a GPS on project area maps and written descriptions and may include, as appropriate, sampling, section drawings and profiles, plan views, and photographs. For traditional Hawaiian deposits, this can include analysis of recovered artifacts and midden. It often also includes radiocarbon dating of samples from cultural contexts. If historic-era deposits are located, then analysis of associated historic artifacts is often required.

1.3 Environmental Setting

1.3.1 Natural Environment

Kolea Ahupua‘a is located in between Mo‘oloa Ahupua‘a to the west and Loiloa Ahupua‘a to the east. The Kolea Reservoir is located along Kolea Stream at the 800-foot contour and approximately 1.15 kilometers from the coastline (Figure 1). Soils in the area are described as Rough Mountainous Land (rRT) (Figure 3). Occurring in mountainous areas throughout the Hawaiian Islands, it consists of very steep land broken up by numerous intermittent drainage channels. The stratigraphy is generally 0-25 cm of soil over saprolite. (Foote et al. 1972:119).

The average rainfall in the vicinity of the project area is between 120” and 160” with the heaviest rainfall occurring in the winter months (Giambelluca et al. 1986:57). In this region of the island the soil type and precipitation rate support a wet forest and woodland ecosystem (Pratt and Gon 1998). As a result of land alteration associated with water diversion the ecosystem has been modified. The current environment around the Ko‘lea Reservoir consists of introduced florae including Swamp mahogany (*Eucalyptus robusta*), Chinese banyan (*Ficus microcarpa*), Paperbark (*Melaleuca quinquenervia*) and Moreton Bay fig (*Ficus Macrophylla*).

1.3.2 Built Environment

The built environment consists of a reservoir and associated dam constructed in 1901 (Figure 4). A wood-framed catwalk extends from the crest of the dam approximately 12 m straight out into the reservoir with a control wheel at its end, presumably to open and close the outlet. The exiting water is re-directed from Kolea Stream into the center ditch for the purpose of irrigation. An access road that begins near the Waikamoi Forest Ridge trailhead ends atop the crest of the dam.

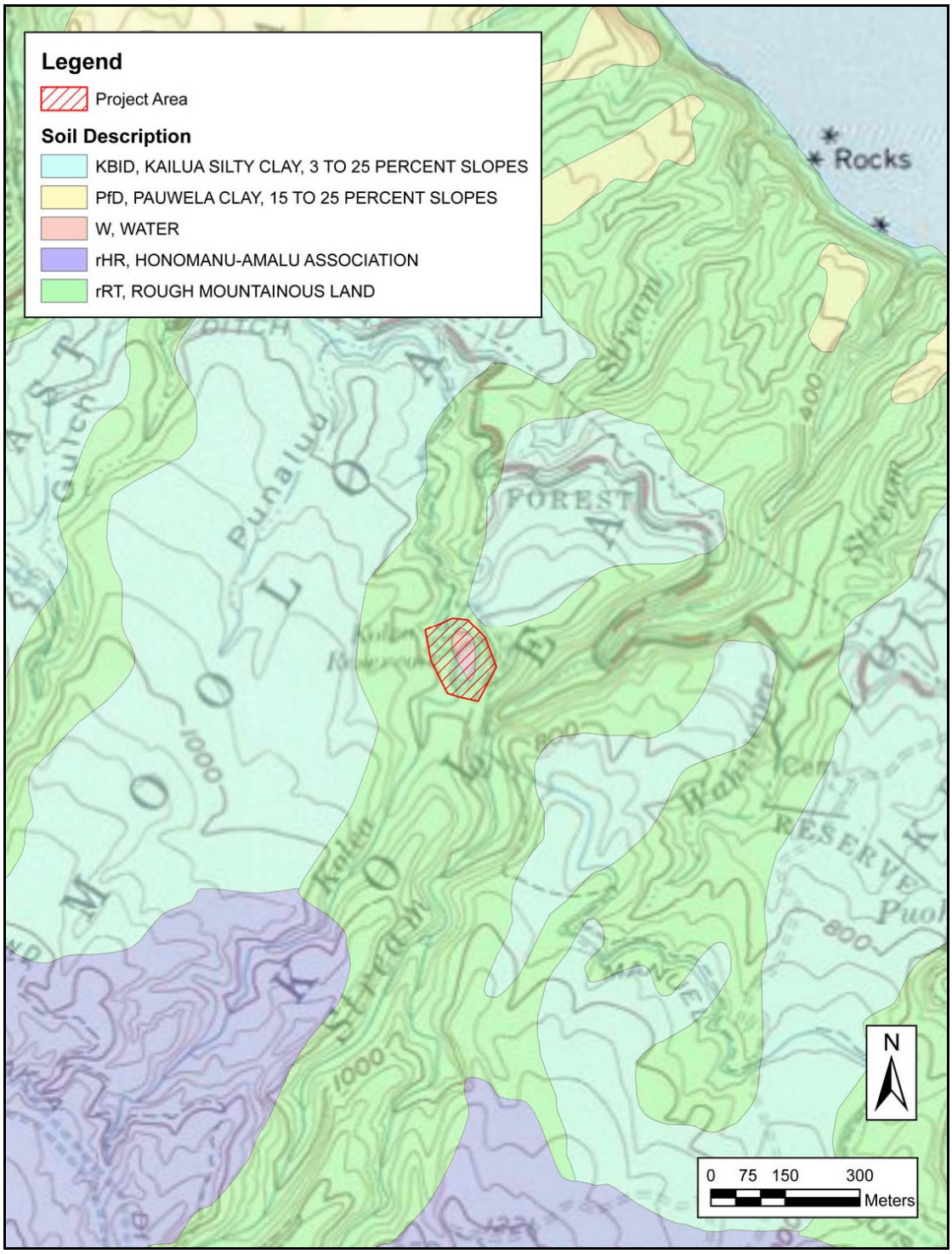


Figure 3. A portion of the 1983 Ke‘anae 7.5-minute USGS topographic quadrangles, showing the project area and related local soil series (U.S. Department of Agriculture, Natural Resources Conservation Service 2001).

Figure 4. Overview of the Kolea Reservoir, view to north.

Section 2 Methods

2.1 Field Methods

The fieldwork component of the archaeological inventory survey was accomplished on February 23 and 24, 2010 by CSH archaeologists, Todd McCurdy, M.A. and Robert Hill, B.A., under the general supervision of Hallett H. Hammatt, Ph.D. The fieldwork required approximately 20 person-hours to complete. The inventory survey documentation included site recordation of the Kolea Reservoir and associated features.

2.1.1 Site Recordation

Archaeological documentation included:

1. Mapping to scale using a tape and compass
2. Detailed written descriptions
3. Photographic documentation using an Olympus Stylus 780, resolution 7.1 megapixels
4. Site location through GPS data collection

2.2 Document Review

Background research included a review of previous archaeological studies and mitigation plans on file at SHPD/DLNR and a review of documents, books and maps at the Cultural Surveys Hawai‘i library. Land Commission Award documentation was researched using the Waihona ‘Āina online database and previous reports. Additionally, documents, books and maps were consulted at the Maui Historical Society and Wailuku Public Library. Other sources such as the World Wide Web were utilized as needed.

Section 3 Background Research

The division of Maui's lands into political districts occurred during the rule of Kaka‘alaneo, under the direction of his *kahuna*, Kalaiha‘ōhi‘a (Beckwith 1970:383). This division resulted in twelve districts during traditional times: Honua‘ula, Kahikinui, Kaupō, Kīpahulu, Hāna, Ko‘olau, Hāmākua Loa, Hāmākua Poko, Wailuku, Ka‘anapali, Lahaina, and Kula. The current project area is located on the windward flank of Haleakalā in the traditional district or *moku* of Ko‘olau and *ahupua‘a* of Kolea.

This section contains a summary of the rich traditional historic background associated with the Ko‘olau Moku. In addition, this section details the previous archaeological investigations in the vicinity of the current project area. It concludes with a background summary and predictive model.

3.1 Traditional and Historical Background

3.1.1 Mythological and Traditional Accounts

Ko‘olau Moku, on the northeast coast of Maui is located in between Hāmākua Loa Moku to the west and Hāna Moku to the south. A translation of *Ko‘olau* is "windward" (Pukui et al. 1974:117). Although Ko‘olau Moku extends from O‘opuola Pt. to beyond Nihuku, the lands from Ke‘anae to Wailua are considered to be representative of the traditional cultural landscape for the Ko‘olau region as a whole (Handy and Handy 1997:499-501).

Oral tradition passed from down from one generation to the next provides valuable insight into the pre-Contact cultural landscape of Ko‘olau Moku. The waters that feed this verdant region were said to have been brought forth by the god Kāne, who thrust his *kauila* staff into solid rock to bring forth the waters of Ke‘anae (Beckwith 1970:64). Another tale tells of a famous shark of Ko‘olau called Hi‘u (the tail of a fish) (Sterling 1998:109 and Lueras 1983:92):

> According to this story, two families in the area used to exchange food, a common practice, the couple living seaside at Ke'anae giving fish and the couple living upland giving garden produce.
>
> One day the woman from the shore gave her sister-in-law on the hillside nothing but a fishtail in exchange for bananas and sweet potatoes. The woman took the fishtail home in her calabash, saying nothing about the scanty trade.
>
> That night both she and her husband dreamed of a shark, and when they woke up in the morning they found a live shark swimming around in the calabash, where only a tail had been the night before.
>
> The excited couple freed the shark in an upland pool and made offerings to it. During a heavy rain, the shark was washed down to the ocean, where…it lives to this day in an underground cave near Ke'anae wharf (Lueras 1983:92).

Studies of the history of land use indicate that lands within the Ko‘olau Moku were intensively and continuously used for wetland taro cultivation or *lo‘i* agriculture from the pre-Contact era up until the present day (Group 70 International, Inc. et al. 1995; Handy and Handy 1997). In addition to extensive *lo‘i* terracing and associated temporary habitation features, Land Commission Award testimony also indicates that the cultivation of the *olona* plant and gathering of *olona* fibers were also important parts of the traditional economy in the Ko‘olau area.

With regard to political influence and the course of Hawaiian history, it has been noted that there may have been some rivalry within Ko‘olau Moku between the *ahupua‘a* of Ke‘anae and neighboring Wailuanui. This rivalry, however, would give way to larger political battles concerning the rule of Maui Island and the line of succession between the sons of Pi‘ilani (Kamakau 1992:22-29), and later, the consolidation of power and unification of the Hawaiian Islands under Kamehameha (Group 70 International, Inc. et al. 1995).

Chief Pi‘ilani united all of Maui under his rule during the 16th or 17th century. Pi‘ilani’s sons Lonopi‘ilani and Kiha-a-Pi‘ilani fought for control of Maui. Kiha-a-Pi‘ilani eventually took refuge at Hāna. While in Hāna, Kiha-a-Pi‘ilani took as his wife Koleamoku, who had been betrothed to Lonopi‘ilani, which again put the two brothers to warring. Kiha-a-Pi‘ilani and his wife Koleamoku fled to Hawai‘i Island to enlist the aid of Umi. Umi was married to Pi‘ikea, the daughter of Pi‘ilani (sister of Lonopi‘ilani and Kiha-a-Pi‘ilani), a marriage that had formerly brought peace between the islands of Hawai‘i and Maui. However, Umi sided with Kiha-a-Pi‘ilani and sent an invasion fleet to Hāna. In Hāna, at Ka‘uiki, Lonopi‘ilani's forces, under the command of Ho‘olaemakua, withstood the Hawai‘i forces for a while until a nighttime raid overwhelmed them. With this battle Kiha-a-Pi‘ilani gained control of Maui. Kiha-a-Pi‘ilani "is credited with finishing the paved road around the island (Ke Alaloa o Maui), which his father (Pi‘ilani) had begun ... and restoring Honua‘ula *heiau* just inland of Pu‘u Ka‘uiki" (Griffin 1987:9).

During the last half of the 18th century the battles between Maui and Hawai‘i were carried on by the high chiefs Kahekili of Maui and Kalani-‘opu‘u of Hawai‘i. Kalani-‘opu‘u was in control of the Hāna and Kīpahulu areas from ca. 1759 to 1765 when Kahekili won out. However, the Hawai‘i forces were able to regain control from ca. 1775 to 1783. In 1778, when Capt. James Cook’s ships returned from their North American explorations, they stopped off Hāna but didn’t land. Kalani-‘opu‘u and Kamehameha both visited Cook’s ships, indicating who controlled the Hāna area. With the death of Kalani-‘opu‘u in 1782, Kahekili regained control of Hāna, which he retained, though not without further battles with Hawai‘i Island forces (i.e. Kamehameha), until his death in 1794. With the death of Kahekili and the assistance of newly acquired foreign power (canons, muskets, men) Kamehameha gained control not only of Maui, but of all the Hawaiian Islands, except Kaua‘i, by 1795.

Figure 5. Portion of the Dodge 1885 map showing the location of Kolea Reservoir in relation to traditional land divisions.

3.1.2 Early Historic Period

Following western contact and unification of the islands under a single ruler, and as a result of the shift from traditional Hawaiian land tenure to one based on western principles of private ownership through the execution of the Māhele, the influx of foreign interests and the introduction of rice as a cash crop began to change the cultural demographic of Ko‘olau Moku. The Hawaiian communities became more concentrated rather than dispersed throughout the region following the mid-19th century Māhele. When opportunities for land purchases through Royal Patent Grants arose, Hawaiians from the Ke‘anae area began to acquire these grants primarily for *kula,* or pasture lands, as either a single owner or as a *hui* or co-op (Linnekin 1983:185, 1985:24-25). There were twenty-one Royal Patent Grants issued in the Ke‘anae region (769.35 acres) alone, all but one going to Hawaiians (Linnekin 1985:24-25). The primary thrust, it seems, for the formation of the *hui* ventures and acquisition of these *kula* lands was to regain access to upland resources. A corollary effect of the formation of these land *hui* and the acquisition of *kula* lands was a greater retention of acreage by Hawaiians from Ke‘anae, thus effectively preventing foreign interests from developing sugar plantations or cattle ranches along the *mauka* portions of the region (Linnekin 1983;181-185).

In the second half of the 19th century, the market for rice grew markedly with an increasing demand from Chinese laborers working on the sugar plantations in Hāna. With a pond field irrigation system already in place in Ke‘anae, the region was ripe for conversion from taro cultivation to rice. It was common practice for Chinese entrepreneurs to lease former *lo‘i kalo* lands from Hawaiian owners for rice cultivation (Group 70 International, Inc et al. 1995:28). Tax records for 1890 indicate that the rice lands in Ke‘anae and Wailuanui comprised approximately 67.84 acres out of a total of 163.322 acres in pond-field agriculture. Two years later, this number rose to 75 acres in Ke‘anae and Wailuanui while other lands on Maui (Honokowai, Waikapu, Wailuku, Waiehu, and Waihe‘e) registered a combined acreage of 175 (Group 70 International, Inc. 1995:28 and Linnekin 1985:30). The Chinese farming community flourished in Ke‘anae and with an increase in population came improvements to infrastructure needed to support more people as well as to facilitate accessibility to this once remote region of Maui. These improvements included the opening of the historic Hāna Belt Road and construction of necessary buildings associated with the rice plantations. Rice farming however would decline sharply following 1910 and by 1935 it had ceased entirely (Group 70 International, Inc. et al. 1995:36-37).

3.1.3 Land Commission Awards in the Immediate Area

Following the Great Māhele of 1848, two *kuleana* Land Commission Award (LCA) claims were awarded in the general vicinity of the Kolea Reservoir (see Table 1, Figure 6). The LCA information suggests that, into the mid-19th century, the area surrounding the reservoir maintained a limited population with an economy focused on wetland agriculture. In addition there were also claims for *olona* and *kīhīpai*.

Table 1. Land Commission Awards near Kolea Reservoir (Waihona ‘Aina Corporation 2000).

LCA #	Claimant	Apana	‘Ili	Land Use
03715-B	Kekuahani	n=3	Keopuka, Loiloa	Lo‘i and Olona

LCA #	Claimant	Apana	‘Ili	Land Use
03957-B	Keuoho, Luka and Kenhoa	n=5	Punaluu	Agriculture

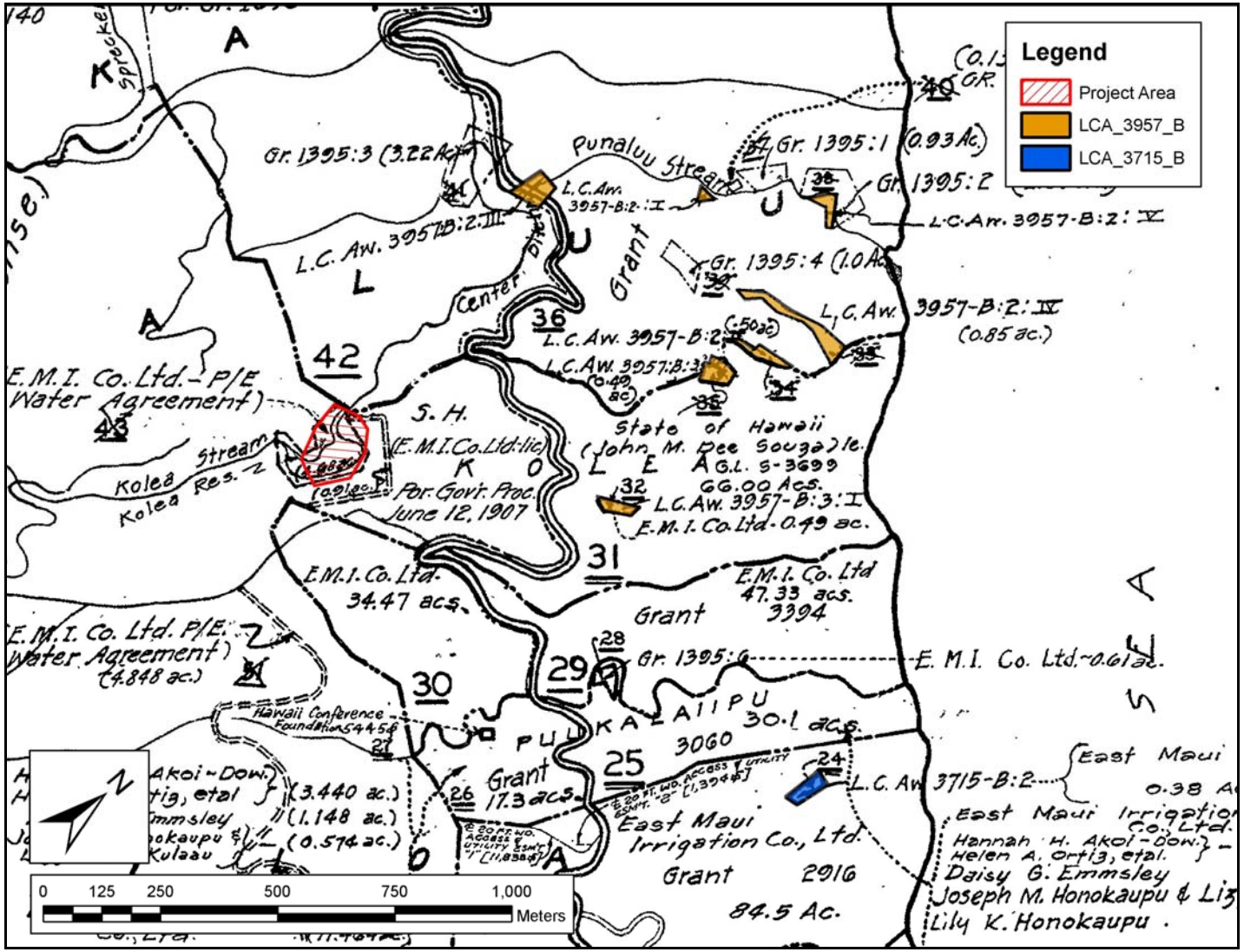


Figure 6 A portion of TMK (2) 1-1-001 showing LCA claims in Plat 001 in relation to the Kolea Reservoir.

3.1.4 1900s

Following the annexation of the Hawaiian Islands as a Territory of the United States in 1898, a county system of government was adopted. By 1905, Maui County had elected its first Board of Supervisors, hired its first road engineer, and established a system to appropriate money for road improvements (Maui News 1926). The “Belt Road” connecting Kahului with Hāna was given a high priority, with a general plan for its completion in place by 1910.

Prior to the construction of the Belt Road to Hāna, horse trails, developed when engineers constructed ditch systems between East Maui and the central Maui isthmus, were the only means of overland travel. Inter-island steamships made regular stops at the Ke‘anae Landing, but were considered expensive ($2.00 for deck passage). Travelers leaving Ha‘ikū on horseback for Ke‘anae descended and ascended 22 major valleys before arriving at Ke‘anae. Along the way, the traveler would have visited Native Hawaiian villages at Huelo, Kolia, Waiakamoi, Wahinepe‘e, Puahokamoa and Honomanū (Maui News 1926).

Writer George Bowser traveled to Ke‘anae on horseback in 1879, and described the village:

> My next halting place was the little hamlet of Keanae. There are here only few Kanaka huts and some patches of taro cultivation, but it is just the spot for the growth of the sugar cane, and has the benefit of a very good landing at which the steamer “Mokolii” calls about once a month. Mr. J.C. Garrett has a sugar plantation here, which was a delight to the eyes, as a contrast to the forest scenery I had been passing through. There are something like 2,000 acres here, all virgin land, capable of being turned account for the cultivation of the sugar cane.
>
> The native huts are generally constructed of a framework of bamboo, with something more substantial for uprights with rafters of bamboo for the roof. Over these a covering is laid of the native grass called pili, which will last for twenty years and will withstand the heaviest rains. Some huts, however, are covered with lauhala, which is the leaf of the puhala tree. The natives sometimes cook inside their huts. The sleeping place is on a raised platform about a foot and a half from the floor, and is covered with two or three layers of matting, also made of lauhala. I found these matting beds very comfortable to sleep upon and very suitable to the climate.
>
> Wailua is the name of the next place I arrived at, some two miles further on. Near the road from Keanae to here are several beautiful waterfalls. These, in the summertime, are beautified by perpetual rainbows. The Wailua Valley is about two miles square. There are here a church and a school house and a number of native houses, some of which are built of wood. For shooting, there is an abundance of wild turkeys and wild goats; plenty of fish of various sorts are always close at hand, oranges and wild bananas, mountain apples and guavas, all to be had for the picking.
>
> There is, in this part of the island, a species of taro which does not require irrigation. It is planted in rows the same way we plant potatoes, and it comes to

> maturity within the same time as the other species which needs to constantly be covered with water viz.: in about twelve months from the time of planting (Maui News 1926:Section Seven).

By 1922, the Belt Road had been completed between Kuiaha and Kakipi Gulch. In 1923, the County Board of Supervisors requested more prison labor for roadwork between Kailua and Ke‘anae. While road work continued toward Ke‘anae, survey work commenced between Ke‘anae and Kopili‘ula. In June 1925, the grand opening of the Kailua-to-Ke‘anae portion of the Belt Road was celebrated by a procession of automobiles to Ke‘anae. Territorial Governor Wallace Farrington dedicated the opening of the road with County Board of Supervisors Chairman Samuel Kalama and others (Figure 7) (Maui News 1926).

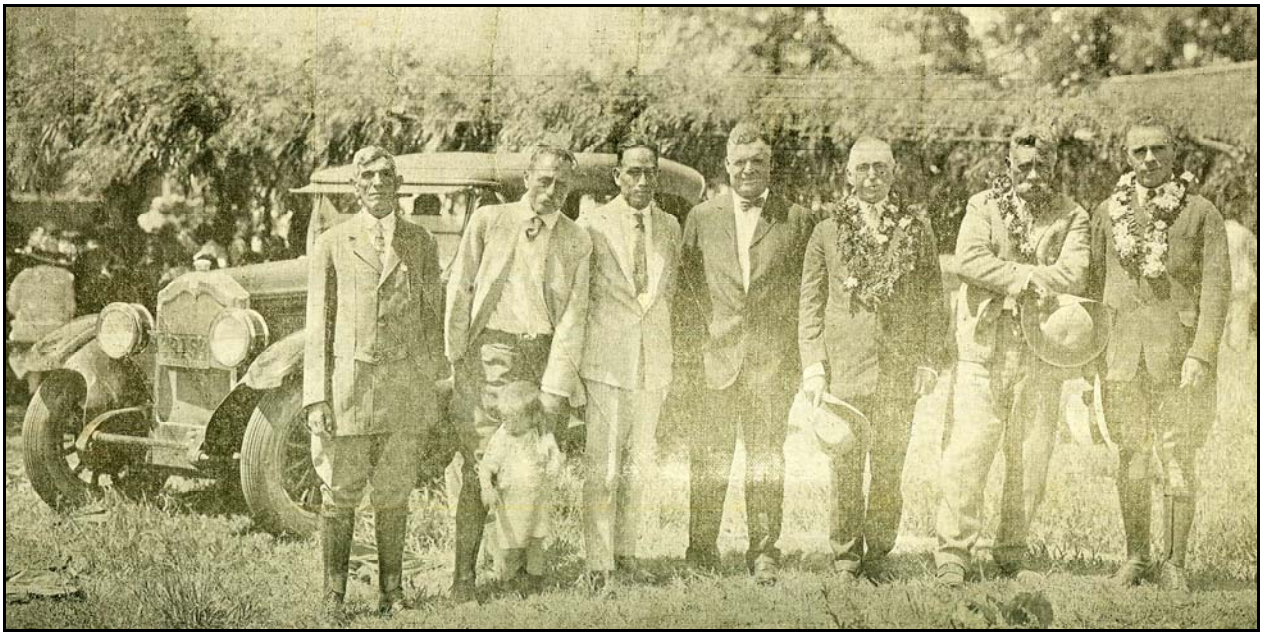


Figure 7. A group of Maui County Supervisors pose with Governor Farrington in Ke‘anae. Left to right: R.A. Drummond, W.F. Kaae, County Engineer P. Low, Sheriff C. Crowell, Governor W. Farrington, Chairman S. Kalama and D.T. Fleming.

On April 1, 1946 a *tsunami* generated by an earthquake in the Aleutian Islands off the coast of Alaska, struck the Ke‘anae Peninsula. The height of the *tsunami* run-up over two separate spots at Wailua was measured at 4.8 meters (15.7 ft.) and at 5.1 meters (16.7 ft.) (World Data Center 1977). The Lanakila Ihiihi O Iehowa Ona Kaua Congregational Church, constructed of coral and stone on the Ke‘anae Peninsula between 1857 and 1863, was the only structure left standing when the *tsunami* receded (Bartholomew and Bailey 1994). Today, Ke‘anae and Wailua are a fretwork of working taro fields, small residential areas, and parks. Residents live on higher ground in Wailua, and send their children to school in Hāna, some 14 miles away.

3.2 Previous Archaeological Research

This section provides a brief overview of the research and findings of previous archaeological investigations in the general area of the current project (Figure 8 and Figure 9). Investigations including the current project area are discussed next followed by a summary of those conducted nearby (Table 2).

While there is a relatively high density of historic properties recorded within Ko‘olau Moku (Figure 9 and Table 3), few archaeological investigations have been conducted in this area. Formal archaeological research began on Maui early in the twentieth century when Thomas Thrum began recording the *heiau* of Maui in the Hawaiian Annual from 1909 through 1918. By the conclusion of his study, Thrum had located 121 *heiau* on Maui (Thrum 1909-1918). At the same time, J.F.G. Stokes documented many structures and heiau in Maui (Stokes 1918). However, the first attempt at a systematic island –wide survey was undertaken by Winslow Metcalf Walker from 1928 to 1929. The survey was commissioned by the Bishop Museum and focused on large sites and *heiau* around the island.

Table 2. Previous archaeological studies in the general vicinity of Ko‘lea dam.

Author(s)/ Date	Location	Nature of Work	Findings
Stokes 1918	Island-wide	Search for heiau structures	Identified seven heiau in Ko‘olau Moku.
Walker 1931	Island-wide	Island-wide archaeological survey with a primary focus on monumental and/or ceremonial archaeology	Identified 20 heiau in Ko‘olau Moku, noted ten destroyed.
Palama 1981	Wailua Homestead	Archaeological field inspection	No findings
Group 70 et al. 1995	Keanae/Wailuanui	Archaeological inventory survey in conjunction with a cultural landscape study of the Wailua Nui and Ke‘anae irrigated taro complex	Identified three distinct taro field systems and defined the overlying cultural landscape of the region.
Haun and Henry 2003	Wailuanui Ahupua‘a	Archaeological inventory survey	Pre-contact temporary habitation site and trail

Stephen Palama (1981) conducted an archaeological field inspection of approximately 3.16 acres within Wailua Homesteads. This cursory field inspection did not locate any new historic properties.

Kukui o Puni Heiau (SIHP 50-50-07-096) was further described during a more recent archaeological cultural landscape investigation of three separate taro field systems found at Wailuanui and Ke‘anae (Group 70 International, Inc. et al. 1995).

Haun and Henry (2003) conducted an archaeological inventory survey of approximately 4 acres at Pauwalu in Wailuanui Ahupua‘a. The inventory survey resulted in the identification of one historic property, SIHP 50-50-07-5237, consisting of an overhang (Feature A) and trail (Feature B). The overhang was interpreted as a pre-contact temporary habitation shelter that was occupied between AD 1420-1650 and the trail as a transportation route.

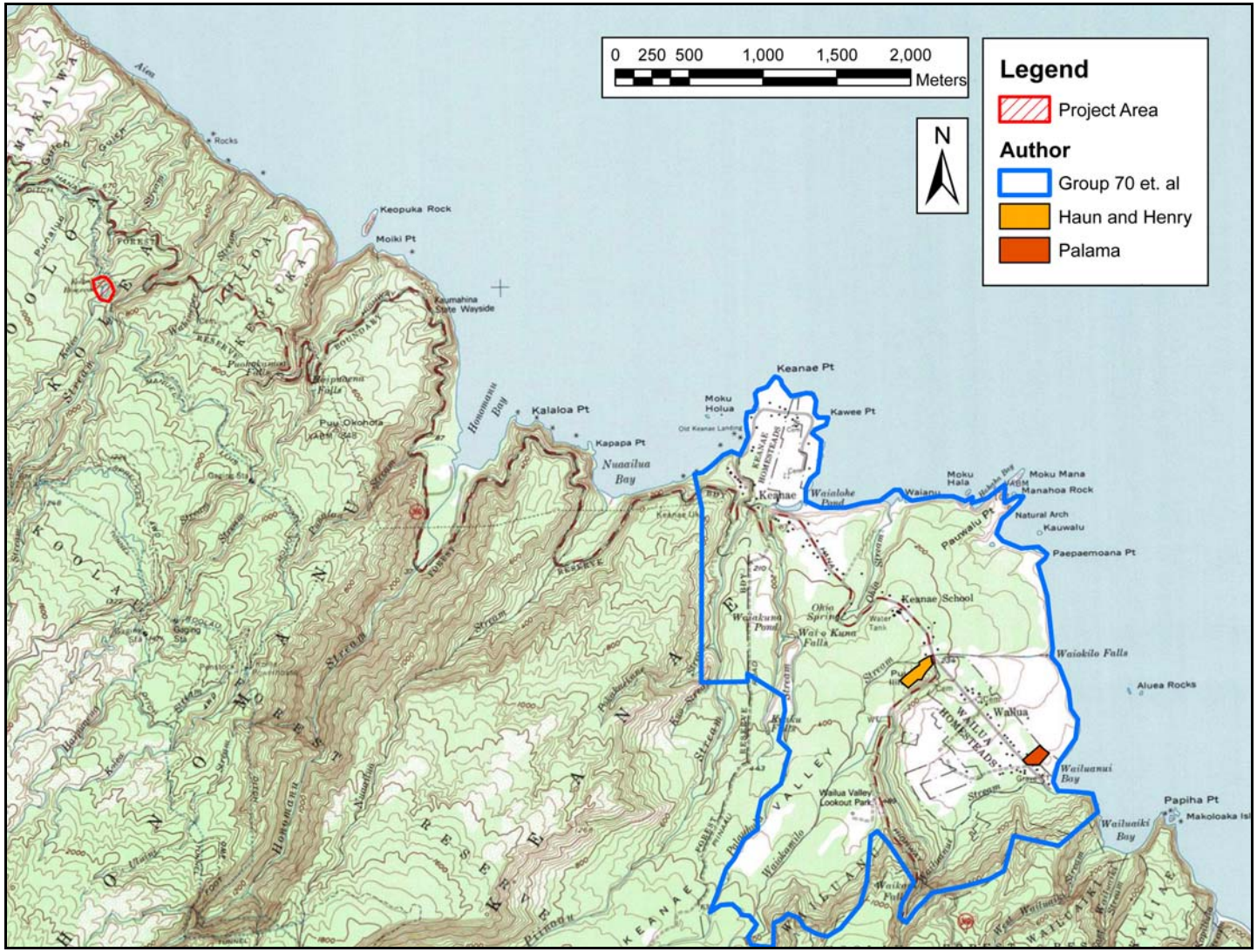


Figure 8. A portion of the 1983 Keanae 7.5-minute USGS topographic quadrangle showing previous archaeological studies in the vicinity of Kolea Reservoir

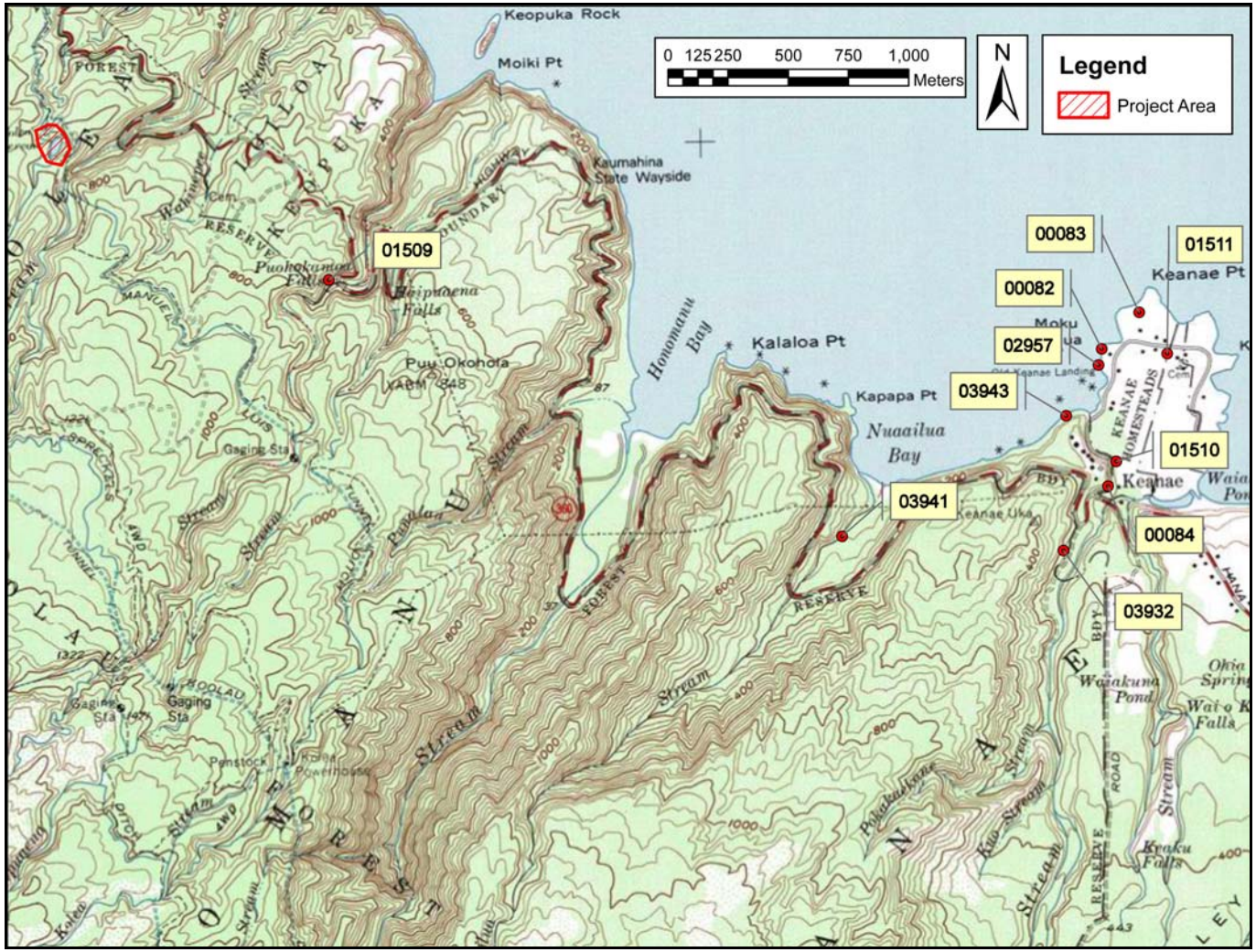


Figure 9. A portion of the 1983 Keanae 7.5-minute USGS topographic quadrangle showing the locations (Department of Land and Natural Resources, State Historic Preservation Division [DLNR/SHPD] 2004) of previously documented historic properties in relation to the Kolea Reservoir.

Table 3. Brief descriptions (DLNR/SHPD 2004; Haun and Henry 2003) of previously documented historic properties in relation to the Kolea Reservoir

SIHP# 50-50-07-	Name	Ahupua‘a	Comments
00082	Kukuiolono Heiau	Ke‘anae	Destroyed
00083	Laloa Heiau	Ke‘anae	Destroyed
00084	Pakanaloa Heiau	Ke‘anae	Reported as a war heiau to Kanehikili; Destroyed
01509	Puohokamoa Bridge	Honomanu	Constructed in 1912, placed on Hawaii Register of Historic Places in 1974.
01510	Lin Hing Society Building	Ke‘anae	Placed on Hawaii Register in 1974; disassembled
01511	Lanakila Church	Ke‘anae	Established 1856
02957	Ke‘anae Landing	Ke‘anae	Historic boat/steamship landing
03932	Ke‘anae Arboretum Taro Complex	Ke‘anae	Comprised of 14 lo‘i and a main ‘auwai
03941	Nua`ailua Taro Complex	Ke‘anae	Site -03941 appeared to be an old, unmodified complex of lo`i sitting above and below Hana Highway. No size estimate given by CSH (1994 survey).
03943	Ke‘anae Quarry	Ke‘anae	Consists of historic quarry with rock crusher still in place. A stone platform within the quarry boundaries is said to be the grave of a worker killed in a quarry accident.

3.3 Background Summary and Predictive Model

The initial occupation of this portion of Maui first occurred along the coastal region of Hāna about AD 1200 (Haun et al. 2004). The accepted pre-contact settlement pattern for the region of Ke‘anae/Wailuanui centers on the series of occupational episodes that utilized the Palauhulu Stream for taro (*Colocasia esculenta*) cultivation. A 1995 cultural landscape study by Group 70 International, Inc., Davianna McGregor, and Cultural Surveys Hawai‘i Inc. recorded the intensive use of the Ke‘anae and Wailuanui region for taro, identified three separate field systems, and noted the processes by which community cooperation led to the field system operation.

Evidence of a cohesive population is perhaps best described by the first Europeans to visit Ke‘anae. From the journal of William Richards (1829), a Protestant missionary, comes information that the region between Honomanu and Wailua was densely populated:

> We went on board the canoe, and rowed a few miles, avoiding some difficult *paries* [steep cliffs]. After landing, we walked a few miles further, to Wailua, where we

> put up for the Sabbath. Very early the morning [of the Sabbath], the horns, summoning the people to the house of God, were heard in every direction; and we soon perceived that the call had not been heard with indifference. At the early hour, the house was thronged with attentive worshippers. [The next day] we examined the schools, which were large. About 10 o'clock, A.M., the princess [Nahienaena] arrived, and addressed the people; after which, we proceeded on our way [to Hāna] (Richards 1829:249).

According to the Group 70 International, Inc. et al. (1995) cultural landscape study, over 490 LCAs claimed taro patches of various sizes at Ke‘anae and Wailuanui during the mid-19th century Great Māhele. Several LCAs included claims for pools and fishponds. In addition, evidence of densely-grouped regional *heiau* and smaller shrines was the subject of specialized studies dating from the turn of the 20th century (Thrum 1907) to more recent work by Maria E. Orr (1990).

Background research into the land use patterns of the surrounding vicinity indicated that the area was intensively used for pre-contact agricultural pursuits, permanent and temporary habitation and traditional ceremony, as well as historic-era agriculture represented by both taro and rice cultivation. As such, it was deemed possible that historically significant subsurface cultural deposits in the form of pond-field deposits representing both traditional and historic agriculture, as well as, midden and other cultural material concentrations representing both traditional and historic habitation may occur within the area.

Section 4 Results of Fieldwork

During the current investigation one historic property was recorded, SIHP # 50-50-13-6682, the Kolea Reservoir. According to the Department of Land and Natural Resources (DLNR) Dam Safety Program, the Reservoir, State Dam ID MA-0097, National ID HI00097, was constructed in 1901 (Figure 10). Six associated features were observed during the inventory survey, five within the project area and one just outside. A detailed description of the historic property is presented in this following section.

4.1 Historic Property Description

SITE NUMBER SIHP # 50-50-13-6682

FUNCTION: Water Control

SITE TYPE: Plantation Reservoir

TOTAL FEATURES: 6

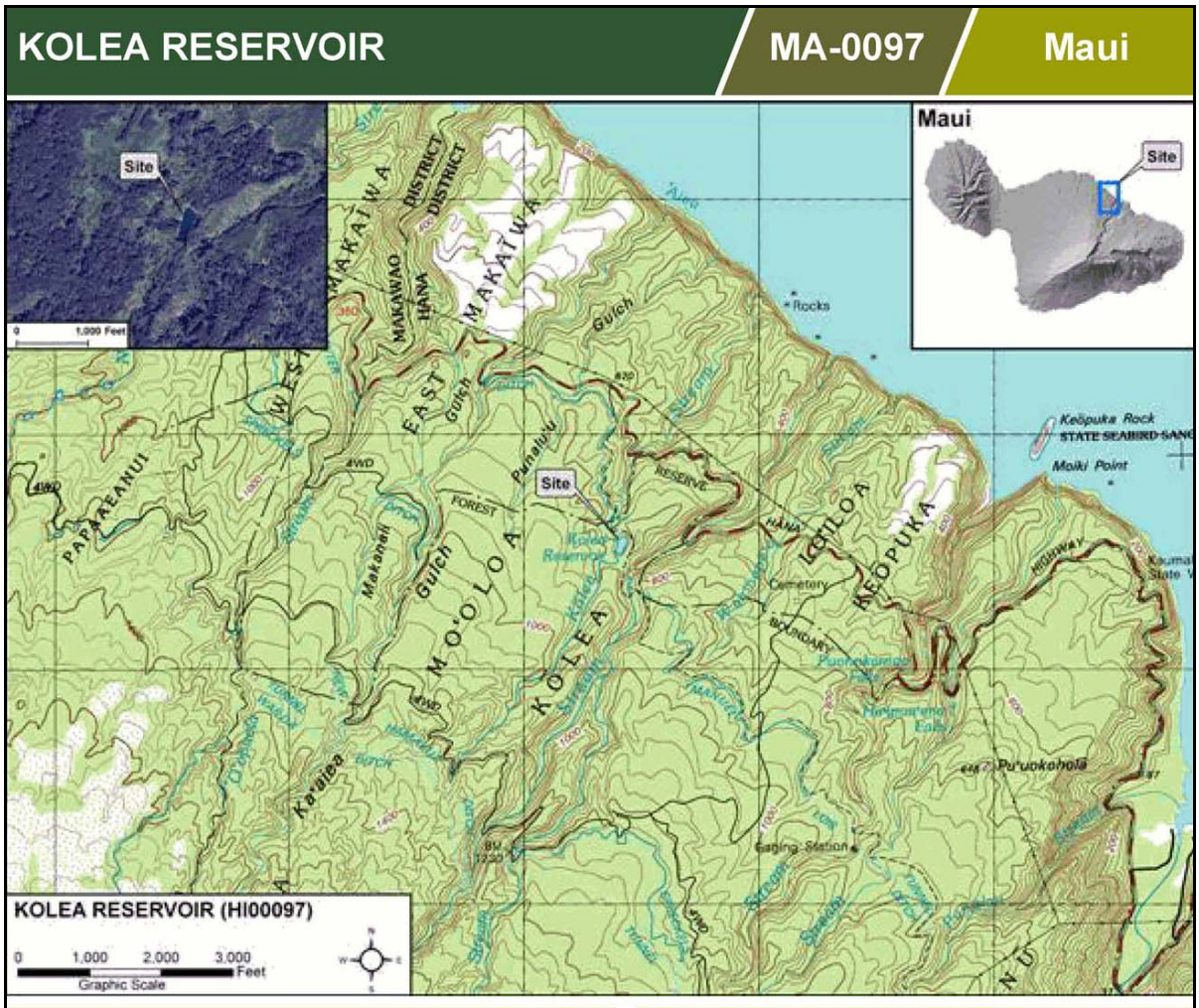
DIMENSIONS: 120m N/S 120m E/W

CONDITION: Good

AGE: Plantation era

DESCRIPTION: SIHP # 50-50-13-6682 (Figure 11) is a plantation-era reservoir/water control system constructed in 1901 consisting of six associated features, five within the project area, and one just outside (Figure 12 and Figure 13). These features include: the spillway (Feature A), reservoir (Feature B), a catwalk (Feature C), the dam (Feature D), and the reservoir outlet (Feature E) within the project area. Feature F, a water diversion structure, is located immediately north of the project area.

There are no known construction or design plans for the reservoir (Mark K. Vaught, Operations Manager, East Maui Irrigation Co, Ltd., Personal Communication 2010). However, Stephen Cabral, a former EMI Manager, was able to provide some insight into the construction of the reservoir. Mr. Cabral notes that all of the stone work at the face of the dam, obscured today by bamboo, was delivered to the site by mule and ox and dumped in place from the stream level up. All cutting was by hand and explosives (Stephen Cabral Personal Communication March 08, 2010).



1. General Information	
a. State Dam ID	MA-0097
b. National ID	HI00097
c. Dam Name	KOLEA RESERVOIR
d. Other Name(s)	
e. Longitude / Latitude	-156.1898 / 20.8724
f. County / Island	Maui / Maui
g. Type of Dam	Earthen
h. Purpose	Irrigation
i. Completed / Last Modified	1901 /
j. Nearest City / Town	
k. Water Body Type	State Regulated Dam
l. Dam Height	45 ft
m. Dam Length	300 ft
n. Drainage Area	/
q. Primary Spillway Type	Channel
r. Maximum Storage	34 ac-ft / 11 MG

2. Owner Information	
a. Name of Owner	East Maui Irrigation Company; State of Hawaii, Dept of Land & Natural Resources
b. TMK(s):	(2) 1-1-001: 050

3. Hazard Potential Classification	
a. Hazard Rating1	Proposed Low
b. Date of Assessment	

4. Other Information	
a. Last Inspection	03/07/2008
b. Emergency Action Plan Date	03/22/2006

Figure 10. Dam Information Sheet provided by the Department of Land and Natural Resources-Engineering Division (DLNR 2009)

Figure 11. A portion of the USGS 7.5’ topographic map, Keanae Quadrangle (1983) showing the site boundary in relation to the project area.

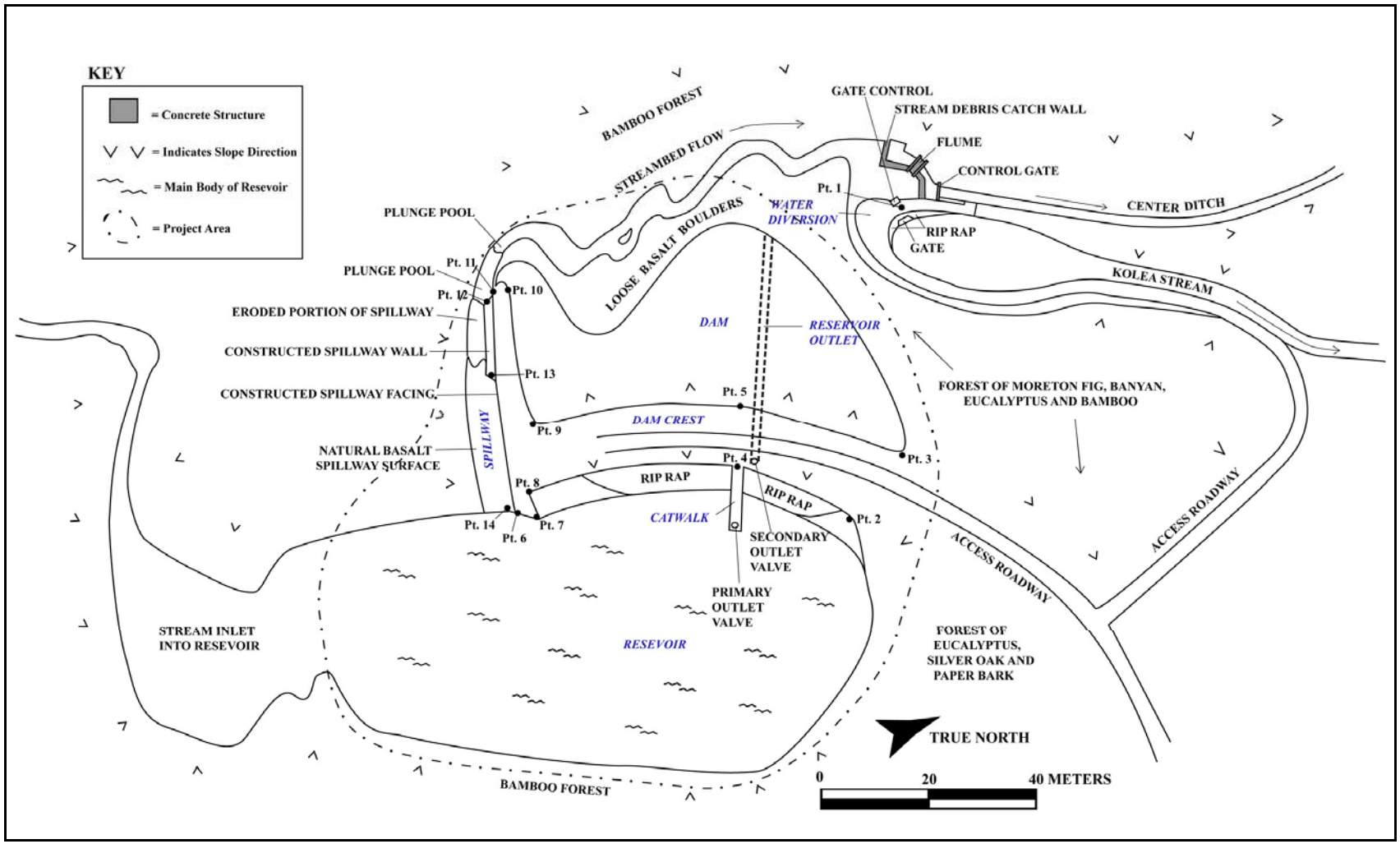


Figure 12. Field drawing of site CSH 1, features shown in blue.

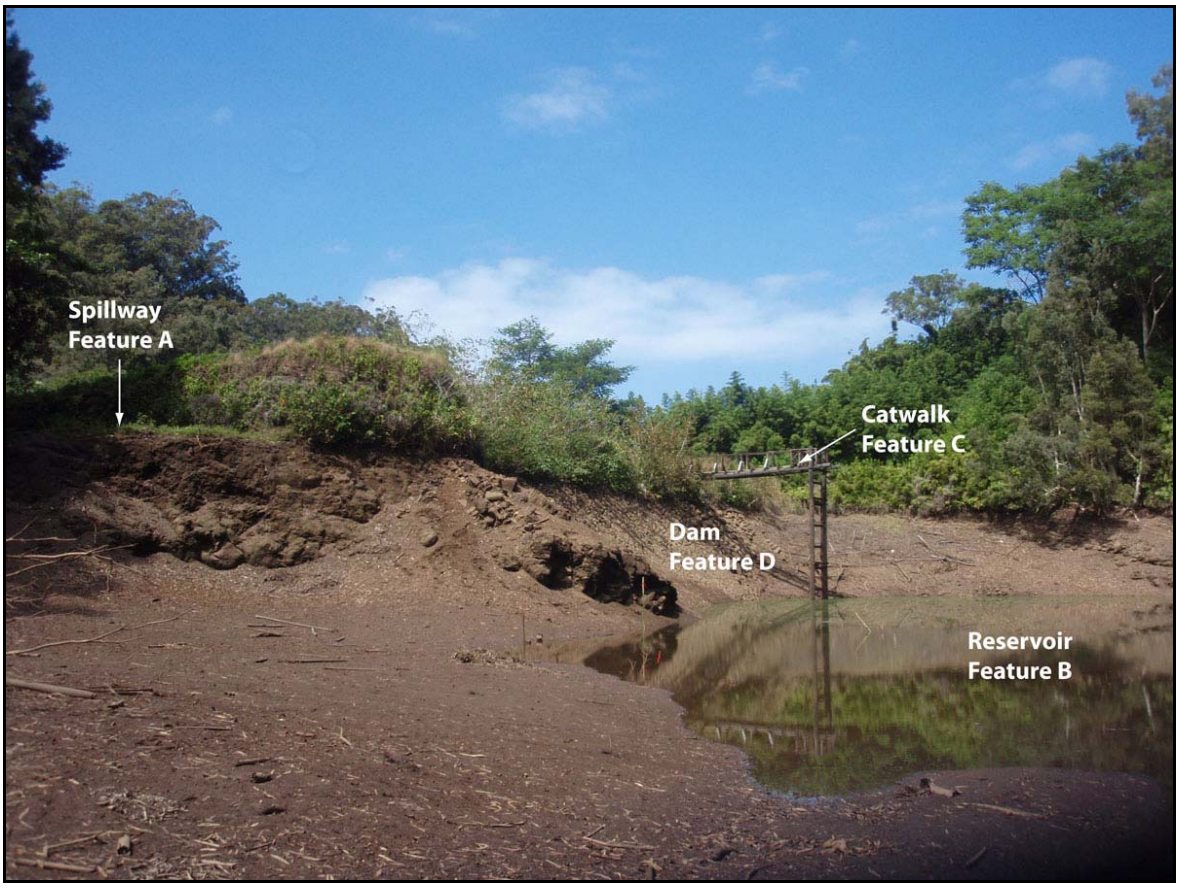


Figure 13.A view of the reservoir showing associated features within the project area, Feature E is underwater and not visible.

Feature A, the spillway, is located upstream of the Kolea Dam and west of the reservoir. It was designed to allow excess storm runoff to bypass the resevoir. The spillway is essentially a notch cut against a mountainside resulting in a 16m tall wall to the south, and a 3 m tall constructed stacked basalt boulder wall along its north face. The spillway is 10m wide and 4m above the floor of the reservoir ending in two deep natural plunge pools, each 4m deep. Water diverted by the spillway is returned to the natural streambed via the two plunge pools. The entire floor of feature A is exposed bedrock.

Figure 14. Feature A, spillway, view to west.

Feature B, the Kolea Stream reservoir was dredged and constructed in 1901. By the use of a dam constructed of the dredged earth and large basalt boulders, the reservoir holds stream water. A control allows the stored water to be released at a regulated rate. All sides of the reservoir are earthen.

Feature C is a wood frame catwalk which begins at the crest of the Kolea Dam. It is built straight out into the reservoir on a pair of wood poles over 15m tall (Figure 15). Another pair of poles over 10m long connect the structure to the bank of the crest of the dam. A row of 14 wood 4 x 4 beams provides a base for metal panels that span the entire length of the catwalk. A railing that runs the length of the catwalk is of wood and is supported by 8 2x 4 beams on each side (16 in all). At the end of the catwalk, some 60 feet above the Kolea Reservoir, is a control wheel for the reservoir. At scale built onto one of the support poles measures the level of the reservoir to a maximum depth of 43 feet. The reservoir catwalk was an improvement constructed sometime in the 1970’s; prior to that, the reservoir control was built into the side of the reservoir dam crest (Stephen Cabral Personal Communication March 08, 2010).

Figure 15 Feature B, the catwalk, and Feature C, the reservoir, view to south.

The Kolea Dam was constructed to store stream water from the Kolea Stream in a reservoir located southeast of and behind the crest of the dam. The date of construction is between 1900 and 1901, according to DLNR records. While constructing the dam, earth was packed behind the dam face. Rock from blasting at the spillway was utilized to construct the rock face cut just south of the spillway. All rip-rap surfaces at the reservoir and at the lower water diversion ditch were hand-built (Stephen Cabral Personal, Communication March 08, 2010). The Crest of the dam measures 70m long of the 100m and is 10m wide.

Figure 16. Feature D, the dam view to south.

Feature E, the Kolea Dam reservoir outlet is a controlled gate built into the reservoir that allows the reservoir water to exit and travel to the center ditch diversion control (Feature F). The reservoir outlet consists of a primary control wheel on the catwalk and a secondary control wheel on the crest of the dam which operate a gate releasing stored water at a controlled rate. The gate is supported on the interior of the reservoir by a rip-rap wall of set basalt boulders that appear faced, but in fact are not.

Figure 17. The secondary outlet valve control for Feature E, view to the north.

Feature F, the concrete stream diversion controls, are located to the northwest and downstream of the Kolea Dam, just outside of the project area. The diversion controls consist of a poured concrete wall which separates stream debris from the water, a basalt boulder dam which diverts stream overflow into the streambed of Kolea Stream (if required), a flume which delivers additional off-site stream water to the diversion control, in addition to a concrete control gate and concrete-lined canal which constitutes the beginning of the "center ditch". According to Mr Cabral, concrete improvements at the Center Ditch diversion continued through the 1970’s, but he had not heard about any concrete work done there since (Stephen Cabral Personal, Communication March 08, 2010). A dirt access road ends atop the basalt boulder dam. A control wheel allows the overflow to travel through a gate to the Kolea stream.

Figure 18. Feature F, the water diversion controls, view north.

Section 5 Summary and Interpretation

One historic property was recorded, SIHP # 50-50-03-6683, the Kolea Reservoir. According to the Department of Land and Natural Resources (DLNR) Dam Safety Program, the Reservoir, State Dam ID MA-0097, National ID HI00097, was constructed in 1901. Six associated features were observed during the inventory survey, five within the project area and one just outside. These include the spillway (Feature A), reservoir (Feature B), a catwalk (Feature C), the dam (Feature D), and the reservoir outlet (Feature E) within the project area. Feature F, a water diversion structure is located immediately north of the project area

The fieldwork component of the archaeological inventory survey was accomplished on February 23 and 24, 2010 by CSH archaeologists, Todd McCurdy, M.A. and Robert Hill, B.A., under the general supervision of Hallett H. Hammatt, Ph.D. The fieldwork required approximately 20 person-hours to complete. The inventory survey documentation included site recordation of the Kolea Reservoir and associated features.

For well over 100 years the Kolea Reservoir has been a reminder of the water intensive agriculture and associated development on the "Valley Isle" during the plantation period. Of the 54 reservoirs recorded in Maui, there are only two others that pre-date the Kolea Reservoir, Kaupakalua and Kapalaalaea Reservoirs, both constructed in 1885 (Department of Natural Resources-Engineering Division 2009). The crude style and hand-built construction of the Kolea Reservoir represent the ingenuity the plantation-era engineers and the determination of the workers who built it. The more dependable water supply from the reservoir increased production of the fields and increased the amount of arable land which necessitated additional labor, thus affecting the broad economic and social patterns of the island.

Section 6 Significance Assessments

Significance assessments have been made in accordance with the State Department of Land and Natural Resources (DLNR) Chapter 13-284, Hawai‘i Administrative Rules (HAR), entitled “Rules Governing Procedures for Historic Preservation Review to Comment on Section 6E-42, Hawai‘i Revised Statutes (HRS), Projects”. Chapter 13-284-6, entitled “Evaluation of Significance”, states:

a. Once a historic property is identified, then an assessment of significance shall occur. The agency shall make this initial assessment, or delegate this assessment, in writing, to the SHPD. This information shall be submitted concurrently with the survey report, if historic properties are found in the survey.

b. To be significant, a historic property shall possess integrity of location, design, setting, materials, workmanship, feeling, and association and shall meet one or more of the following criteria:

   A. *Sites that are associated with events that have made a significant contribution to broad patterns of our history; or*

   B. *Sites that are associated with the lives of persons significant in our past; or*

   C. *Sites that embody the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master, or that possesses high artistic values, or that represents a significant or distinguishable entity, whose components may lack individual distinction; or*

   D. *Sites which have yielded, or may be likely to yield, information important in prehistory or history; or*

   E. *Sites which have an important value to the native Hawaiian people or to another ethnic group of the State due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events, or oral accounts- these associations being important to the groups’ history and cultural identity.*

6.1 SIHP 50-50-13-6683

Table 4. Summary of Significance Assessments.

SIHP 50-50-13-	Site Type	Function	Age	Significance Criteria	Recommendations
6683	Plantation Reservoir	Water Diversion	Plantation era	A,C,D	A minimum of Architectural Inventory Survey Report Documentation

6.1.1 Criterion of Significance A

SIHP 50-50-13-6683, the Kolea Reservoir, is identified as significant under Criterion A as being associated with events that have made a significant contribution to broad patterns of our history. The reservoir is associated with a period of major change on Maui. Built in 1901, it was the first reservoir constructed on Maui after the annexation of Hawai‘i by the United States in 1898 according to the DLNR-Engineering Division (2009). The relaxation of tariffs and escalating demand for sugar thereafter made it a more profitable industry. Of the 54 existing reservoirs, 29 were built by 1918 and only two were constructed prior to the annexation, both in 1885 (DLNR-Engineering Division 2009). The increased water supply from the reservoirs improved the crop yield and more importantly increased the amount of arable land, therefore leading to additional labor requirements. This in turn encouraged an influx of immigrant contract laborers thus affecting the broad economic and social patterns of the island.

6.1.2 Criterion of Significance C

The method of construction utilized at SIHP-6683 displays a distinctive style consistent with the early plantation period on Maui. Its crude style and hand-built construction represent the ingenuity of the plantation-era engineers and the determination of the workers who built it. In addition it serves as a good example of early water diversion methods associated with the sugar industry. For these reasons SIHP-6683 is considered significant under Criterion C as it embodies the distinct characteristics of a method of construction.

6.1.3 Criterion of Significance D

This portion of plantation infrastructure has yielded information important to the understanding of water diversion techniques and structures employed during the early plantation period on Maui. For this reason, SIHP -6683 is considered significant under Criterion D.

Section 7 Project Effect and Mitigation Recommendations

Since there are no known construction or design plans for this reservoir (Mark K. Vaught Operations Manager, East Maui Irrigation Co, Ltd. Personal Communication 2010) and based on the above significance evaluations of SIHP 50-50-13-6683, Cultural Surveys Hawai‘i recommends a minimum of an Architectural Inventory Survey of this historic property the level of recordation to be determined in consultation with SHPD Historic Architecture Branch.

7.1 Disposition of Materials

All of the data gathered and generated during the course of documenting SIHP 50-50-13-6683 are currently being curated and housed at the Maui Office of Cultural Surveys Hawai‘i, Inc. (1993 Main Street, Wailuku, HI 96793), with copies on file at the main office of Cultural Surveys Hawai‘i, Inc. (41-1537 Kalanianaole Hwy # 200, Waimanalo, HI 96795-1185).

Section 8 References Cited

Bartholomew, Gail and Bren Bailey
1994 *Maui Remembers, A Local History*, Mutual Publishing, Honolulu

Beckwith, Martha
1970 *Hawaiian Mythology*. University of Hawaii Press, Honolulu,HI.

Department of Land and Natural Resources-Engineering Division
2009 Department of Land and Natural Resources Electric document, http://www.hidlnr.org/eng/dam/Maui.aspx, accessed March 4, 2010.

Department of Land and Natural Resources, State Historic Preservation Division
2004 *Geographic Information System (GIS) Archaeological Site Data for Maui (Version 2004.02)*. Electronic Database and GIS coverages. Universal Transverse Mercator (UTM) Projection, Zone 4, Old Hawaiian Datum (Clarke 1886 Ellipsoid). DLNR/SHPD, Honolulu.

Dodge, F.S.
1885 Maui, Hawaiian islands/primary triangulation by W.D. Alexander and S.E. Bishop; topography and boundaries by W.D. Alexander, C.J. Lyons, M.D. Monsarratt [map]. Scale = 1:90,000. Hawaiian Government Survey. On file at the Library of Congress Geography and Map Division, Washington D.C. Digital ID g4382m ha000012 http://hdl.loc.gov/loc.gmd/g4382.ha000012 (last accessed October 2007).

Fornander, Abraham
1999 [1916-16] *Hawaiian Antiquities and Folklore*. Vols. IV and V. Bishop Museum Press, Honolulu.

Foote, Donald E., E.L. Hill, S. Nakamura, and F. Stephens
1972 Soil Survey of the Islands of Kaua‘i, Oahu, Maui, Molokai and Lanai, State of Hawaii, U.S. Dept. of Agriculture. U.S. Government Printing Office, Washington, D.C.

Giambelluca, Thomas W., Michael A. Nullet, and Thomas A. Schroeder
1986 *Rainfall Atlas of Hawai‘i*. Department of Land and Natural Resources, Honolulu.

Griffin, Agnes
1987 *Report on a Field Inspection of Hāna Ranch Inc. Construction Site, Wananalua, Hāna, Island of Maui*, DLNR, HI.

Group 70 International, Inc., Davianna McGregor, and Cultural Surveys Hawai‘i Inc.
1995 *Kalo Kanu O Ka‘āina*: *A Cultural Landscape Study of Ke‘anae and Wailuanui, Island of Maui*. Prepared for The County of Maui Planning Department and The Maui County Cultural Resources Commission.

Handy, E.S. Craighill and Elizabeth Handy
1997 *Native Planters in Old Hawaii*, B.P. Bishop Museum Press, Honolulu.

Haun, Alan E. and Dave Henry
2003 Archaeological Inventory Survey TMK: 1-1-008:015, 023, Land of Pauwalu, Hana District, Island of Maui. Haun & Associates. Keaau, HI.

Haun, Alan, Dave Henry, and Maria E. Orr
2004 Archaeological Inventory Survey Wai‘ānapanapa State Park, Lands of Honokalani, Wākiu, and Kawaipapa, Hāna District, Island of Maui, Haun and Associates, Kea‘au HI.

Kamakau, Samuel M.
1992 *Ruling Chiefs of Hawaii*, the Kamehameha School Press, Honolulu.

Linnekin, Jocelyn
1983 The *Hui* Lands of Keanae: Hawaiian Land Tenure and the Great Mahele. *Journal of the Polynesian Society* 92:169-188.

1985 *Children of the Land.* Rutgers University Press. New Brunswick, NJ.

Lueras, Leonard
1983 *On the Hana Coast*. Honolulu: Emphasis International Ltd.

Maui News
1926 Industrial Edition, Saturday, December 4, 1926, Maui Publishing Company, Wailuku, Maui, HI.

Orr, Maria E.
1990 A Preliminary Report on the Heiau of Hana and their Significance, Past and Present, Department of Anthropology, University of Hawai‘i, Honolulu.

Palama, Stephen
1981 Archaeological Field Inspection, Wailua, Hana, Maui. Makawao, HI.

Pratt, Linda W. and Samuel M. Gon III
1998 Terrestrial Ecosystems, section, appearing in *Atlas of Hawai‘i*, edited by Sonia p. and James O. Juvik, University of Hawai‘i Press, Honolulu.

Pukui, Mary K., Samuel H. Elbert and Esther Mookini
1974 *Place Names of Hawaii*, University of Hawai‘i Press, Honolulu, HI.

Richards, Reverend William
1829 Journal of William Richards, as printed in *The Missionary Herald*, For the Year 1829, Volume 25, American Board of Commissioners for Foreign Missions, Crocker & Brewster, Boston.

Sterling, Elspeth P.
1998 *Sites of Maui*, Bishop Museum Press, Honolulu, HI.

Stokes, J. F. G.
1918 Field notes, MS SC Group 2 Box 3; *Report on the Heiau of Maui*, 1918, MS SC Stokes Group 3, Box I; *Maui Sites Notes*, Anthropology Department Records, Group 7 Box 10. Bishop Museum Archives, Honolulu, HI.

Thrum, Thomas
1907 Heiaus and Heiau Sites Throughout the Hawaiian Islands, *Thrum's Hawaiian Almanac and Annual* (also issues for the years 1909, 1917 and 1921), Honolulu.

U.S. Department of Agriculture, Natural Resources Conservation Service

2001 *Soil Survey Geographic (SSURGO) database for Island of Maui, Hawaii (hi980).* U.S. Department of Agriculture, Natural Resources Conservation Service. Fort Worth, Texas. <http://www.ncgc.nrcs.usda.gov/products/datasets/ssurgo/> (last accessed October 2007).

Waihona ‘Aina

2000 Mahele Database. Online database, http://www.waihona.com/, last accessed August 2006.

Walker, Winslow

1931 Archaeology of Maui, Manuscript, Anthropology Department, Bernice Pauahi Bishop Museum, Honolulu.

World Data Center for Solid Earth Geophysics

1977 *Catalog of Tsunamis in Hawaii*, National Academy of Sciences, 2101 Constitution Avenue N.W., Washington, D.C.

Appendix A Land Commission Awards (Waihona ‘Aina Corporation 2000)

A.1 03715B Kekuahani

Claim Number:	**03715B**		
Claimant:	**Kekuahani**		
Other claimant:			
Other name:			
Island:	**Maui**		
District:	**Koolau**		
Ahupuaa:	**Haiku**		
Ili:	**Keopuka, Loiloa**		
Apana:	**3**	Awarded:	**1**
Loi:		FR:	
Plus:		NR:	
Mala Taro:		FT:	**39v15**
Kula:		NT:	
House lot:		RP:	**7518**
Kihapai/Pakanu:		Number of Royal Patents:	**1**
Salt lands:		Koele/Poalima:	**No**
Wauke:		Loko:	**No**
Olona:		Lokoia:	**No**
Noni:		Fishing Rights:	**No**
Hala:		Sea/Shore/Dunes:	**No**
Sweet Potatoes:		Auwai/Ditch:	**No**
Irish Potatoes:		Other Edifice:	**No**
Bananas:		Spring/Well:	**No**
Breadfruit:		Pigpen:	**No**
Coconut:		Road/Path:	**Yes**
Coffee:		Burial/Graveyard:	**No**
Oranges:		Wall/Fence:	**No**
Bitter Melon/Gourd:		Stream/Muliwai/River:	**No**
Sugar Cane:		Pali:	**Yes**
Tobacco:		Disease:	**No**

Koa/Kou Trees:		Claimant Died:	**No**
Other Plants:		Other Trees:	
Other Mammals:	**No**	Miscellaneous:	**government road**

No. 5250D, Kekuahani
F.T. 125v8

The claimant, sworn, that he had written the claim and have sent it to the Land Commission.

Inihia, sworn, The claimants land are of two pieces.

No. 1 is kalo and kula land in the Ahupuaa of Keopuka & Loiloa.
No. 2 is kula land in the Ahlupuaa of Keopuka & Loiloa.

The claimant received these lands from Ikoa, Konohiki for Loiloa in the year 1839. His title has never been disputed.

No. 1 is bounded:
Mauka by Aupuni
Koolau by pali of Keopuka
Makai by sea shore and Liloa
Wailuku by Keopuka Aina.

No. 2 is bounded:
Mauka and all sides by Aupuni.

N.T. 6v7
No. 3715B, Kekuahani, July 18 1849

Inihia, sworn,

Section 1 - Taro pasture in Keopuka.
Section 2 - Taro pasture in Loiloa.
Section 3 - Olona pasture in Loiloa.

Land from Ikoa in 1839.

Section 1:
Mauka by Government road
Hana by Keopuka pali
Makai by Liloa/Keopuka pali
Wailuku by Ke.

Section 2 - Surrounded by government boundaries.

[Award 3715B; R.P.7518; Loiloa Haiku Koolau; 2 ap.; .48 Ac.; See No. 5250D for F.T. document; 5250D not awarded]

A.1 03715B Keuoho, Luka

Number: 03957B

Claim Number:	**03957B**		
Claimant:	**Keuoho, Luka**		
Other claimant:	Kenoha		
Other name:			
Island:	**Maui**		
District:	**Koolau**		
Ahupuaa:	**Makaiwa, Kolea, Moolua, Punaluu**		
Ili:	**Punaluu**		
Apana:	**5**	Awarded:	**1**
Loi:		FR:	
Plus:		NR:	
Mala Taro:		FT:	
Kula:		NT:	**439v5**
House lot:		RP:	**4109**
Kihapai/Pakanu:	2	Number of Royal Patents:	**1**
Salt lands:		Koele/Poalima:	**No**
Wauke:		Loko:	**No**
Olona:		Lokoia:	**No**
Noni:		Fishing Rights:	**No**
Hala:		Sea/Shore/Dunes:	**No**
Sweet Potatoes:		Auwai/Ditch:	**No**
Irish Potatoes:		Other Edifice:	**No**
Bananas:		Spring/Well:	**No**
Breadfruit:		Pigpen:	**No**
Coconut:		Road/Path:	**No**
Coffee:		Burial/Graveyard:	**No**
Oranges:		Wall/Fence:	**No**
Bitter Melon/Gourd:		Stream/Muliwai/River:	**No**
Sugar Cane:		Pali:	**No**
Tobacco:		Disease:	**No**
Koa/Kou Trees:		Claimant Died:	**No**
Other Plants:		Other Trees:	
Other Mammals:	**No**	Miscellaneous:	

No. 3957B, Luka or Kenoha, See K, July 2, 1849
N.T. 439v5

Kalama, sworn, He has seen Luka's land Makaiwa in Koloa of Koolau land it is an old land from Kauluha before 1819.

Section 1:
Mauka by Waonahele
Hana by Kekua's land
Makai by pali
Hamakua by Nawaihi's land.

Section 2 Kihapai in Punaluu.
Mauka by Ku
Hana and Makai by pali
Hamakua by stream.

Section 3 Kihapai in Kolea.
Mauka by Pahupu's land

Hana and Makai by pali
Hamakua by Pahupu's land.

No one has objected to him.

[Award 3957B; R.P. 4109; Kolea Koolau; 2 ap.; .91 Ac.; Makaiwa Koolau; 1 ap.; 13 Acs; Moloa Koolau; 1 ap.; .19 Ac.; Punalau Koolau; 1 ap.; .88 Ac; Punaluu Koolau; 3 ap.; 1.36 Acs]

Cultural Impact Assessment
for the Kolea Reservoir Decommissioning Project,
Kolea Ahupuaʻa, Hāna District,
Maui Island
TMK: [2] 1-1-001:050

Prepared for
Oceanit Laboratories, Inc.

FINAL

Prepared by
Colleen Medeiros Dagan, B.S.
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawaiʻi, Inc.
Maui, Hawaiʻi
(Job Code: MAKAIWA 2)

July 2010

Oʻahu Office
P.O. Box 1114
Kailua, Hawaiʻi 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Maui Office
1993 Main Street
Wailuku, Hawaiʻi 96793
Ph: (808) 242-9882
Fax: (808) 244-1994

Acknowledgements

Cultural Surveys Hawai‘i (CSH) would like to extend our thanks and gratitude to the people who have contributed their time and personal knowledge to this study. Without the assistance of these individuals, this study would not have been possible. Many thanks to Mr. Garrett Hew who put CSH in contact with the Tateyama family of Kailua and Waikamoi, East Maui. It is difficult to find individuals familiar with remote locations such as those of the study area and our gratitude goes out to this family for taking the time to share their knowledge and memories for this study.

Management Summary

Date	July 2010 (FINAL)
Project Number (s)	CSH Job Code: MAKAIWA 2
Project Location	Kolea Reservoir and Dam, Kolea Ahupua‘a, Hāna District, Maui Island, TMK (2) 1-1-001:050
Land Jurisdiction	State: Department of Land and Natural Resources (DLNR) Private (Lessee): East Maui Irrigation Company (EMI)
Agencies	Private: East Maui Irrigation Company State: State of Hawai‘i Department of Land and Natural Resources
Project Description	At the request of Oceanit Laboratories, Inc., Cultural Surveys Hawai‘i, Inc. conducted a Cultural Impact Assessment (CIA) for the Kolea Reservoir Decommissioning Project, Kolea Ahupua‘a, Hāna District, Maui Island, TMK (2) 1-1-001:050. Through an assessment conducted by the State of Hawai‘i, Department of Land and Natural Resources, Engineering Division, it was found that the Kolea dam and reservoir are no longer necessary. The intent of the decommissioning project is to breach the existing dam and restore the reservoir its natural streambed environment.
Region of Influence (ROI)	The area of direct effect for the proposed undertaking is considered the approximate 4-acre area of potential effect (APE). When assessing the presence or absence of direct, indirect, and cumulative effects of the project on the traditional cultural practices of this region, traditional use and access to resources from the mountains to ocean, or *mauka* to *makai* must be taken into consideration. As such, the ROI for this undertaking is defined as the geographic area encompassing the *ahupua‘a* of Kolea.
Regulatory Context	This cultural impact assessment was conducted per the requirements of the Hawaii State Office of Environmental Quality Control (OEQC) subject to Hawai‘i Administrative Rules (HAR) Title 11 Chapter 200-4(a) and Chapter 343 of the Hawai‘i Revised Statutes (HRS). This cultural impact assessment follows the Guidelines for Assessing Cultural Impacts as set forth by the OEQC.
Fieldwork Effort	Field work was conducted by Todd McCurdy M.A. and Colleen Medeiros Dagan, B.S. and consisted of a field inspection of Kolea, Waikamoi and O‘opuola Streams. Interview with the Tateyama family

	of Kailua was conducted by Colleen Medeiros Dagan, B.S.
Recommendations	Based on the background research of the area and the community consultation process, it is recommended that the best management practices regarding stream restoration be enforced during the decommissioning process as eventual restoration of this portion of Kolea Stream takes place. All efforts should be made to reduce silt runoff downstream and maintain a healthy stream environment. Additionally, it is recommended that *mauka-makai* access be maintained to both the bamboo forest for the collection of *takenoko* (bamboo shoots) and potential gathering of other forest resources as well as access to the coast for fishing. Finally, a sensitive approach should be taken as the decommissioning of the Kolea Reservoir proceeds with regards to the legal issues ongoing between EMI and east Maui taro farmers.

Table of Contents

List of Figures

List of Tables

Section 1 Introduction

1.1 Project Background

At the request of Oceanit Laboratories, Inc., Cultural Surveys Hawai‘i, Inc. conducted a Cultural Impact Assessment (CIA) for the Kolea Reservoir Decommissioning Project, Kolea Ahupua‘a, Hāna District, Maui Island, TMK (2) 1-1-001:050 (Figure 1 and Figure 2). Through an assessment conducted by the State of Hawai‘i, Department of Land and Natural Resources, Engineering Division, it was found that the Kolea dam and reservoir are no longer necessary as the reservoir had not been in use for several years. The intent of the decommissioning project is to breach the existing dam and restore the reservoir its natural streambed environment. As part of this process, the proposed restored section of Kolea stream will include the creation of a series of spillways or check dams constructed of stacked cobbles in an effort to control sediment runoff.

The area of potential effect (APE) is approximately 4 acres, and is hereafter referred to as the "project area", while the entire *ahupua‘a* of Kolea is considered the ROI and will be researched and hereafter referred to as the "study area". Because Kolea Ahupua‘a is relatively small, research of neighboring *ahupua‘a* was conducted in an effort to compare the similarities and potentially apply the neighboring model to Kolea.

1.2 Scope of Work

The following scope of work was carried out for this study:

1. Examination of historical documents Land Commission Awards, historic maps, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal and other resources or agricultural pursuits as may be indicated in the historic record.
2. A review of the existing archaeological information pertaining to archaeological sited within the study area to reconstruct traditional land use activities and to identify and describe the cultural resources, practices and beliefs associated with the parcel and identify present uses, if appropriate.
3. Interviews with persons knowledgeable about the past and present cultural practices in the project area and its surrounding area. We anticipate both formal and informal interviews.
4. Preparation of a report on items 1-3 summarizing the information gathered related to traditional practices and land use. The report will assess the impact of the proposed undertaking on the cultural practices and features identified.

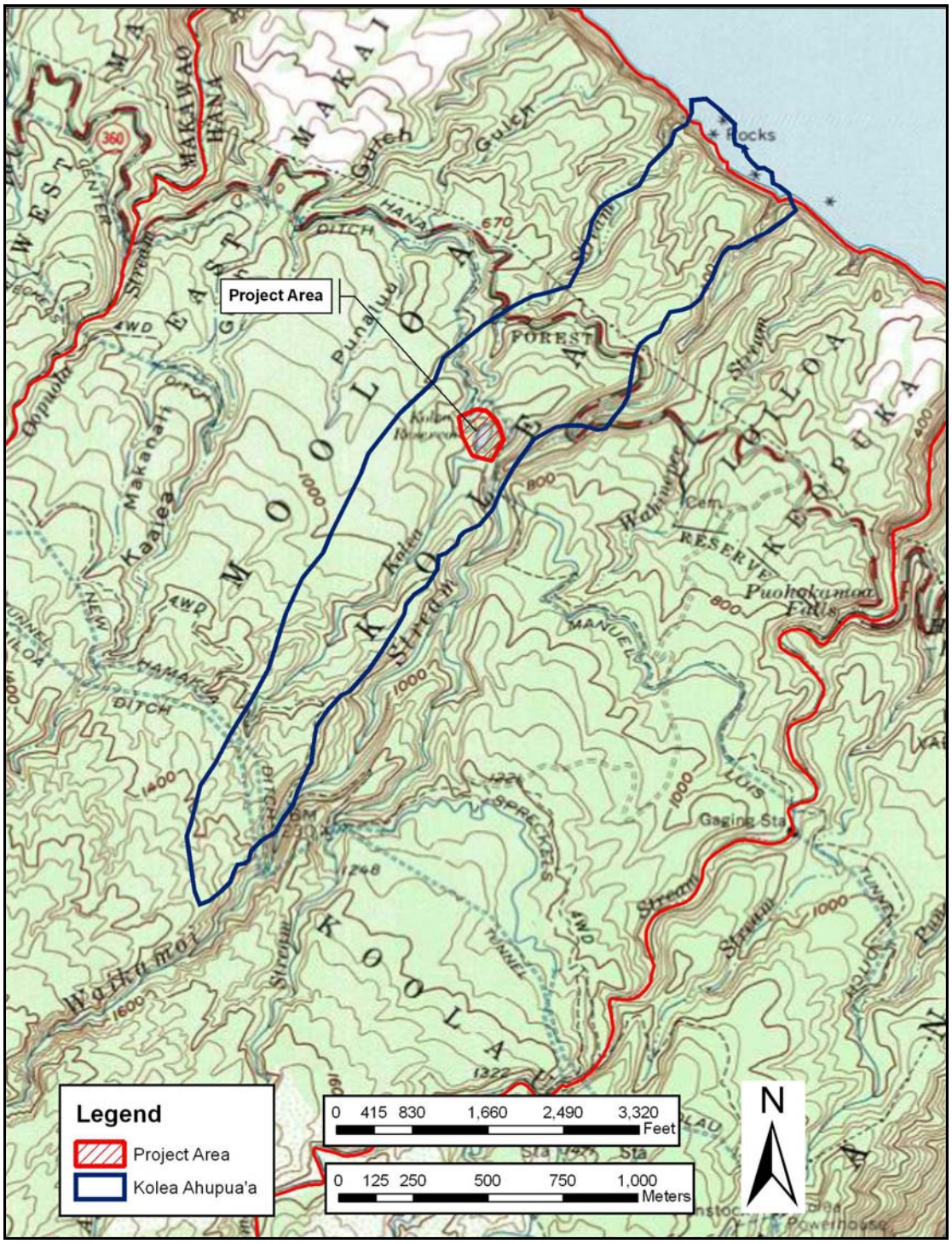


Figure 1. A portion of the USGS 7.5’ topographic map, Ke‘anae Quadrangle (1983) showing both the project area and overall study area.

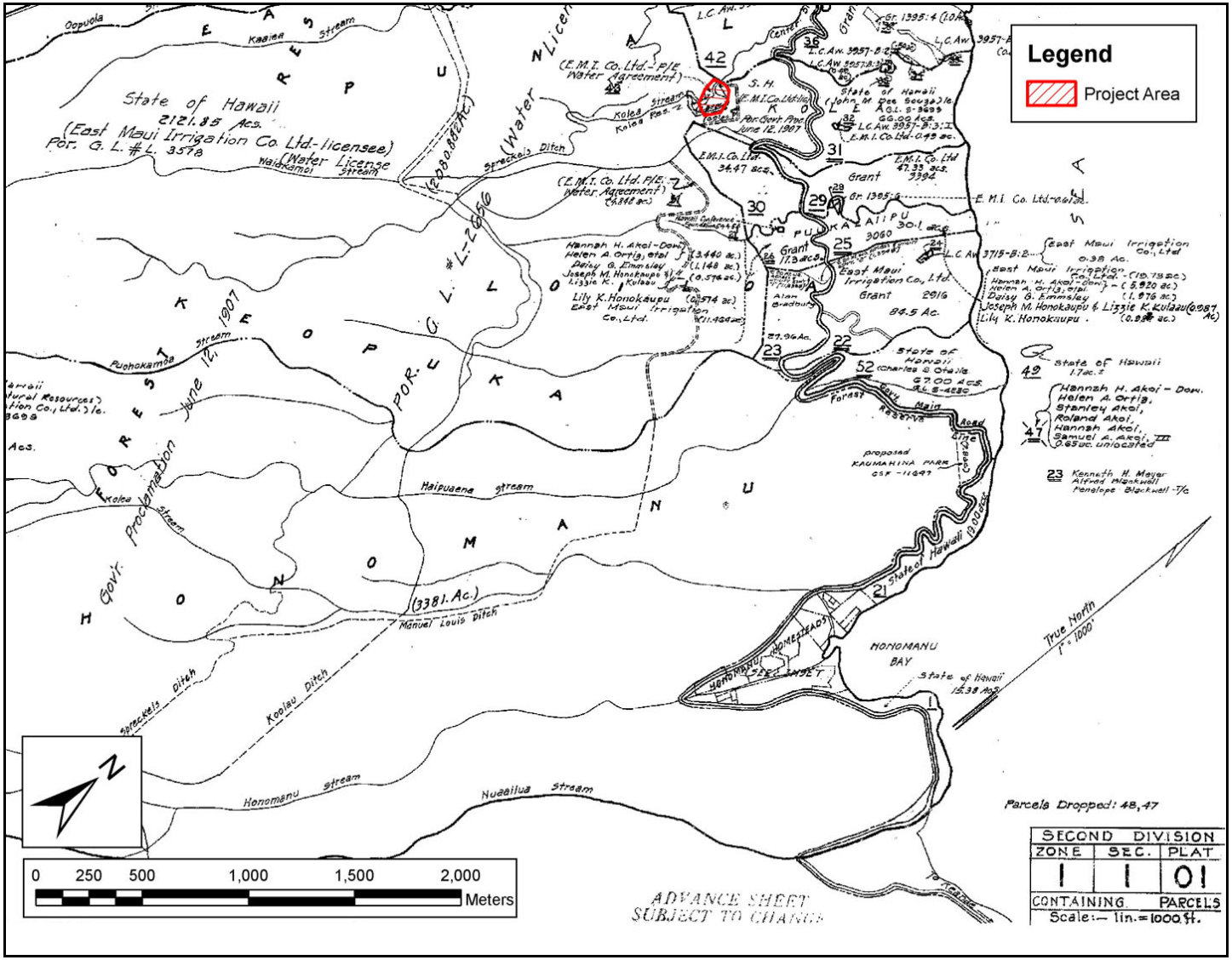


Figure 2. A portion of TMK (2) 1-1-001 showing the location of the project area.

1.3 Environmental Setting

1.3.1 Natural Environment

Kolea Ahupua‘a is located in between Mo‘oloa Ahupua‘a to the west and Loiloa Ahupua‘a to the east. The Kolea Reservoir is located along Kolea Stream at the 800-foot contour and approximately 1.15 kilometers from the coastline (Figure 3). Soils in the area are described as Rough Mountainous Land (rRT). Occurring in mountainous areas throughout the Hawaiian Islands, it consists of very steep land broken up by numerous intermittent drainage channels. The soils of the rRT soil unit are shallow with the representative stratigraphy generally consisting of 0-25 cm of soil over saprolite. (Foote et al. 1972:119).

The average rainfall in the vicinity of the project area is between 120” and 160” with the heaviest rainfall occurring in the winter months (Giambelluca et al. 1986:57). In this region of the island the soil type and precipitation rate support a wet forest and woodland ecosystem (Pratt and Gon 1998). As a result of land alteration activities associated with water diversion the ecosystem has been modified. The current environment around the Kolea Reservoir consists of introduced florae including Swamp mahogany (*Eucalyptus robusta*), Chinese banyan (*Ficus microcarpa*), Paperbark (*Melaleuca quinquenervia*) and Moreton Bay fig (*Ficus Macrophylla*).

1.3.2 Built Environment

While water diversion ditches built for the irrigation of sugarcane wind throughout the Ko‘olau Moku, The built environment of the project area is limited to the features of the Kolea Reservoir and an un-improved access road that begins near the Waikamoi Forest Ridge trailhead ends atop the crest of the reservoir dam (Figure 3). A wood-framed catwalk extends from the crest of the dam approximately 12 m straight out into the reservoir with a control wheel at its end, presumably to open and close the outlet. The exiting water is re-directed from Kolea Stream into the center ditch for the purpose of irrigation.

Figure 3. Overview of the Kolea Reservoir, view north.

Section 2 Methods

2.1 Field Methods

In an effort to attain a more thorough understanding of the topography of the study area and likelihood for crop cultivation, fishing resources and forest resources, as well as evidence of historic and pre-contact habitation, a field visit of the Kolea, Waikamoi and the O‘opuola streams was conducted. The fieldwork component of the cultural impact assessment was accomplished on June 8, 2010 by CSH archaeologists and historical researchers, Todd McCurdy, M.A. and Colleen Medeiros Dagan, B.S., under the general supervision of Hallett H. Hammatt, Ph.D. The fieldwork required approximately 6.5 person-hours to complete.

2.2 Document Review

Background research included a review of previous archaeological studies and mitigation plans on file at SHPD/DLNR and a review of documents, books and maps at the Cultural Surveys Hawai‘i library. Land Commission Award documentation was researched using the Waihona ‘Āina online database and previous reports. Additionally, documents, books and maps were consulted at the Maui Historical Society and Wailuku Public Library. Other sources such as the World Wide Web were utilized as needed.

2.3 Scoping and Community Outreach

2.3.1 Government Agencies, Advisory Councils, Local Community Organizations and Hawaiian Cultural Practitioners

In order to identify individuals with knowledge of the traditional cultural practices of the area of potential effect for the proposed project as it relates to this study, CSH initiated contact with government agencies, advisory councils, and local community organizations (Section 4). Letters and project area maps showing the location of the Kolea Ahupua‘a were mailed out with the following accompanying text ():

> At the request of Oceanit Laboratories, Inc., Cultural Surveys Hawai‘i, Inc. (CSH) is conducting a Cultural Impact Assessment (CIA) for the proposed Kolea Reservoir Decommissioning Project, located in Kolea Ahupua‘a, Hāna District, Maui Island, TMK (2) 1-1-001:050. An archaeological inventory survey of the project site is also being conducted by CSH along with the CIA. The Kolea Reservoir is located along Kolea Stream at the 800-foot contour and approximately 1.15 kilometers from the coastline (Figures 1 & 2).
>
> The purpose of this project is to decommission the dam at Kolea Reservoir. East Maui Irrigation Co., Ltd. currently owns and operates the reservoir and associated dam that was originally built in 1901. With funding from the State of Hawai‘i, the plan is to remove a portion of the existing embankment in order to make the dam non-functional. The amount of flow to Kolea Stream will remain unchanged.

The area in and around the reservoir that will be affected is approximately 4 acres. For the CIA portion of this project, the entire Kolea Ahupua‘a will be researched.

The purpose of the CIA is to evaluate potential impacts to traditional cultural practices as a result of the proposed project.

We are seeking your *kōkua* or help and guidance regarding the following aspects of our study:

General history and present and past land use of the project area.

Knowledge of cultural resources which may be impacted by the Kolea Reservoir Decommissioning Project - for example, traditional plant gathering sites, historic sites, archaeological sites, and burials.

Knowledge of traditional gathering practices in the area – both past and ongoing.

Cultural associations of the project area, such as legends and traditional uses.

Referrals of *kūpuna* or elders who might be willing to share their cultural knowledge of the project area and the surrounding *ahupua`a* lands.

Any other cultural concerns the community might have related to Hawaiian cultural practices within the Kolea Ahupua‘a and/or in the vicinity of the proposed Kolea Reservoir Decommissioning Project area.

We invite you to contact us, Anna Cordova and/or Colleen Medeiros Dagan, at 1-808-242-9882. You may also contact us by e-mail at acordova@culturalsurveys.com and cdagan@culturalsurveys.com if you have any information you would like to share.

Mahalo,

Anna Cordova, Archaeologist

Colleen Medeiros Dagan, Archaeologist

Section 3 Background Research

The division of Maui's lands into political districts occurred during the rule of Kaka‘alaneo, under the direction of his *kahuna*, Kalaiha‘ōhi‘a (Beckwith 1970:383). This division resulted in twelve districts during traditional times: Honua‘ula, Kahikinui, Kaupō, Kīpahulu, Hāna, Ko‘olau, Hāmākua Loa, Hāmākua Poko, Wailuku, Ka‘anapali, Lahaina, and Kula. The current project area is located on the windward flank of Haleakalā in the traditional district or *moku* of Ko‘olau and *ahupua‘a* of Kolea.

This section contains a summary of the rich traditional historic background associated with the Ko‘olau Moku. In addition, this section details the previous archaeological investigations in the vicinity of the current project area.

3.1 Traditional and Historical Background

3.1.1 Mythological and Traditional Accounts

Ko‘olau Moku, on the northeast coast of Maui is located in between Hāmākua Loa Moku to the west and Hāna Moku to the south. A translation of *Ko‘olau* is "windward" (Pukui, et al. 1974:117). Although Ko‘olau Moku extends from O‘opuola Pt. to beyond Nahiku, the lands from Ke‘anae to Wailua are considered to be representative of the traditional cultural landscape for the Ko‘olau region as a whole (Handy, et al. 1991:499-501).

Oral tradition passed from down from one generation to the next provides valuable insight into the pre-Contact cultural landscape of Ko‘olau Moku. The waters that feed this verdant region were said to have been brought forth by the god Kāne, who thrust his *kauila* staff into solid rock to bring forth the waters of Ke‘anae (Beckwith 1970:64). Another tale tells of a famous shark of Ko‘olau called Hi‘u (the tail of a fish) (Sterling 1998:109; Youngblood, et al. 1983:92):

> According to this story, two families in the area used to exchange food, a common practice, the couple living seaside at Ke'anae giving fish and the couple living upland giving garden produce.
>
> One day the woman from the shore gave her sister-in-law on the hillside nothing but a fishtail in exchange for bananas and sweet potatoes. The woman took the fishtail home in her calabash, saying nothing about the scanty trade.
>
> That night both she and her husband dreamed of a shark, and when they woke up in the morning they found a live shark swimming around in the calabash, where only a tail had been the night before.
>
> The excited couple freed the shark in an upland pool and made offerings to it. During a heavy rain, the shark was washed down to the ocean, where…it lives to this day in an underground cave near Ke'anae wharf.

Studies of the history of land use indicate that lands within the Ko‘olau Moku were intensively and continuously used for wetland taro cultivation or *lo‘i* agriculture from the pre-Contact era up until the present day (Group 70 International, et al. 1995; Handy, et al. 1991)(Figure 4). Ke‘anae typically sets the example for traditional pond field cultivation in the Ko‘olau Moku. Although it is unique because it was engineered by ancient Hawaiians. The Ke‘anae peninsula and was not naturally an ideal location for *lo‘i,* as it was mostly barren lava. It is said that in an effort to empower Ke‘anae from the neighboring Wailua, an unnamed chief ordered his subjects to carry soil down from the valley, where they lived at the time, to the peninsula where they literally deposited this soil which over the years became the productive *lo‘i* systems present today (Handy, et al. 1991:500). In addition to extensive *lo‘i* terracing and associated temporary habitation features, Land Commission Award testimony also indicates that the cultivation of the *olona* plant and gathering of *olona* fibers were also important parts of the traditional economy in the Ko‘olau area.

With regard to political influence and the course of Hawaiian history, it has been noted that there may have been some rivalry within Ko‘olau Moku between the *ahupua‘a* of Ke‘anae and neighboring Wailuanui. This rivalry, however, would give way to larger political battles concerning the rule of Maui Island and the line of succession between the sons of Pi‘ilani (Kamakau 1992:22-29), and later, the consolidation of power and unification of the Hawaiian Islands under Kamehameha (Group 70 International, et al. 1995).

Chief Pi‘ilani united all of Maui under his rule during the 16th or 17th century. Pi‘ilani’s sons Lonopi‘ilani and Kiha-a-Pi‘ilani fought for control of Maui. Kiha-a-Pi‘ilani eventually took refuge at Hāna. While in Hāna, Kiha-a-Pi‘ilani took as his wife Koleamoku, who had been betrothed to Lonopi‘ilani, which again put the two brothers to warring. Kiha-a-Pi‘ilani and his wife Koleamoku fled to Hawai‘i Island to enlist the aid of Umi. Umi was married to Pi‘ikea, the daughter of Pi‘ilani (sister of Lonopi‘ilani and Kiha-a-Pi‘ilani), a marriage that had formerly brought peace between the islands of Hawai‘i and Maui. However, Umi sided with Kiha-a-Pi‘ilani and sent an invasion fleet to Hāna. In Hāna, at Ka‘uiki, Lonopi‘ilani's forces, under the command of Ho‘olaemakua, withstood the Hawai‘i forces for a while until a nighttime raid overwhelmed them. With this battle Kiha-a-Pi‘ilani gained control of Maui. Kiha-a-Pi‘ilani "is credited with finishing the paved road around the island (Ke Alaloa o Maui), which his father (Pi‘ilani) had begun ... and restoring Honua‘ula *heiau* just inland of Pu‘u Ka‘uiki" (Griffin 1987:9).

During the last half of the 18th century the battles between Maui and Hawai‘i were carried on by the high chiefs Kahekili of Maui and Kalani-‘opu‘u of Hawai‘i. Kalani-‘opu‘u was in control of the Hāna and Kīpahulu areas from ca. 1759 to 1765 when Kahekili won out. However, the Hawai‘i forces were able to regain control from ca. 1775 to 1783. In 1778, when Capt. James Cook’s ships returned from their North American explorations, they stopped off Hāna but didn’t land. Kalani-‘opu‘u and Kamehameha both visited Cook’s ships, indicating who controlled the Hāna area. With the death of Kalani-‘opu‘u in 1782, Kahekili regained control of Hāna, which he retained, though not without further battles with Hawai‘i Island forces (i.e. Kamehameha), until his death in 1794. With the death of Kahekili and the assistance of newly acquired foreign power (canons, muskets, men) Kamehameha gained control not only of Maui, but of all the Hawaiian Islands, except Kaua‘i, by 1795.

Figure 4. Portion of the Dodge 1885 map showing the location of Kolea Reservoir in relation to traditional land divisions.

3.1.2 Early Historic Period

Following western contact and unification of the islands under a single ruler, and as a result of the shift from traditional Hawaiian land tenure to one based on western principles of private ownership through the execution of the Māhele, the influx of foreign interests and the introduction of rice as a cash crop began to change the cultural demographic of Ko‘olau Moku. The Hawaiian communities became more concentrated rather than dispersed throughout the region following the mid-19th century Māhele. When opportunities for land purchases through Royal Patent Grants arose, Hawaiians from the Ke‘anae area began to acquire these grants primarily for *kula,* or pasture lands, as either a single owner or as a *hui* or co-op (Linnekin 1983:185; 1985:24-25). There were twenty-one Royal Patent Grants issued in the Ke‘anae region (769.35 acres) alone, all but one going to Hawaiians (Linnekin 1985:24-25). The primary thrust, it seems, for the formation of the *hui* ventures and acquisition of these *kula* lands was to regain access to upland resources. A corollary effect of the formation of these land *hui* and the acquisition of *kula* lands was a greater retention of acreage by Hawaiians from Ke‘anae, thus effectively preventing foreign interests from developing sugar plantations or cattle ranches along the *mauka* portions of the region (Linnekin 1983:181-185).

In the second half of the 19th century, the market for rice grew markedly with an increasing demand from Chinese laborers working on the sugar plantations in Hāna. With a pond field irrigation system already in place in Ke‘anae, the region was ripe for conversion from taro cultivation to rice. It was common practice for Chinese entrepreneurs to lease former *lo‘i kalo* lands from Hawaiian owners for rice cultivation (Group 70 International, et al. 1995:28). Tax records for 1890 indicate that the rice lands in Ke‘anae and Wailuanui comprised approximately 67.84 acres out of a total of 163.322 acres in pond-field agriculture. Two years later, this number rose to 75 acres in Ke‘anae and Wailuanui while other lands on Maui (Honokowai, Waikapu, Wailuku, Waiehu, and Waihe‘e) registered a combined acreage of 175 (Group 70 International, et al. 1995:28) and (Linnekin 1985:30). The Chinese farming community flourished in Ke‘anae and with an increase in population came improvements to infrastructure needed to support more people as well as to facilitate accessibility to this once remote region of Maui. These improvements included the opening of the historic Hāna Belt Road and construction of necessary buildings associated with the rice plantations. Rice farming however would decline sharply following 1910 and by 1935 it had ceased entirely (Group 70 International, et al. 1995:36-37).

3.1.3 Land Commission Awards in the Immediate Area

Following the Great Māhele of 1848, two *kuleana* Land Commission Award (LCA) claims were awarded in the general vicinity of the Kolea Reservoir (see Table 1, Figure 5). The LCA information suggests that into the mid-19th century, the area surrounding the reservoir maintained a limited population with an economy focused on wetland agriculture. In addition there were also claims for *olona* and *kīhīpai*.

Table 1. Land Commission Awards near Kolea Reservoir (Waihona ‘Aina 2002).

LCA #	Claimant	Apana	‘Ili	Land Use
03715-B	Kekuahani	n=3	Keopuka, Loiloa	Lo‘i and Olona
03957-B	Keuoho, Luka	n=5	Punaluu	Agriculture

LCA #	Claimant	Apana	‘Ili	Land Use
	and Kenhoa			

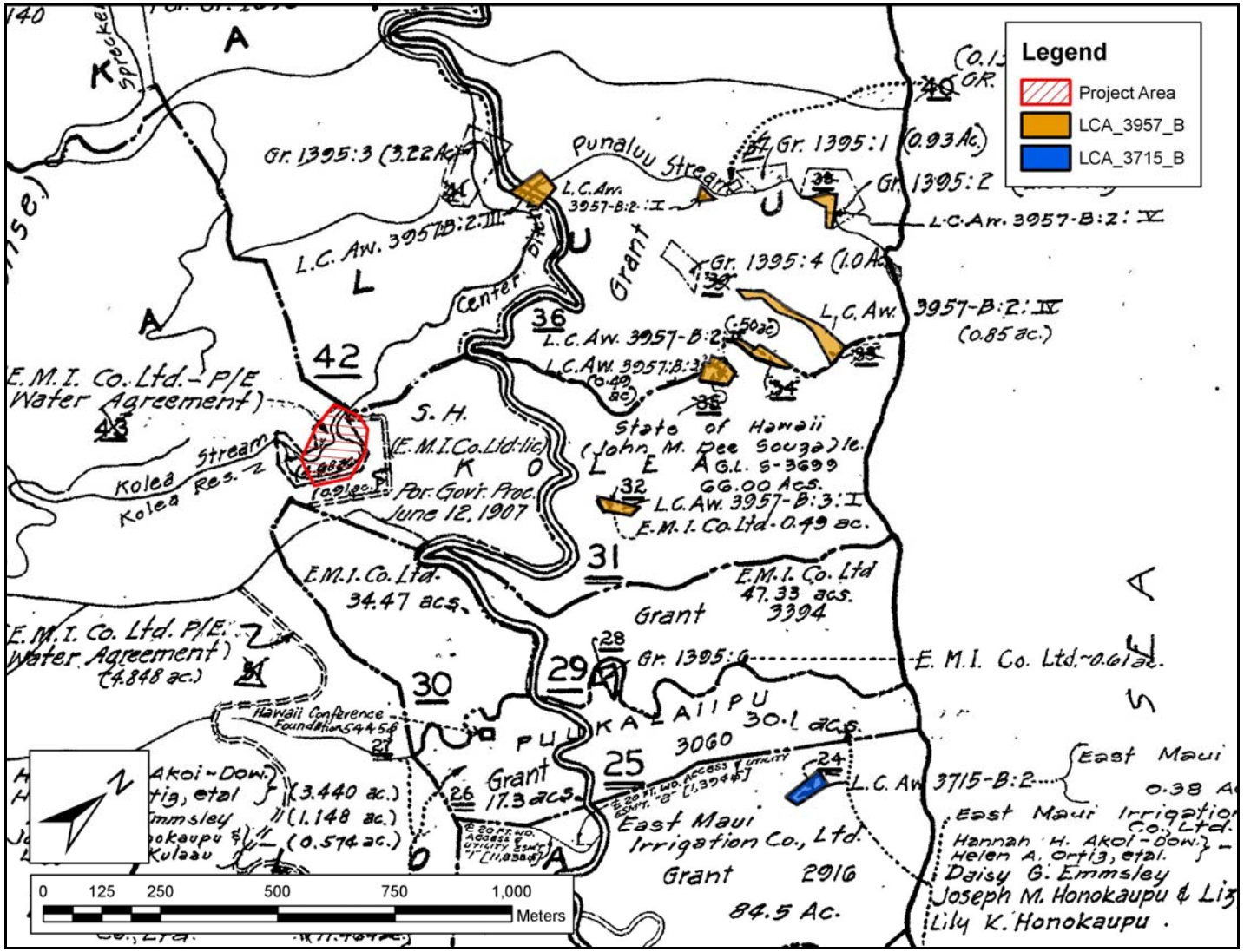


Figure 5. A portion of TMK (2) 1-1-001 showing LCA claims in Plat 001 in relation to the Kolea Reservoir.

3.1.4 1900s

Following the annexation of the Hawaiian Islands as a Territory of the United States in 1898, a county system of government was adopted. By 1905, Maui County had elected its first Board of Supervisors, hired its first road engineer, and established a system to appropriate money for road improvements (Maui News 1926) The “Belt Road” connecting Kahului with Hāna was given a high priority, with a general plan for its completion in place by 1910.

Prior to the construction of the Belt Road to Hāna, horse trails, developed when engineers constructed ditch systems between East Maui and the central Maui isthmus, were the only means of overland travel. Inter-island steamships made regular stops at the Ke‘anae Landing, but were considered expensive ($2.00 for deck passage). Travelers leaving Ha‘ikū on horseback for Ke‘anae descended and ascended 22 major valleys before arriving at Ke‘anae. Along the way, the traveler would have visited Native Hawaiian villages at Huelo, Kolia, Waiakamoi, Wahinepe‘e, Puahokamoa and Honomanū (Maui News 1926).

Writer George Bowser traveled to Ke‘anae on horseback in 1879, and described the village:

> My next halting place was the little hamlet of Keanae. There are here only few Kanaka huts and some patches of taro cultivation, but it is just the spot for the growth of the sugar cane, and has the benefit of a very good landing at which the steamer “Mokolii” calls about once a month. Mr. J.C. Garrett has a sugar plantation here, which was a delight to the eyes, as a contrast to the forest scenery I had been passing through. There are something like 2,000 acres here, all virgin land, capable of being turned account for the cultivation of the sugar cane.
>
> The native huts are generally constructed of a framework of bamboo, with something more substantial for uprights with rafters of bamboo for the roof. Over these a covering is laid of the native grass called pili, which will last for twenty years and will withstand the heaviest rains. Some huts, however, are covered with lauhala, which is the leaf of the puhala tree. The natives sometimes cook inside their huts. The sleeping place is on a raised platform about a foot and a half from the floor, and is covered with two or three layers of matting, also made of lauhala. I found these matting beds very comfortable to sleep upon and very suitable to the climate.
>
> Wailua is the name of the next place I arrived at, some two miles further on. Near the road from Keanae to here are several beautiful waterfalls. These, in the summertime, are beautified by perpetual rainbows. The Wailua Valley is about two miles square. There are here a church and a school house and a number of native houses, some of which are built of wood. For shooting, there is an abundance of wild turkeys and wild goats; plenty of fish of various sorts are always close at hand, oranges and wild bananas, mountain apples and guavas, all to be had for the picking.
>
> There is, in this part of the island, a species of taro which does not require irrigation. It is planted in rows the same way we plant potatoes, and it comes to

> maturity within the same time as the other species which needs to constantly be covered with water viz.: in about twelve months from the time of planting (Maui News 1926).

By 1922, the Belt Road had been completed between Kuiaha and Kakipi Gulch. In 1923, the County Board of Supervisors requested more prison labor for roadwork between Kailua and Ke‘anae. While road work continued toward Ke‘anae, survey work commenced between Ke‘anae and Kopili‘ula. In June 1925, the grand opening of the Kailua-to-Ke‘anae portion of the Belt Road was celebrated by a procession of automobiles to Ke‘anae. Territorial Governor Wallace Farrington dedicated the opening of the road with County Board of Supervisors Chairman Samuel Kalama and others (Maui News 1926) (Figure 6).

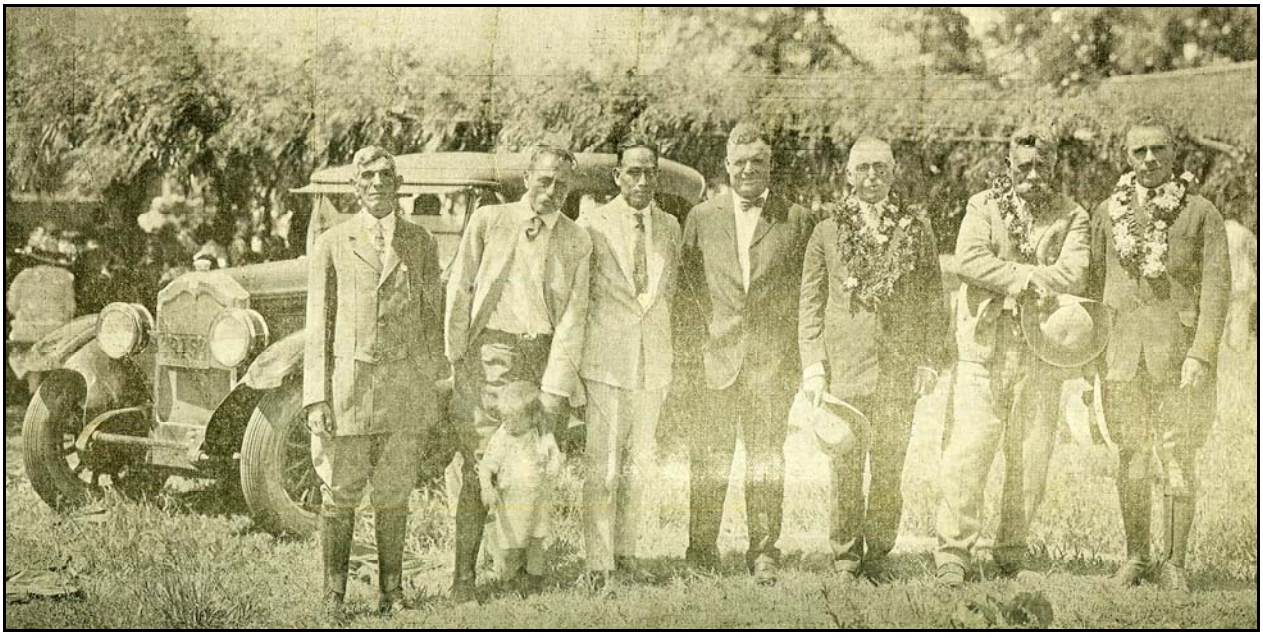


Figure 6. A group of Maui County Supervisors pose with Governor Farrington in Ke‘anae. Left to right: R.A. Drummond, W.F. Kaae, County Engineer P. Low, Sheriff C. Crowell, Governor W. Farrington, Chairman S. Kalama and D.T. Fleming.

On April 1, 1946 a *tsunami* generated by an earthquake in the Aleutian Islands off the coast of Alaska, struck the Ke‘anae Peninsula. The height of the *tsunami* run-up over two separate spots at Wailua was measured at 4.8 meters (15.7 ft.) and at 5.1 meters (16.7 ft.) (World Data Center 1977). The Lanakila Ihiihi O Iehowa Ona Kaua Congregational Church, constructed of coral and stone on the Ke‘anae Peninsula between 1857 and 1863, was the only structure left standing when the *tsunami* receded (Bartholomew 1994). Today, Ke‘anae and Wailua are a fretwork of working taro fields, small residential areas, and parks. Residents live on higher ground in Wailua, and send their children to school in Hāna, some 14 miles away.

3.2 Archaeological Studies

This section provides a brief overview of the research and findings of previous archaeological investigations in the general area of the current project (Figure 7 and Figure 8). Investigations including the current project area are discussed next followed by a summary of those conducted nearby (Table 2).

While there is a relatively high density of historic properties recorded within Ko‘olau Moku (Figure 8 and Table 3), few archaeological investigations have been conducted in the study area. Formal archaeological research began on Maui early in the twentieth century when Thomas Thrum began recording the *heiau* of Maui in the Hawaiian Annual from 1909 through 1918. By the conclusion of his study, Thrum had located 121 *heiau* on Maui (Thrum 1916). At the same time, J.F.G. Stokes documented many structures and heiau in Maui (Stokes 1917). However, the first attempt at a systematic island –wide survey was undertaken by Winslow Metcalf Walker from 1928 to 1929. The survey was commissioned by the Bishop Museum and focused on large sites and *heiau* around the island.

Table 2. Archaeological studies in the general vicinity of Kolea dam.

Author(s)/ Date	Location	Nature of Work	Findings
Stokes 1918	Island-wide	Search for heiau structures	Identified seven heiau in Ko‘olau Moku.
Walker 1931	Island-wide	Island-wide archaeological survey with a primary focus on monumental and/or ceremonial archaeology	Identified 20 heiau in Ko‘olau Moku, noted ten destroyed.
Palama 1981	Wailua Homestead	Archaeological field inspection	No findings
Group 70 et al. 1995	Keanae/Wailuanui	Archaeological inventory survey in conjunction with a cultural landscape study of the Wailua Nui and Ke‘anae irrigated taro complex	Identified three distinct taro field systems and defined the overlying cultural landscape of the region.
Haun and Henry 2003	Wailuanui Ahupua‘a	Archaeological inventory survey	Pre-contact temporary habitation site and trail

Stephen Palama (1981) conducted an archaeological field inspection of approximately 3.16 acres within Wailua Homesteads. This cursory field inspection did not locate any new historic properties.

Kukui o Puni Heiau (SIHP 50-50-07-096) was further described during a more recent archaeological cultural landscape investigation of three separate taro field systems found at Wailuanui and Ke‘anae (Group 70 International, et al. 1995).

Haun and Henry (2003) conducted an archaeological inventory survey of approximately 4 acres at Pauwalu in Wailuanui Ahupua‘a. The inventory survey resulted in the identification of one historic property, SIHP 50-50-07-5237, consisting of an overhang (Feature A) and trail (Feature B). The overhang was interpreted as a pre-contact temporary habitation shelter that was occupied between AD 1420-1650 and the trail as a transportation route.

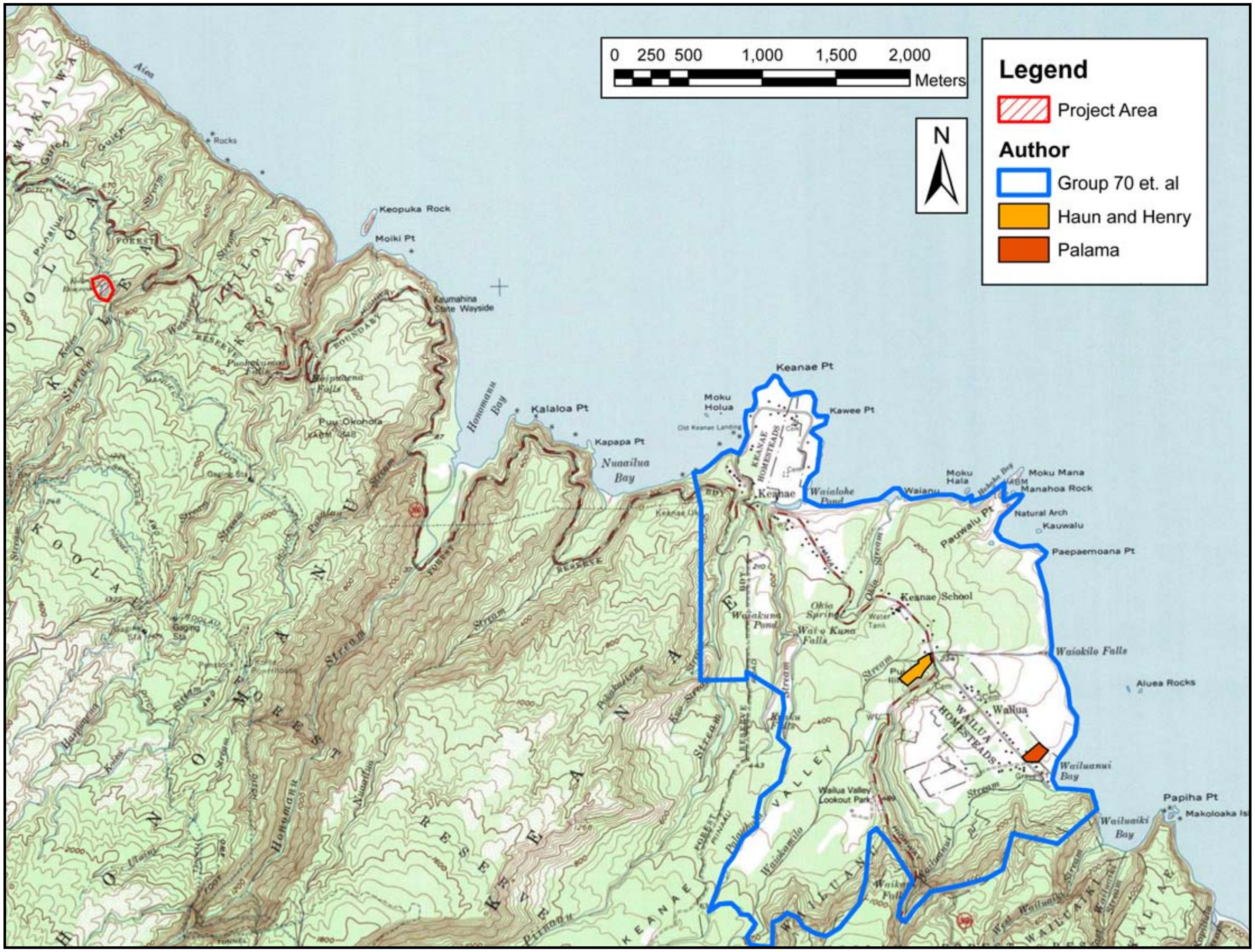


Figure 7. A portion of the 1983 Keanae 7.5-minute USGS topographic quadrangle showing previous archaeological studies in the vicinity of Kolea Reservoir

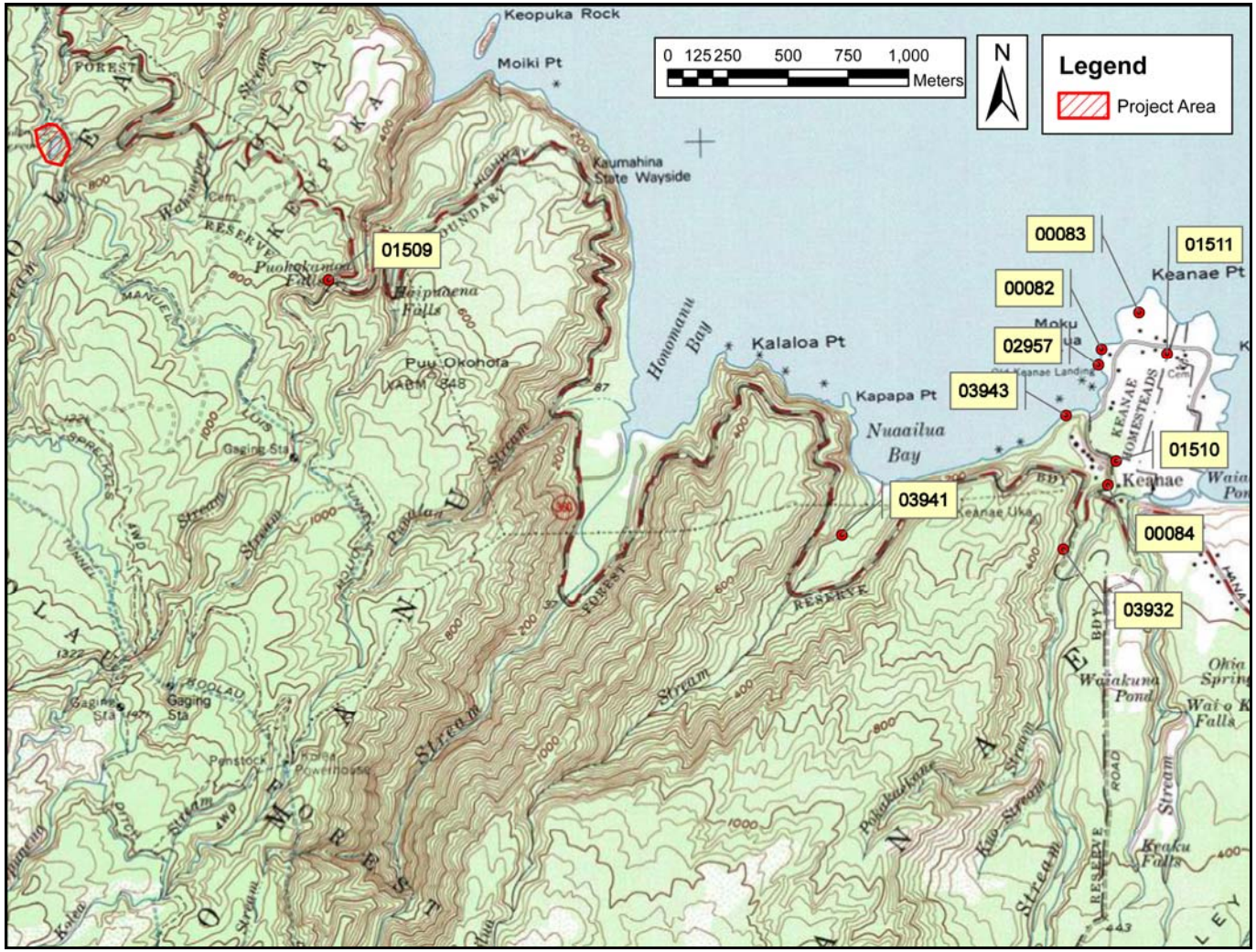


Figure 8. A portion of the 1983 Keanae 7.5-minute USGS topographic quadrangle showing the locations (Department of Land and Natural Resources, State Historic Preservation Division [DLNR/SHPD] 2004) of previously documented historic properties in relation to the Kolea Reservoir.

Table 3. Brief descriptions (Department of Land and Natural Resources 2004; Haun and Henry 2003) of previously documented historic properties in relation to the Kolea Reservoir

SIHP# 50-50-07-	Name	Ahupua‘a	Comments
00082	Kukuiolono Heiau	Ke‘anae	Destroyed
00083	Laloa Heiau	Ke‘anae	Destroyed
00084	Pakanaloa Heiau	Ke‘anae	Reported as a war heiau to Kanehikili; Destroyed
01509	Puohokamoa Bridge	Honomanu	Constructed in 1912, placed on Hawaii Register of Historic Places in 1974.
01510	Lin Hing Society Building	Ke‘anae	Placed on Hawaii Register in 1974; disassembled
01511	Lanakila Church	Ke‘anae	Established 1856
02957	Ke‘anae Landing	Ke‘anae	Historic boat/steamship landing
03932	Ke‘anae Arboretum Taro Complex	Ke‘anae	Comprised of 14 lo‘i and a main ‘auwai
03941	Nua`ailua Taro Complex	Ke‘anae	Site -03941 appeared to be an old, unmodified complex of lo`i sitting above and below Hana Highway. No size estimate given by CSH (1994 survey).
03943	Ke‘anae Quarry	Ke‘anae	Consists of historic quarry with rock crusher still in place. A stone platform within the quarry boundaries is said to be the grave of a worker killed in a quarry accident.

Section 4 Community Consultations

Cultural Surveys Hawai‘i Inc. contacted the following individuals and Hawaiian organizations requesting their *kōkua* and guidance regarding knowledge of traditional cultural practices and cultural resources of the study area. The following table represents all community consultations conducted with *kama‘āina*, Hawaiian cultural advisors and Hawaiian organizations. Individuals who expressed personal knowledge of the study area and gave their consent to share their *mana‘o* for this study, both formally and informally, are presented in Table 4. Formal letters of response to the scoping letter sent out by CSH have been appended to this study as Appendix B .

Table 4. Community Contacts

Name	Affiliation	Contacted[1]	Personal Knowledge (Y/N/S)	Comments
Mr. Terry Akuna	*Kama‘āina* from Wailua	N	Y	Referred by Mrs. Coochie Cayan-SHPD
Jas Akuna	*Kama‘āina* from Wailua	A	--	Referred by Nicole Spalding
Mr. Timothy Bailey	Aha Kiole Advisory Council	Y	--	CSH mailed formal letter of inquiry. Mr. Bailey e-mailed list of *kūpuna*.
Ms. Leslie Bruce	*Kama‘āina*	A		Referred to CSH by Mrs. Joann Carriera.
Mrs. Joann Carriera	*Kama‘āina* from Hana	A	--	Referred by Mrs. Thelma Shimaoka - OHA
Mrs. Mele Carroll	State Representative	A		Referred by Mrs. Coochie Cayan-SHPD
Ms. Phyllis “Coochie” Cayan	DLNR-State Historic Preservation Division, History and Culture Branch Chief	Y	S	CSH sent letter of inquiry. Mr. Cayan made referrals to Terry Akuna, Virgil Day, Kyle Nakanelua, Ed Wendt, Sen. Kalani English, Rep. Mele Carroll the Hawaiian Studies instructor at Hana High School and the Hana Senior Citizen community center. See

[1] Key:

Y=Yes
N=No
A=Attempted (at least 3 attempts were made to contact individual, with no response)
S=Some knowledge of project area
DC=Declined to comment
DP=Declined to participate
U=Unable to contact, i.e., no phone or forwarding address, phone number unknown

Name	Affiliation	Contacted[1]	Personal Knowledge (Y/N/S)	Comments
				Appendix B
Melody Cosma-Gonslaves	Teacher, Hawaiian Studies-Hana High School	A	--	Referred by Mrs. Coochie Cayan-SHPD
Mr. Virgil Day	*Kama‘āina* from Ke‘anae	A		Referred by Mrs. Coochie Cayan-SHPD
Jas Emmsley	Possible *Kama‘āina* from Ko‘olau Moku	N	N	Individual contacted not familiar with area.
A. Emmsley	Possible *Kama‘āina* from Ko‘olau Moku	A		Unable to contact.
Senator Kalani English		A		Referred by Mrs. Coochie Cayan-SHPD
Mr. Garrett Hew	East Maui Irrigation (EMI) employee	Y	S	Referred CSH to Mrs. Jean Igarashi and Mr. Stephan Cabral
Mrs. Hokulani Holt-Padilla	Cultural Practitioner – Maui Arts and Cultural Center	Y	N	Mrs. Holt-Padilla has a daughter who lives in Hana. Said she will try to contact her.
Ishay Honokaupu	Possible *Kama‘āina* from Ko‘olau Moku	A		Phone number out of service.
Severino M. Honokaupu	Possible *Kama‘āina* from Ko‘olau Moku	A		Unable to contact.
Ms. Pauahi Hookano		A		Unable to contact.
Mr. Bob and Mrs. Jean Igarashi	Granddaughter of Mr. Gojiro Tateyama, original ditch man for Waikamoi Stream	Y	Y	Formal Interview, See 5.2.1
Kahu Charlie Maxwell	Cultural Practitioner	Y	N	CSH sent letter of inquiry.
Ms. Nicole McMullen	Bailey House Museum/Maui Historical Society	Y	S	CSH sent letter of inquiry.
Mr. Kyle Nakanelua	*Kama‘āina* from Ke‘anae	A	--	Referred by Mrs. Coochie Cayan-SHPD. Phone number not in service.
Ms. Katrina Olivera	Ph.D in Geology (Maui)	Y	N	Ms. Olivera referred CSH to Pauahi Hookano of Wailua.
Ms. Terri Poaipuni	*Kama‘āina* from Hāna	A	--	Referred by Mrs. Thelma Shimaoka - OHA
Mr. Kiope Raymond	Maui Community College Hawaiian Language Professor	Y	N	CSH sent letter of inquiry. Mr. Raymond referred CSH to Ms. Katrina Kapa Olivera Ph.D.
Mrs. Thelma	Office of Hawaiian	Y	S	CSH sent a letter of inquiry. Ms.

Name	Affiliation	Contacted[1]	Personal Knowledge (Y/N/S)	Comments
Shimoaka	Affairs, Community Outreach Specialist Maui Island			Shimaoka referred CSH to Terri Poaipuni, Hoopai Waikoloa, Makala Waring, Rose Soon, Joann Carreira, and Timmy Bailey.
Mr. Stanley Solamillo	Maui County Cultural Resources Commission	Y	N	CSH sent a letter of inquiry.
Ms. Rose Soon	*Kama‘āina* from Hāna	Y	N	Referred by Mrs. Thelma Shimaoka - OHA
Mr. Mike Spalding	*Kama‘āina* lineal ties to Hāna	Y	S	CSH mailed formal letter of inquiry. See 5.1.3
Ms. Nicole Spalding	*Kama‘āina* lineal ties to Hāna	Y	N	Referred CSH to the Akuna family.
Hoopai Waikoloa	*Kama‘āina*	N	--	Referred by Mrs. Thelma Shimaoka - OHA
Makala Waring	*Kama‘āina* from Hāna	Y	N	Referred by Mrs. Thelma Shimaoka - OHA
Ed Wendt	*Kama‘āina* from Ke‘anae	Y	S	Mr. Wendt was Referred by Mrs. Coochie Cayan-SHPD. See 5.1.4
	Hana Senior Center	Y	N	Spoke with woman who said that the kūpuna at the Hana Senior Center are from Hana and likely not familiar with the CIA study area.
	Central Maui Hawaiian Civic Club	A		

Section 5 Kama‘āina Interviews

5.1 Informal Interviews

5.1.1 Stephen Cabral

Mr. Cabral was born in Nahiku, Maui in 1929. He went to work for East Maui Irrigation (EMI) after graduating from Hana High School in 1947. Most of his early jobs with EMI involved converting old California redwood ditches, ditch linings and flumes to new concrete conduits. In some cases, because of the curing time for the concrete that was being used, work was required to proceed around the clock.

Mr. Cabral explains that EMI had good sources for what he referred to as “Haleakala basalt” that was utilized as aggregate for the concrete. Mr. Cabral stated that this basalt came from a quarry at Honomanu Bay. He explains that due to the quality of this basalt, much of the concrete work done by Mr. Cabral remains in good condition with minimal cracking.

Regarding the Kolea Dam, he explains that all of the dam components seen there today dates to the original work done at the turn of the century. The stone work at the face of the dam, obscured today by bamboo, was delivered to the site by mule and ox and dumped in place from the stream level up. Earth was packed behind the dam face, and some rock was used from blasting at the spillway and from creating the rock face cut just south of the spillway. All rip-rap surfaces at the reservoir and at the lower water diversion ditch were hand-built. All cutting was by hand and by explosives. Concrete improvements at the Center Ditch diversion continued through the 1970’s, but he had not heard about any concrete work done there since. The reservoir walkway was an improvement constructed sometime in the 1970’s, prior to that, the reservoir control was built into the side of the reservoir dam crest.

5.1.2 Sam Ka‘ai

Mr. Sam Ka‘ai, *kūpuna* and cultural practitioner, is from Hāna and is familiar with the study area. He is aware of the water rights issues in process between EMI and east Maui taro farmers. Mr. Ka‘ai is skeptical of the motives of EMI as water rights have been used for political gain in the past. Mr. Ka‘ai asserts that globally we are in a time of imbalance.

Mr. Ka‘ai did share that Kolea stream was a place known for stone tool manufactureing, such as poi pounders. Because these items were formed here, discards could also be found here. He also said that taro patches and rice fields were cultivated along this stream until approximately 1946.

Mr. Ka‘ai also shared information about surrounding areas such as Honomanu. He said that the area and bay was called Hanamanu before the reign of Pi‘ilani. This area was a place of birds. The *koa‘e ula* or red-tailed tropicbird (*Phaethon rubricauda*) and the *koa‘e kea* the white-tailed tropical bird (*Phaethon lepturus*) both lived here. According to Mr. Ka‘ai, they are ground nesting birds and their populations at Honomanu have declined since the introduction of rats and mongoose. Another bird found within the CIA study area is the *kolea* or the golden plover (*Pluvialis fulva*). Mr. Ka‘ai said the *kolea* is known as the navigational bird because it migrates a

great distance between Hawai‘i and Alaska. Mr. Ka‘ai also shared the meaning of the place name Ke‘anae. He said that Upper Ke‘anae was known as Ke‘anae pi‘ina‘au, or the small intestines due to the narrow windy roads of the area. Ke‘anae was also referred to as the *pinao* or dragonfly. Mr. Ka‘ai explained that the Civil Conservation Corp now known as the YMCA planted all the exotic trees along the Hana Highway in this area. Mr. Ka‘ai said that yams of a white variety were known to grow along the coast of the study area and were known as *palaoa* which referred to their white coloring.

5.1.3 Mr. Mike Spalding

Mr. Mike Spalding is a *kama‘āina* with lineal ties to Hāna. Mr. Spalding is an avid swimmer, sailing canoe enthusiast, and boat captain. He described an observation he made while swimming past Makaiwa Bay (located two ahupua‘a west of Kolea) in the early morning hours. He observed a *puka* (hole) in the *pali* or cliff side from which the sun shone through casting rays that extended out in a bird like shape. It occurred to him that may be the reason the area is named "Makaiwa" the *puka* being the eye or m*aka* and the sun coming through it forming the *iwa* bird.

Mr. Spalding has also explored this valley on foot and said that there are remnant Hawaiian agricultural terraces. He describes the bay as being sheltered from the trade winds and northeast and northwest ocean swells. He thought researching the name of the western point of the bay, Kapuka‘amaui might offer some insight to the use or significance of the area. He was curious as to why the reservoir was being decommissioned.

5.1.4 Mr. Ed Wendt

He explained that he is involved in the water rights issues between east Maui taro farmers and East Maui Irrigation that include 27 rivers and streams in east Maui. He stated that the Kolea and the Waikamoi streams of the CIA study area are two of the 27 rivers and stream involved. East Maui taro farmers are demanding the release of water back into these streams. Mr. Wendt explained that although no one lives along the Kolea and Waikamoi Streams today, taro *lo‘i* were once located along their banks. Mr. Wendt explains that healthy streams need water flowing in them. He continues stating that care needs to be taken with regards to the earth’s natural process. He further notes that water has become a commodity used for development.

5.1.5 Anonymous Couple

While performing a filed inspection of the Kolea and Waikamoi stream valleys for this study, CSH team encountered a couple (who requested to remain anonymous) in the process of collecting *takenoko* (bamboo shoots). They were kind enough to describe the harvesting process explaining that you first find the bamboo shoots that are two to three feet high, then you remove the top 12 inches and pull of excess husks or leaves exposing is the edible portion. This couple said that they lived in Wailuku and traveled to this location specifically for collecting *takenoko*. They explained that the location is a known *takenoko* gathering area often utilized by senior citizens who are driven here by small bus.

5.2 Formal Interview

One formal interview was conducted for this study with the Tateyama family from Kailua, Maui. The digitally recorded interview was performed on May 19, 2010 at Bob and Jean Igarashi's home in Waipahu, Oahu. Mrs. Colleen Medeiros Dagan B.S. preformed the interview. The interview has been summarized by extracting traditional and cultural information. The Tateyama family requested that the full transcription of the interview remain private and not be amended to this document.

5.2.1 Tateyama 'Ohana: Mr. Bob and Mrs. Jean Igarashi, Mrs. Maureen Farineau and Mr. Shawn Tanaka

Mrs. Jean Igarashi and Mrs. Maureen Farineau are sisters who grew up in Kailua on the island of Maui, approximately two miles northwest of Kolea ahupua'a. Their father, Masato Tateyama was the fifth son born to Gojiro Tateyama and his wife, Tsuru Wakasugi. Gojiro Tateyama, born July 15, 1879, was a Japanese immigrant from Kenboku Mura, Tamana Gun, Kumamoto, Japan. Gojiro arrived in Honolulu on September 11, 1899. He came over on the ship, COPTIC. Tsuru, born on April 5, 1877, was from Oshima-Gun, Yamaguchi, Japan. She arrived in Hawaii on January 30, 1898 onboard the SS Mogul.

Figure 9. Gojiro Tateyama and his wife Tsuru Wakasugi (Photo courtesy of the Tateyama family).

When Gojiro arrived on Maui, he attained a job as a ditch man working for East Maui Irrigation Company (EMI) where his wages were $15.00 a month. He was responsible for keeping the irrigation ditches around Puohokamoa and Waikamoi clear of debris. A home was built for him along Waikamoi Stream. Jean and Maureen clarify that the area they knew as Kolea was close to the highway and extended towards the ocean, while upland or *mauka* was referred to as "Waikamoi". Gojiro and Tsuru had eight of their eleven children while living along the Waikamoi Stream. Their home was located *mauka* of the branch of the Kolea Stream and while living there Gojiro planted a variety of fruit trees including orange and grapefruit. Jean explained that Gojiro had brought bamboo from Japan and planted it around his house for *takenoko* or bamboo shoots. Jean and Maureen said that much of their grandfather's and their father's food was grown and gathered from around their home and the surrounding area. They used salt to preserve perishable foods.

Gojiro lived at this remote location along the Waikamoi Stream until 1915 when he moved his family to Kailua. He had three more children while living in Kailua. It was said that during this time the Hana Highway that extended beyond Kailua was a mule trail traversed on foot or on horseback. As children growing up in Kailua, Jean and Maureen recall visiting Waikamoi with their grandfather and father. Their father Masato, also known as "Masa", was the eldest son and was responsible for caring for his parents in their later years. Because of this Japanese tradition, Masa stayed in Kailua and raised his own family there. All of Gojiro's eleven children were sent to boarding schools. The girls attended Maunaolu Seminary and the boys attended Lahainaluna. And all except Masa left Kailua to live and raise their families elsewhere throughout the state.

As children growing up in Kailua, Jean and Maureen recall many excursions into Waikamoi Valley. They said that the main reason they visited was because their father, like their grandfather, attained a position with EMI and became responsible for the ditches of the area. Often times when he had to check on a ditch, he would take Jean and Maureen with him:

> *Maureen*: When he needed to see if any ditches needed to be cleaned of debris after a storm of branches.
>
> *Jean:* We helped.
>
> *Maureen:* Sometimes we would go to different reservoirs and turn that wheel to increase the water flow down the stream or close it more so that the reservoir would fill.

While out with their father they would swim in the ponds and collect fruits and *takenoko* or bamboo shoots. They were taught to take only what you needed for one or two meals:

> *Maureen* : We enjoyed, he would take us to the pond to swim.
>
> *Jean:* The taro leaf, when the grandchildren were little, dad would take water from the stream and use the leaf as a cup.
>
> *Maureen:* Just to see the crystal clear water roll off the taro leaf. That was shared with anybody who came with us, because you don't experience that in your yard, it was special from a fresh water stream. There was times when we would go

> fishing for catfish, in some of the ponds, but we always came back with enough food, mountain apple, rose apple, oranges, *pohole*, we would eat that raw too, and other days we caught *`opae* just enough for home use.

The sisters describe their father, Masa, as being very "fussy" about utilizing these resources properly and not wasting. Maureen describes how her father made nets for catching `opae:

> The net was made with guava branch.
>
> The branch with a Y was crossed and tied at the free end into an elliptical shape. Then mesh netting was over-sewn on the branch leaving one side open to form a 10" pouch. Attached (sewn) to the bottom of the mesh netting was a narrowburlap bag tunnel extension for the caught shrimp which had an opening at the end and tied so you could empty out what was caught in the extension. The net was placed perpendicular to the floor of the stream at it's width. Since the *`opae* hid under rocks, another person nearby upstream would slightly move the rocks to allow the *`opae* to float with the current downstream into the net.

Maureen said that she believes her father learned how to fashion an *'opae* net from Hawaiian friends that he worked with. Maureen also mentioned catching gold fish and frogs (frog legs) for their family's consumption. She explains that they were the only Japanese family living in Kailua amongst Hawaiian families, Filipino families and a Portuguese family.

Gojiro developed an arboretum in their back yard which Masa later cared for. He planted fruit trees and flowers, sweet potato and bougainvillea. He would give away flowers to anyone who wanted or needed. Masa had a natural affinity for nature and plants. He simply enjoyed growing plants, tending to them and sharing them with others. Maureen recalls the enjoyment she experienced being outdoors and gathering flowers with her grandfather.

While in Kailua, the Tateyama family continued the Japanese tradition of welcoming the New Year together. All relatives who lived on outer islands would fly back to Kailua for the celebration. Gojiro would raise a pig for the occasion and plant sweet potato and taro. The Filipino Castillo family slaughtered the pig for them and utilized the parts they liked, then the Tateyama's prepared *kalua* pig in a traditional Hawaiian *imu*. They pounded their own *poi* from either taro and when they didn't have taro, they pounded *ulu* or bread fruit. They said they learned and adopted Hawaiian traditions from the Hawaiian families they lived near. Their father's best friend, James Hueu, farmed the *lehua* variety of taro and watercress in Ke‘anae who often left large bags of the crops at the Tateyama household. To add to their multi-cultural lifestyle, they remember the stone oven that their Portuguese neighbors used for cooking bread, and recall with fondness eating the Portuguese bread.

In addition to their adopted Hawaiian traditions, they practiced the traditional Japanese tradition of pounding *mochi* (glutinous rice). Jean describes the stone bowl (*usu*) and guava wood pounders (*kine*) they used to pound the *mochi*. Maureen said they had adult sized *kine* and child sized as well. They steamed sweet mocha rice in a four level tray over an outdoor fire for their New Year celebration. Jean recalls having fresh cooked rice in hand as the *imu* was opened hoping for a piece of the crispy pork skin to eat with the rice.

Gojiro and Tsuru opened the Tokunaga Store in Kailua around 1919. Their home, store and town was the last settlement before Ke‘anae, much like today. This store became a pit-stop for families traveling to and from Ke‘anae and Hāna. Here they sold a variety of canned goods, such as pork and beans. They often housed travelers as well.

Figure 10. Tateyama family in front of the Tokunaga Store in Kailua (Photo courtesy of Tateyama family).

Jean and Maureen recall fishing with their grandfather Gojiro along the coast of Kolea. They said they would go to the forest to cut bamboo for their fishing poles and carry them down a cliff where there was a rope for repelling down. They utilized a dirt foot path to access the cliff side. They would fish from this location in the day and at night by the light of a kerosene lamp. They said they caught lobster (*scyllaridae*), *ulua* (*Carangidae sp.*) and eel (*Gymnothorax flavinarginatus*). They said they prepared the eel by filleting it, drying it and grilling it over a

fire. Other fishing areas they utilized fronted Honomanu Bay, further east. Here they caught *āholehole* (*Kuhlia sandvicensis*). Shawn Tanaka, Jean and Maureen's nephew, also familiar with the area said that the fish they caught in the "old days" were larger than any he has caught in modern times. The sisters also recall stories about homes that were located at Honomanu before their time. They produced a map which showed a coastal Waikamoi Village. But Jean and Maureen believe this village was also before their time, possibly established in the early 1900's and settled by Japanese rice farmers or other ditch men (Figure 11).

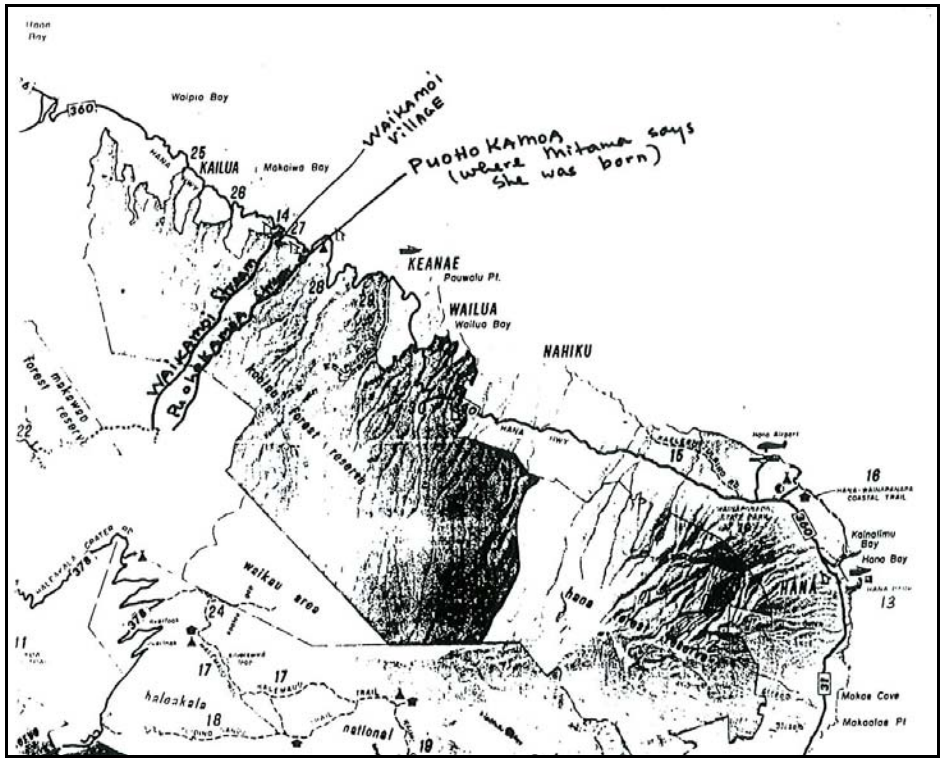


Figure 11. Map courtesy of Tateyama family with hand notation identifying a "Waikamoi Village" as well as the Puohokamoa Stream as being the location of Mitama's, Gojiro's daughter, birth.

In addition, Maureen and Jean recall learning to make hula implements as school children. The said they learned to make *'ulī'ulī* (feather gourd rattles) with chicken feathers and canna seeds for inside the gourd as well as collecting bamboo from a special bamboo patch for *pu'ili* (bamboo stick instruments). They also collected *'ili'ili* (water rounded pebbles) stones from Honomanu Bay.

In closing, Maureen recalls with great fondness the annual EMI *lu'au* in Kailua. She said that employees from Kailua, Ke'anae, Nahiku and Pa'ia would gather in Kailua every year for the event. All the families prepared food for the party and decorated the garage with foliage from the forest. Individuals and families would stay overnight to oversee the *imu*. They prepared *kalua* pig, sweet potato, *poi*, rice, potato salad, *'opae*, *opihi*, *kulolo*, *haupia* raw green onion and quartered round onion with Hawaiian salt, fresh *pohole* and cake. Music and entertainment was provided by any and all who attended.

Section 6 Traditional Cultural Practices

6.1 Hawaiian Habitation and Agriculture

There were two Land Commission Awards (LCA) located in the vicinity of the study area; LCA 3957 B and LCA 3715 B. Of the *apana* awarded for LCA 3957 B, one occurs in the Punaluu Ahupua‘a (immediately northwest of Kolea Ahupua‘a) another two are located in the Kolea Ahupua‘a, while another is located in Makaiwa, (the second *ahupua‘a* northwest of Kolea). Some of these *apana* were described as *kihapai*, small cultivated parcels of land not for use as taro *lo‘i* and for exclusive use by the Native tenant (Lucas 1995). No taro *lo‘i* were noted as being part of this claim.

As for LCA 3715 B, these claims were located in Loiloa, the *ahupua‘a* east of Kolea. This claim was said to contain three *apana*; two for taro pasture, likely dry land taro and one for *olonā* (*Touchardia latifolia*).

In Handy’s *Native Planters* it was said the O‘opuola Gulch marked the northwestern boundary of the Ko‘olau *moku* and that the streams of O‘opuola, Waikamoi (the main stream that feeds the Kolea Stream), Puohokamoa and Haipuena provided water to small *lo‘i*. Also mentioned by individuals consulted for this study was the large stream and valley of Honomanu. It was said that in ancient times this bay and valley supported a small population and that terracing was observed in the valley and that terraces and house sites were located in the flatlands above the valley (Handy, et al. 1991:498).

During field inspections of Kolea, Waikamoi and O‘opuola Streams, it was found that the sections of these streams examined were exceedingly narrow and steep. While the *makai* reaches of these streams were not accessed due to terrain and private property constraints, the observations made during the field visits concluded that cultivation of such rugged mountainous terrain would prove difficult. It is likely that the sparse number of LCA are due to the difficulty of crop cultivation in this marginal growing environment (see also Section 1.3.1 Natural Environment and the soils discussion) and that only the *makai* reaches of the study area at the mouths of the gulches would be suitable for small crop plots as reflected in the LCA claims.

Figure 12. Kolea Stream view west.

Figure 13. Waikamoi Stream view southwest.

Figure 14. O‘opuola Stream view southwest.

6.2 Gathering for Plant Resources

Through the consultation process it was found that there are individuals that currently utilize the study area for the collection of bamboo shoots or *takenoko*, a traditional Japanese food item. The Tateyama family explained that their grandfather brought a bamboo plant from Japan when he immigrated to Hawai‘i. They said that he planted bamboo around his home along the Waikamoi stream to use as a food resource (Section 5.2.1).

While performing a filed inspection of the Kolea and Waikamoi stream valleys for this study, CSH team encountered a couple (who requested to remain anonymous) in the process of collecting *takenoko*. They were kind enough to describe the harvesting process explaining that you first find the bamboo shoots that are two to three feet high, then you remove the top 12 inches and pull of excess husks or leaves exposing the edible portion. This couple said that they lived in Wailuku and traveled to this location specifically for collecting *takenoko*. They explained that the senior citizens also utilize the location and are driven here by small bus (Figure 15 and Figure 16).

Figure 15. *Takenoko* or bamboo shoot harvested from forest adjacent to Kolea reservoir and dam.

Figure 16. Bamboo shoot discarded husks, evidence of *takenoko* harvesting in the study area.

The Tateyama family also collected *takenoko* from the bamboo forests of the study area and from a bamboo patch located near Honomanu Bay. In addition, they collected *pohole* fern from a patch located at Honomanu. The Tateyama family explined that as children accompanying their father to the various ditch systems, they often gathered oranges, mountain apples, guavas and grapefruits.

Mr. Sam Ka‘ai described a white yam known as *palaoa* that was known to grow along the coast of the study area. Isabella Abbot in her book titled *Lā‘au Hawaii Traditional Hawaiian Uses of Plants* describes a white variety of yam called *ke‘oke‘o* which was white on the outside and inside and was used only for eating (Abbott 1992:39). It is possible that the two white yams described are the same variety and that the variation in the name could be a regional variation. In addition it was said that yams or *uhi* were planted throughout eastern Maui (Handy, et al. 1991:182).

6.3 Aquatic Resources

In addition to the plant resources utilized from within and surrounding the study area, both freshwater and marine resources were identified as being located within the study area. The Tateyama sisters described fishing with their grandfather from a cliff side location accessible by way of a rope. They recall cutting their own bamboo poles from the forest and carrying them down the cliff side along the Kolea coast. They describe it as being very rugged and describe following a dirt road to access the cliffs. Maureen Farineau said the cliff was about thirty feet high. She said they caught eel, lobster and *ulua*. The Tateyama family also described fishing and swimming at Honomanu Bay. In addition, it was said that at Honomanu Bay a small settlement existed in ancient times that utilized the bay as a fishing canoe launching site (Handy, et al. 1991:498).

Freshwater resources would include *‘ōpai* (shrimp) caught using a hand crafted fishing net. She described how her father made their nets which were fashioned from a guava stick and burlap bag which he learned how to make them from his Hawaiian co-workers. The net was made as wide as the stream and one would place the net at a location downstream while another lifted rocks upstream which caused the shrimp to either be swept or scared downstream and into the net (see Section 5.2.1.). Maureen also mentioned catching catfish, gold fish and frogs for eating.

6.4 Traditional Hawaiian Sites

Mr. Sam Ka‘ai said the Kolea stream was an area known for making and finding stone tools such as *poi* pounders.

Section 7 Summary and Recommendations

The lands of the study area fall in a remote and rugged section of the Ko‘olau Moku, along Maui’s eastern shore (Section 1.3). This section of East Maui is largely known for its abundant rainfall, sheer valleys, waterfalls and the traditional pond field agricultural settlement of the Ke‘anae peninsula developed in ancient times and in use today. Ke‘anae was a settlement focused in the uplands until an ancient chief ordered his subjects to gather mud from the uplands and with this mud fill in the lava of the Ke‘anae peninsula thus creating the *lo‘i* systems present today. (Section 3.1). Because of the more suitable farming and fishing grounds developed there, the lands of Ke‘anae and Wailua supported the most substantial villages in the Ko‘olau Moku. Closer in distance to the study area is the bay and land area known as Honomanu. Honomanu was said to have supported a small population in ancient time (Section 6). Conversely, the Kolea Ahupua’a is not readily mentioned in the common references related to Hawaiian traditions and mythology.

Throughout the consultation process it was discovered that the Kolea Ahupua’a was more closely tied to Kailua. This connection was developed in historic times when EMI established a base yard in Kailua and the ditch men of the early 1900’s settled there. The Tateyama family was the only family to have lived in Kolea along the Waikamoi stream.

The Tateyama family interviewed for this study were the descendants of first generation Japanese immigrant Mr. Gojiro Tateyama. Mr. Tateyama lived with his wife and eight children along the Waikamoi Stream. Here he planted fruit trees and bamboo. They eventually moved to Kailua but continued to visit lands of the study area. They fished along the coast and like individuals today, they described growing and collecting bamboo shoots, oranges, mountain apples, and *pohole* from within the CIA study area and surrounding lands. In addition to their gathering practices, they adopted several Hawaiian cultural traditions such as pounding *taro* and *ulu* for *poi* as well as preparing food in an *imu* or underground oven. They practiced their own Japanese cultural traditions of celebrating the New Year by pounding sweet *mochi* rice into round cakes. Members of this family developed an affinity and respect for nature and its resources and continue to visit the area as often as they can.

7.1 Recommendations

Based on the background research of the area and the community consultation, it is recommended that the best management practices regarding stream restoration be enforced during the decommissioning process as eventual restoration of this portion of Kolea Stream takes place. All efforts should be made to reduce silt runoff and maintain a healthy stream environment as well as maintaining healthy coastal fisheries located at the mouth of this stream. Although it is understood that the APE is the immediate location of the Kolea Reservoir, the CIA study area includes the entire Ahupua’a of Kole. It is recommended that *mauka* access be maintained within the study area to both the bamboo forest for the collection of *takenoko* (bamboo shoots) and potential gathering of other forest resources.

Finally, a sensitive approach should be taken as the decommissioning of the Kolea Reservoir proceeds with regards to the legal issues ongoing between EMI and east Maui taro farmers.

Section 8 References Cited

Abbott, I.
1992 *Laau Hawaii Traditional Hawaiian Uses of Plants*. Bishop Museum Press, Honolulu.

Bartholomew, G. a. B. B.
1994 *Maui Remembers, A Local History*. Mutual Publishing, Honolulu.

Beckwith, M.
1970 *Hawaiian Mythology*. University of Hawaii Press, Honolulu.

Department of Land and Natural Resources, S. H. P. D.
2004 Geographic Information Systems (GIS) Archaeological Site Data for Maui (Version 2004.02). Hawaii State Historic Preservation DIvision.

Griffin, A.
1987 Report on a Field Inspection of Hana Ranch Inc. Construction Site. State Historic Preservation Division, Department of Land and Natural Resources, Honolulu, HI.

Group 70 International, I., D. McGregor and C. S. Hawai*i.
1995 *Kalo Kunu O Ka ‘Āina A Cultural Landscape Study of Ke‘anae and Wailuanui, Island of Maui*.

Handy, E. S. C., E. G. Handy and M. K. Pukui
1991 *Native Planters in Old Hawaii: Their Life, Lore, and Environment*. Revised ed. Bernice P. Bishop Museum Bulletin 233. Bishop Museum Press, Honolulu,.

Haun, A. E. and D. Henry
2003 *Archaeological Inventory Survey TMK: 1-1-008:015, 023 Land of Pauwalu, Hana District, Island of Maui*.

Kamakau, S.
1992 *Ruling Chiefs of Hawaii*. Revised ed. The Kamehameha Schools Press, Honolulu, HI.

Linnekin, J.
1983 The Hui Lands of Keanae: Hawaiian Land Tenure and the Great Mahele. *Journal of the Polynesian Society* 92:169-188.

1985 *Children of the Land*. Rutgers University Press, New Brunswick.

Lucas, P. F. N. (editor)

1995 *A dictionary of Hawaiian legal land-terms*. Native Hawaiian Legal Corp. : University of Hawai°i Committee for the Preservation and Study of Hawaiian Language, Art, and Culture, Honolulu.

Author.
1926 Valley Isle May Be Proud of Officals. *Maui News* December 4. Wailuku.

Pukui, M. K., S. H. Elbert and E. K. Mookini
1974 *Place Names of Hawaii*. Rev. and enl. ed. University Press of Hawaii, Honolulu.

Sterling, E. P.
1998 *Sites of Maui*. Bishop Museum Press, Honolulu.

Stokes, J. F. G.
1917 Report on the Heiau of Maui. In *Hawaiian Alamanac and Annual for 1913 The Reference Book of Information and Statistics Relating to the Territory of Hawaii, of Value to Merchants, Tourists and Others.*, edited by T. G. Thrum, pp. 125. Thos. G. Thrum, Honolulu, HI.

Thrum, T. G.
1916 Maui’s Heiaus and Heiau Sites. In *Hawaiian Almanac and Annual for 1917*. Hawaiian Gazzette Co., Honolulu, HI.

Waihona ‘Aina
2002 Mahele Database. Waihona ‘Aina Corporation.

Youngblood, R., L. Lueras, C. Lindquist, B. Creamer and K. u. Wong
1983 *On the Hana coast : being an accounting of adventures, past and present, in a land where the hand of man seems to rest lightly*. 1st ed. The Wanderer. Published by Emphasis International Ltd. and Carl Lindquist, Honolulu, HI.

Appendix A Guidelines for Assessing Cultural Impacts from the State of Hawaii Office of Environmental Quality Control

Guidelines for Assessing Cultural Impacts

Adopted by the Environmental Council, State of Hawaii November 19, 1997

1. INTRODUCTION

It is the policy of the State of Hawaii under Chapter 343, HRS, to alert decision makers, through the environmental assessment process, about significant environmental effects which may result from the implementation of certain actions. An environmental assessment of cultural impacts gathers information about cultural practices and cultural features that may be affected by actions subject to Chapter 343, and promotes responsible decision making.

Articles IX and XII of the State Constitution, other state laws, and the courts of the state require government agencies to promote and preserve cultural beliefs, practices, and resources of native Hawaiians and other ethnic groups. Chapter 343 also requires environmental assessment of cultural resources, in determining the significance of a proposed project.

The Environmental Council encourages preparers of environmental assessments and environmental impact statements to analyze the impact of a proposed action on cultural practices and features associated with the project area. The Council provides the following methodology and content protocol as guidance for any assessment of a project that may significantly affect cultural resources.

Background

Prior to the arrival of westerners and the ideas of private land ownership, Hawaiians freely accessed and gathered resources of the land and seas to fulfill their community responsibilities. During the Mahele of 1848, large tracts of land were divided and control was given to private individuals. When King Kamehameha the III was forced to set up this new system of land ownership, he reserved the right of access to privately owned lands for Native Hawaiian ahupua’a tenants. However, with the later emergence of the western concept of land ownership, many Hawaiians were denied access to previously available traditional resources.

In 1978, the Hawaii constitution was amended to protect and preserve traditional and customary rights of Native Hawaiians. Then in 1995 the Hawaii Supreme Court confirmed that Native Hawaiians have rights to access undeveloped and under-developed private lands. Recently, state lawmakers clarified that government agencies and private developers must assess the impacts of their development on the traditional practices of Native Hawaiians as well as the cultural resources of all people of Hawaii. These Hawaii laws, and the National Historic Preservation Act, clearly mandate federal agencies in Hawaii, including the military, to evaluate the impacts of their actions on traditional practices and cultural resources.

If you own or control undeveloped or under-developed lands in Hawaii, here are some hints as to whether traditional practices are occurring or may have occurred on your lands. If there is a trail on your property, that may be an indication of traditional practices or customary usage. Other clues include streams, caves and native plants. Another important point to remember is that, although traditional practices may have been interrupted for many years, these customary practices cannot be denied in the future.

These traditional practices of Native Hawaiians were primarily for subsistence, medicinal, religious, and cultural purposes. Examples of traditional subsistence practices include fishing,

picking opihi and collecting limu or seaweed. The collection of herbs to cure the sick is an example of a traditional medicinal practice. The underlying purpose for conducting these traditional practices is to fulfill one's community responsibilities, such as feeding people or healing the sick.

As it is the responsibility of Native Hawaiians to conduct these traditional practices, government agencies and private developers also have a responsibility to follow the law and assess the impacts of their actions on traditional and cultural resources.

The State Environmental Council has prepared guidelines for assessing cultural resources and has compiled a directory of cultural consultants who can conduct such studies. The State Historic Preservation Division has drafted guidelines on how to conduct ethnographic inventory surveys. And the Office of Planning has recently completed a case study on traditional gathering rights on Kaua'i.

The most important element of preparing Cultural Impact Assessments is consulting with community groups, especially with expert and responsible cultural practioners within the ahupua’a of the project site. Conducting the appropriate documentary research should then follow the interviews with the experts. Documentary research should include analysis of mahele and land records and review of transcripts of previous ethnographic interviews. Once all the information has been collected, and verified by the community experts, the assessment can then be used to protect and preserve these valuable traditional practices.

Native Hawaiians performed these traditional and customary practices out of a sense of responsibility: to feed their families, cure the sick, nurture the land, and honor their ancestors. As stewards of this sacred land, we too have a responsibility to preserve, protect and restore these cultural resources for future generations.

TEXT OF ACT 50, SLH 2000

A BILL FOR AN ACT RELATING TO ENVIRONMENTAL IMPACT STATEMENTS

UNOFFICIAL VERSION

HOUSE OF REPRESENTATIVES H.B. NO, 2895 H.D.1

TWENTIETH LEGISLATURE, 2000

STATE OF HAWAII

A BILL FOR AN ACT

RELATING TO ENVIRONMENTAL IMPACT STATEMENTS.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

SECTION 1. The legislature finds that there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawai’i’s culture, and traditional and customary rights.

The legislature also finds that native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the "aloha spirit' in Hawaii. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on government agencies a

duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.

Moreover, the past failure to require native Hawaiian cultural impact assessments has resulted in the loss and destruction of many important cultural resources and has interfered with the exercise of native Hawaiian culture. The legislature further finds that due consideration of the effects of human activities on native Hawaiian culture and the exercise thereof is necessary to ensure the continued existence, development, and exercise of native Hawaiian culture.

The purpose of this Act is to: (1) Require that environmental impact statements include the disclosure of the effects of a proposed action on the cultural practices of the community and State; and (2) Amend the definition of "significant effect" to include adverse effects on cultural practices.

SECTION 2. Section 343-2, Hawai`i Revised Statutes, is amended by amending the definitions of "environmental impact statement' or "statement" and "significant effect", to read as follows:

"'Environmental impact statement" or "statement" means an informational document prepared in compliance with the rules adopted under section 343-6 and which discloses the environmental effects of a proposed action, effects of a proposed action on the economic [and] welfare, social welfare, and cultural practices of the community and State, effects of the economic activities arising out of the proposed action, measures proposed to minimize adverse effects, and alternatives to the action and their environmental effects.

The initial statement filed for public review shall be referred to as the draft statement and shall be distinguished from the final statement which is the document that has incorporated the public's comments and the responses to those comments. The final statement is the document that shall be evaluated for acceptability by the respective accepting authority.

"Significant effect" means the sum of effects on the quality of the environment, including actions that irrevocably commit a natural resource, curtail the range of beneficial uses of the environment, are contrary to the State's environmental policies or long-term environmental goals as established by law, or adversely affect the economic [or] welfare, social welfare[.], or cultural practices of the community and State."

SECTION 3. Statutory material to be repealed is bracketed. New statutory material is underscored.

SECTION 4. This Act shall take effect upon its approval.

Approved by the Governor as Act 50 on April 26, 2000

2. CULTURAL IMPACT ASSESSMENT METHODOLOGY

Cultural impacts differ from other types of impacts assessed in environmental assessments or environmental impact statements. A cultural impact assessment includes information relating to the practices and beliefs of a particular cultural or ethnic group or groups.

Such information may be obtained through scoping, community meetings, ethnographic interviews and oral histories. Information provided by knowledgeable informants, including traditional cultural practitioners, can be applied to the analysis of cultural impacts in conjunction

with information concerning cultural practices and features obtained through consultation and from documentary research.

In scoping the cultural portion of an environmental assessment, the geographical extent of the inquiry should, in most instances, be greater than the area over which the proposed action will take place. This is to ensure that cultural practices which may not occur within the boundaries of the project area, but which may nonetheless be affected, are included in the assessment. Thus, for example, a proposed action that may not physically alter gathering practices, but may affect access to gathering areas would be included in the assessment. An ahupua'a is usually the appropriate geographical unit to begin an assessment of cultural impacts of a proposed action, particularly if it includes all of the types of cultural practices associated with the project area. In some cases, cultural practices are likely to extend beyond the ahupua'a and the geographical extent of the study area should take into account those cultural practices.

The historical period studied in a cultural impact assessment should commence with the initial presence in the area of the particular group whose cultural practices and features are being assessed. The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs.

The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man made and natural, including submerged cultural resources, which support such cultural practices and beliefs.

The Environmental Council recommends that preparers of assessments analyzing cultural impacts adopt the following protocol:

1. identify and consult with individuals and organizations with expertise concerning the types of cultural resources, practices and beliefs found within the broad geographical area, e.g., district or ahupua`a;

2. identify and consult with individuals and organizations with knowledge of the area potentially affected by the proposed action;

3. receive information from or conduct ethnographic interviews and oral histories with persons having knowledge of the potentially affected area;

4. conduct ethnographic, historical, anthropological, sociological, and other culturally related documentary research;

5. identify and describe the cultural resources, practices and beliefs located within the potentially affected area; and

6. assess the impact of the proposed action, alternatives to the proposed action, and mitigation measures, on the cultural resources, practices and beliefs identified.

Interviews and oral histories with knowledgeable individuals may be recorded, if consent is given, and field visits by preparers accompanied by informants are encouraged. Persons interviewed should be afforded an opportunity to review the record of the interview, and consent to publish the record should be obtained whenever possible. For example, the precise location of human burials are likely to be withheld from a cultural impact assessment, but it is important that

the document identify the impact a project would have on the burials. At times an informant may provide information only on the condition that it remain in confidence. The wishes of the informant should be respected.

Primary source materials reviewed and analyzed may include, as appropriate: Mahele, land court, census and tax records, including testimonies; vital statistics records; family histories and genealogies; previously published or recorded ethnographic interviews and oral histories; community studies, old maps and photographs; and other archival documents, including correspondence, newspaper or almanac articles, and visitor journals. Secondary source materials such as historical, sociological, and anthropological texts, manuscripts, and similar materials, published and unpublished, should also be consulted. Other materials which should be examined include prior land use proposals, decisions, and rulings which pertain to the study area.

3. CULTURAL IMPACT ASSESSMENT CONTENTS

In addition to the content requirements for environmental assessments and environmental impact statements, which are set out in HAR §§ 11-200-10 and 16 through 18, the portion of the assessment concerning cultural impacts should address, but not necessarily be limited to, the following matters:

1. A discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints or limitations which might have affected the quality of the information obtained.

2. A description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken.

3. Ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained.

4. Biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area.

5. A discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken. This discussion should include, if appropriate, the particular perspective of the authors, any opposing views, and any other relevant constraints, limitations or biases.

6. A discussion concerning the cultural resources, practices and beliefs identified, and, for resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site.

7. A discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project.

8. An explanation of confidential information that has been withheld from public disclosure in the assessment.

9. A discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs.

10. An analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place.

11. A bibliography of references, and attached records of interviews which were allowed to be disclosed.

The inclusion of this information will help make environmental assessments and environmental impact statements complete and meet the requirements of Chapter 343, HRS. If you have any questions, please call 586-4185.

Appendix B Formal Letter Responses

Mrs. Thelma Simoka - OHA

Colleen Dagan

From: Thelma Shimaoka [thelmas@oha.org]
Sent: Monday, April 19, 2010 2:45 PM
To: cdagan@culturalsurveys.com
Cc: Dirk Soma; John Rosa
Subject: SPAM-MED: Responding to CSH Job Code: Makaiwa 2

April 19, 2010

Aloha Colleen:

Subject: Cultural Impact Assessment Community Contact Letter for the Kolea Reservoir Decommissioning Project,

Kolea Ahupua'a Hana District, Maui Island, TMK (2) 1-1-001:050

In response to your request in seeking OHA kokua or help and guidance regarding the following aspects of your study dated 4/6 (did not receive until 4/12/10):

- General History and present and past land use of the project area.
- Knowledge of cultural resources which may be impacted by the Kolea Reservoir Decommissioning Project –for example, traditional plant gathering sites, historic sites, archaeological sites, and burials.
- Knowledge of traditional gathering practices in the area – both past and ongoing.
- Cultural associations of the project area, such as legends and traditional uses.
- Referrals of kupuna or elders who might be willing to share their cultural knowledge of the project area and the surrounding ahupua'a lands.
- Any other cultural concerns the community might have related to Hawaiian cultural practices within the Kolea Ahupua'a and/or in the vicinity of the proposed Kolea Reservoir Decommissioning Project area.

Submitted are names of persons thatmay be helpful to your project. These are families that live in the Hana area for many generations and could provide relevant information as above mentioned.

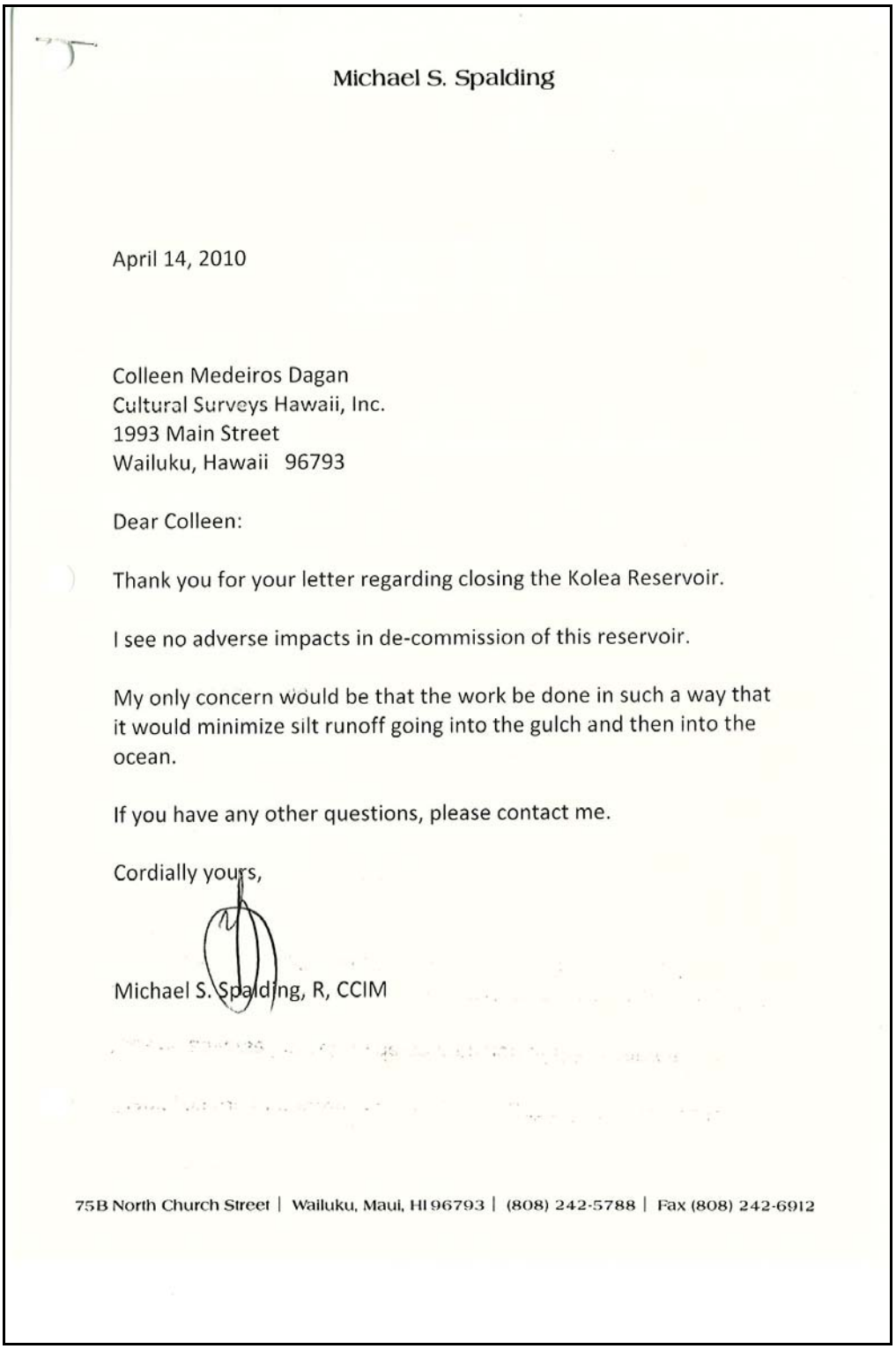
Terri Poaipuni
Hoopai Waikoloa
Makala Waring
Rose Soon
Jo Ann Carreira
Timmy Bailey

Thelma M. Shimaoka
Community Outreach Specialist 3
Maui Island
360 Papa Place, Suite 105
Kahului, HI 96732
T-808-873-3363 F-808-873-3361
Email: thelmas@oha.org

"Ua lehulehu a manomano ke 'ikena a ka Hawai'i"
"Great and numerous is the knowledge of the Hawaiians"

1

Mr. Mike Spalding



Michael S. Spalding

April 14, 2010

Colleen Medeiros Dagan
Cultural Surveys Hawaii, Inc.
1993 Main Street
Wailuku, Hawaii 96793

Dear Colleen:

Thank you for your letter regarding closing the Kolea Reservoir.

I see no adverse impacts in de-commission of this reservoir.

My only concern would be that the work be done in such a way that it would minimize silt runoff going into the gulch and then into the ocean.

If you have any other questions, please contact me.

Cordially yours,

Michael S. Spalding, R, CCIM

75B North Church Street | Wailuku, Maui, HI 96793 | (808) 242-5788 | Fax (808) 242-6912

Mrs. Phyllis "Coochie" Cayan – State Historic Preservation Division, History and Culture Branch

LINDA LINGLE
GOVERNOR OF HAWAII

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

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

April 20, 2010

Ms. Colleen Medeiros Dagan
Ms. Anna Cordova
Cultural Surveys Hawai'i
1993 Main Street
Wailuku, Hawai'i 96793

LOG NO: 2010.0109
DOC NO: 1004.HR04

Dear Colleen Dagan and Anna Cordova:

SUBJECT: Request for Information Regarding a Cultural Impact Assessment (CIA) for the Kolea Reservoir Decommissioning Project, Kolea Ahupua'a, Hāna District, Island of Maui. TMK: (2) 1-1-001:050.

This is in response to your request for any information that might assist your firm in gathering knowledge of traditional cultural practices and/or rights that might be impacted by the above project.

Water is the most precious resource and a critical part of the cultural lifestyle in the Hana District so your request is timely for this community who can best share information for your CIA purposes.

The department is referring you all to talk story with the following whom may be helpful:

1. Terry Akuna, Virgil Day, Kyle Nakanelua, Ed Wendt and other taro farmers of Keanae and Wailua — no contact info available
2. Senator Kalani English — Email: senenglish@capitol.hawaii.gov — #808.587.7225
3. House Representative Mele Carroll — Email: repcarroll@capitol.hawaii.gov — #808.586.6790
4. the Hawaiian Studies instructor at Hana School
5. the Hāna senior citizen community center

Should you have any questions or concerns, please contact our Cultural Historian, Mr. Hinano Rodrigues at 808-243-4640.

Sincerely,

Phyllis Coochie Cayan

Ms. Phyllis "Coochie" Cayan
History and Culture Branch Chief

cc: Mr. Hinano Rodrigues, SHPD Cultural Historian

Appendix C Authorization Forms

Cultural Surveys Hawai'i Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

Providing Excellence in Cultural Resource Management

O'ahu P.O. Box 1114
Kailua, HI 96734
Ph.: (808) 262-9972
Fax.: (808) 262-4950

Maui 16 S. Market St., #2N
Wailuku, HI 96793
Ph.: (808) 242-9882
Fax.: (808) 244-1994

Kaua'i P.O. Box 498
Lawai, HI 96765
Ph.: (808) 245-4883

Authorization and Release Form

Cultural Surveys Hawai‘i (CSH) is grateful for the generosity of the Kūpuna and Kama‘āina who have willingly shared their knowledge and experiences for the preparation of a cultural impact assessment for the Kolea Reservoir Decommissioning Project, East Maui.

We understand our responsibility in respecting the wishes and concerns of the interviewees participating in our assessment. Here are the procedures we promise to follow:

1. You will have the opportunity to review the written transcription of our interview with you. At that time, you may make any additions, deletions, or corrections you wish.
2. You will be given a copy of the interview transcript you have approved for your records.

For our records and yours, we humbly request your confirmation that:

1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You consent to the interview being made available to the public.

I, Robert T. Igarashi, agree to the procedures outlined above and by my
(Please print your name)
signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:

Robert T. Igarashi
(Signature)

6/29/10
(Date)

Cultural Surveys Hawai'i Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

Providing Excellence in Cultural Resource Management

O'ahu P.O. Box 1114
Kailua, HI 96734
Ph.: (808) 262-9972
Fax.: (808) 262-4950

Maui 16 S. Market St., #2N
Wailuku, HI 96793
Ph.: (808) 242-9882
Fax.: (808) 244-1994

Kaua'i P.O. Box 498
Lawai, HI 96765
Ph.: (808) 245-4883

Authorization and Release Form

Cultural Surveys Hawai‘i (CSH) is grateful for the generosity of the Kūpuna and Kama‘āina who have willingly shared their knowledge and experiences for the preparation of a cultural impact assessment for the Kolea Reservoir Decommissioning Project, East Maui.

We understand our responsibility in respecting the wishes and concerns of the interviewees participating in our assessment. Here are the procedures we promise to follow:

1. You will have the opportunity to review the written transcription of our interview with you. At that time, you may make any additions, deletions, or corrections you wish.
2. You will be given a copy of the interview transcript you have approved for your records.

For our records and yours, we humbly request your confirmation that:

1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You consent to the interview being made available to the public.

I, Jean K. Igarashi, agree to the procedures outlined above and by my
(Please print your name)
signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:

Jean K Igarashi
(Signature)

6/29/10
(Date)

Cultural Surveys Hawai'i Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

Providing Excellence in Cultural Resource Management

O'ahu P.O. Box 1114
Kailua, HI 96734
Ph.: (808) 262-9972
Fax.: (808) 262-4950

Maui 16 S. Market St., #2N
Wailuku, HI 96793
Ph.: (808) 242-9882
Fax.: (808) 244-1994

Kaua'i P.O. Box 498
Lawai, HI 96765
Ph.: (808) 245-4883

Authorization and Release Form

Cultural Surveys Hawai‘i (CSH) is grateful for the generosity of the Kūpuna and Kama‘āina who have willingly shared their knowledge and experiences for the preparation of a cultural impact assessment for the Kolea Reservoir Decommissioning Project, East Maui.

We understand our responsibility in respecting the wishes and concerns of the interviewees participating in our assessment. Here are the procedures we promise to follow:

1. You will have the opportunity to review the written transcription of our interview with you. At that time, you may make any additions, deletions, or corrections you wish.
2. You will be given a copy of the interview transcript you have approved for your records.

For our records and yours, we humbly request your confirmation that:

1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You consent to the interview being made available to the public.

I, Maureen Farineau, agree to the procedures outlined above and by my
(Please print your name)
signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications: #3 only with corrections and deleted items removed. Thank you

Maureen Farineau
(Signature)

6/28/2010
(Date)

Cultural Surveys Hawai'i Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

Providing Excellence in Cultural Resource Management

O'ahu P.O. Box 1114
Kailua, HI 96734
Ph.: (808) 262-9972
Fax.: (808) 262-4950

Maui 16 S. Market St., #2N
Wailuku, HI 96793
Ph.: (808) 242-9882
Fax.: (808) 244-1994

Kaua'i P.O. Box 498
Lawai, HI 96765
Ph.: (808) 245-4883

Authorization and Release Form

Cultural Surveys Hawai‘i (CSH) is grateful for the generosity of the Kūpuna and Kama‘āina who have willingly shared their knowledge and experiences for the preparation of a cultural impact assessment for the Kolea Reservoir Decommissioning Project, East Maui.

We understand our responsibility in respecting the wishes and concerns of the interviewees participating in our assessment. Here are the procedures we promise to follow:

1. You will have the opportunity to review the written transcription of our interview with you. At that time, you may make any additions, deletions, or corrections you wish.
2. You will be given a copy of the interview transcript you have approved for your records.

For our records and yours, we humbly request your confirmation that:

1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You consent to the interview being made available to the public.

I, SHAWN K. TANAKA, agree to the procedures outlined above and by my
(Please print your name)
signature, given my consent and release for this interview to be used for historic documentation and academic purposes.
Additional Comments and Clarifications:

Shawn K. Tanaka
(Signature)

7/6/10
(Date)

Appendix D Land Commission Awards (Waihona ‘Aina Corporation 2000)

LCA 03715B Kekuahani

Claim Number:	**03715B**		
Claimant:	**Kekuahani**		
Other claimant:			
Other name:			
Island:	**Maui**		
District:	**Koolau**		
Ahupuaa:	**Haiku**		
Ili:	**Keopuka, Loiloa**		
Apana:	**3**	Awarded:	**1**
Loi:		FR:	
Plus:		NR:	
Mala Taro:		FT:	**39v15**
Kula:		NT:	
House lot:		RP:	**7518**
Kihapai/Pakanu:		Number of Royal Patents:	**1**
Salt lands:		Koele/Poalima:	**No**
Wauke:		Loko:	**No**
Olona:		Lokoia:	**No**
Noni:		Fishing Rights:	**No**
Hala:		Sea/Shore/Dunes:	**No**
Sweet Potatoes:		Auwai/Ditch:	**No**
Irish Potatoes:		Other Edifice:	**No**
Bananas:		Spring/Well:	**No**
Breadfruit:		Pigpen:	**No**
Coconut:		Road/Path:	**Yes**
Coffee:		Burial/Graveyard:	**No**
Oranges:		Wall/Fence:	**No**
Bitter Melon/Gourd:		Stream/Muliwai/River:	**No**
Sugar Cane:		Pali:	**Yes**
Tobacco:		Disease:	**No**

Koa/Kou Trees:		Claimant Died:	**No**
Other Plants:		Other Trees:	
Other Mammals:	**No**	Miscellaneous:	**government road**

No. 5250D, Kekuahani
F.T. 125v8

The claimant, sworn, that he had written the claim and have sent it to the Land Commission.

Inihia, sworn, The claimants land are of two pieces.

No. 1 is kalo and kula land in the Ahupuaa of Keopuka & Loiloa.
No. 2 is kula land in the Ahlupuaa of Keopuka & Loiloa.

The claimant received these lands from Ikoa, Konohiki for Loiloa in the year 1839. His title has never been disputed.

No. 1 is bounded:
Mauka by Aupuni
Koolau by pali of Keopuka
Makai by sea shore and Liloa
Wailuku by Keopuka Aina.

No. 2 is bounded:
Mauka and all sides by Aupuni.

N.T. 6v7
No. 3715B, Kekuahani, July 18 1849

Inihia, sworn,

Section 1 - Taro pasture in Keopuka.
Section 2 - Taro pasture in Loiloa.
Section 3 - Olona pasture in Loiloa.

Land from Ikoa in 1839.

Section 1:
Mauka by Government road
Hana by Keopuka pali
Makai by Liloa/Keopuka pali
Wailuku by Ke.

Section 2 - Surrounded by government boundaries.

[Award 3715B; R.P.7518; Loiloa Haiku Koolau; 2 ap.; .48 Ac.; See No. 5250D for F.T. document; 5250D not awarded]

LCA 03957 B Keuoho, Luka

Number: 03957B

Claim Number:	**03957B**		
Claimant:	**Keuoho, Luka**		
Other claimant:	Kenoha		
Other name:			
Island:	**Maui**		
District:	**Koolau**		
Ahupuaa:	**Makaiwa, Kolea, Moolua, Punaluu**		
Ili:	**Punaluu**		
Apana:	**5**	Awarded:	**1**
Loi:		FR:	
Plus:		NR:	
Mala Taro:		FT:	
Kula:		NT:	**439v5**
House lot:		RP:	**4109**
Kihapai/Pakanu:	2	Number of Royal Patents:	**1**
Salt lands:		Koele/Poalima:	**No**
Wauke:		Loko:	**No**
Olona:		Lokoia:	**No**
Noni:		Fishing Rights:	**No**
Hala:		Sea/Shore/Dunes:	**No**
Sweet Potatoes:		Auwai/Ditch:	**No**
Irish Potatoes:		Other Edifice:	**No**
Bananas:		Spring/Well:	**No**
Breadfruit:		Pigpen:	**No**
Coconut:		Road/Path:	**No**
Coffee:		Burial/Graveyard:	**No**
Oranges:		Wall/Fence:	**No**
Bitter Melon/Gourd:		Stream/Muliwai/River:	**No**
Sugar Cane:		Pali:	**No**
Tobacco:		Disease:	**No**
Koa/Kou Trees:		Claimant Died:	**No**
Other Plants:		Other Trees:	
Other Mammals:	**No**	Miscellaneous:	

No. 3957B, Luka or Kenoha, See K, July 2, 1849
N.T. 439v5

Kalama, sworn, He has seen Luka's land Makaiwa in Koloa of Koolau land it is an old land from Kauluha before 1819.

Section 1:
Mauka by Waonahele
Hana by Kekua's land
Makai by pali
Hamakua by Nawaihi's land.

Section 2 Kihapai in Punaluu.
Mauka by Ku
Hana and Makai by pali
Hamakua by stream.

Section 3 Kihapai in Kolea.
Mauka by Pahupu's land

Hana and Makai by pali
Hamakua by Pahupu's land.

No one has objected to him.

[Award 3957B; R.P. 4109; Kolea Koolau; 2 ap.; .91 Ac.; Makaiwa Koolau; 1 ap.; 13 Acs; Moloa Koolau; 1 ap.; .19 Ac.; Punalau Koolau; 1 ap.; .88 Ac; Punaluu Koolau; 3 ap.; 1.36 Acs]

Appendix E CSH Scoping Letter

CULTURAL SURVEYS HAWAI'I
ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL DOCUMENTATION SERVICES - SINCE 1982

O'ahu Island
P.O. Box 1114
Kailua, Hawai'i 96734
Ph: (808) 262-9972
Fax: (808) 262-4950

Maui Island
1993 Main Street
Wailuku, Hawai'i 96793
Ph: (808) 242-9882
Fax: (808) 244-1994

Branch Offices:
Hilo, Hawai'i
Kona, Hawai'i
Lāwai, Kaua'i

CSH Job Code: Makaiwa 2

March 22, 2010

Subject: Cultural Impact Assessment Community Contact Letter for the Kolea Reservoir Decommissioning Project, Kolea Ahupua'a, Hāna District, Maui Island, TMK (2) 1-1-001:050

Dear Recipient:

At the request of Oceanit Laboratories, Inc., Cultural Surveys Hawai'i, Inc. (CSH) is conducting a Cultural Impact Assessment (CIA) for the proposed Kolea Reservoir Decommissioning Project, located in Kolea Ahupua'a, Hāna District, Maui Island, TMK (2) 1-1-001:050. An archaeological inventory survey of the project site is also being conducted by CSH along with the CIA. The Kolea Reservoir is located along Kolea Stream at the 800-foot contour and approximately 1.15 kilometers from the coastline (Figures 1 & 2).

The purpose of this project is to decommission the dam at Kolea Reservoir. East Maui Irrigation Co., Ltd. currently owns and operates the reservoir and associated dam that was originally built in 1901. With funding from the State of Hawai'i, the plan is to remove a portion of the existing embankment in order to make the dam non-functional. The amount of flow to Kolea Stream will remain unchanged. The area in and around the reservoir that will be affected is approximately 4 acres. For the CIA portion of this project, the entire Kolea Ahupua'a will be researched.

The purpose of the CIA is to evaluate potential impacts to traditional cultural practices as a result of the proposed project.

We are seeking your *kōkua* or help and guidance regarding the following aspects of our study:

- **General history and present and past land use of the project area.**
- **Knowledge of cultural resources which may be impacted by the Kolea Reservoir Decommissioning Project - for example, traditional plant gathering sites, historic sites, archaeological sites, and burials.**
- **Knowledge of traditional gathering practices in the area – both past and ongoing.**

WWW.CULTURALSURVEYS.COM - INFO@CULTURALSURVEYS.COM

- **Cultural associations of the project area, such as legends and traditional uses.**
- **Referrals of *kūpuna* or elders who might be willing to share their cultural knowledge of the project area and the surrounding *ahupua`a* lands.**
- **Any other cultural concerns the community might have related to Hawaiian cultural practices within the Kolea Ahupua'a and/or in the vicinity of the proposed Kolea Reservoir Decommissioning Project area.**

We invite you to contact us, Anna Cordova and/or Colleen Medeiros Dagan, at 1-808-242-9882. You may also contact us by e-mail at acordova@culturalsurveys.com and cdagan@culturalsurveys.com if you have any information you would like to share.

Mahalo,

Anna Cordova, Archaeologist
Colleen Medeiros Dagan, Archaeologist

Cultural Impact Assessment Community Contact Letter for the Kolea Reservoir Decommissioning Project, Kolea Ahupua'a, Hāna District, Maui Island, TMK (2) 1-1-001:050

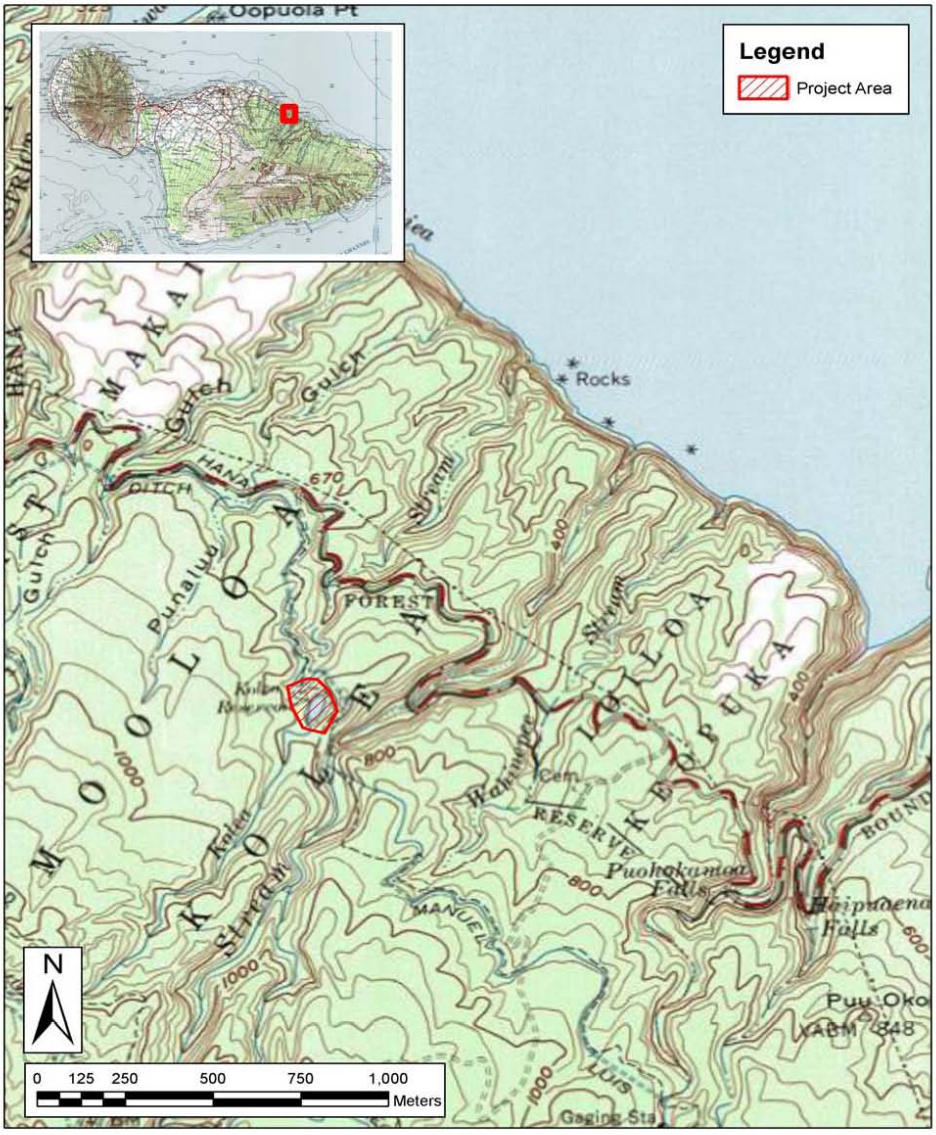


Figure 1. Topographic map with project site indicated by the red cross-hatched area

Cultural Impact Assessment Community Contact Letter for the Kolea Reservoir Decommissioning Project, Kolea Ahupua‘a, Hāna District, Maui Island, TMK (2) 1-1-001:050

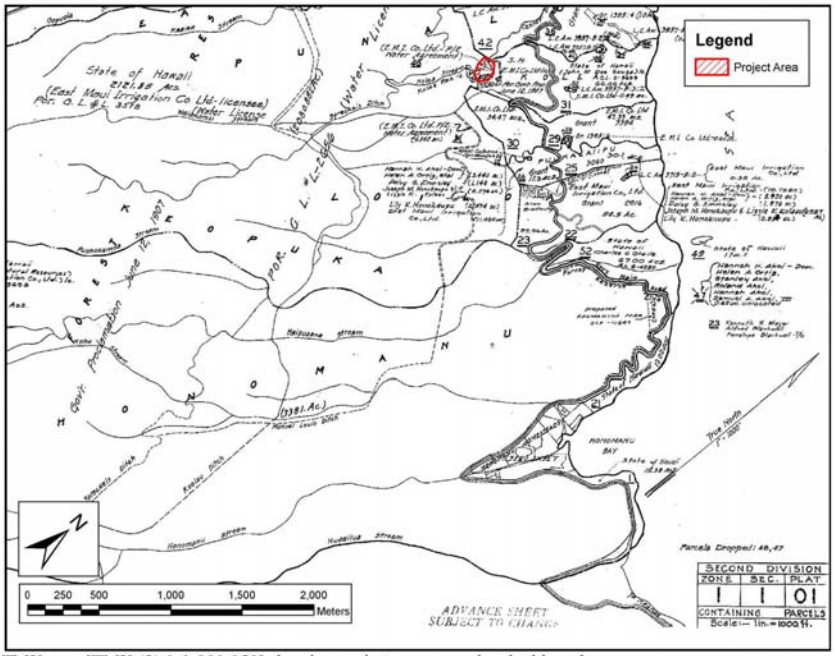


Figure 2. TMK map [TMK (2) 1-1-001:050] showing project area cross-hatched in red.

Cultural Impact Assessment Community Contact Letter for the Kolea Reservoir Decommissioning Project, Kolea Ahupua‘a, Hāna District, Maui Island, TMK (2) 1-1-001:050

APPENDIX B

State Historic Preservation Letter

July 2010

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

July 27, 2010

Hallett H. Hammatt, Ph.D.
Cultural Surveys Hawai'i, Inc.
PO Box 1114
Kailua, Hawaii 96734

LOG NO: 2010.1975
DOC NO: 1007MD27
Archaeology

Dear Dr. Hammatt:

SUBJECT: Chapter 6E-8 Historic Preservation Review –
Archaeological Inventory Survey of Four Acres with One New Site
Kolea Ahupua'a, Hāna District, Island of Maui
TMK: (2) 1-1-001:050 (por.)

This letter reviews the aforementioned report (McCurdy and Hammatt March 2010*; Archaeological Inventory Survey Report for the Kolea Reservoir Decommissioning Project, Kolea Ahupua`a, Hana District, Maui Island, TMK: [2] 1-1-001:050; CSH Job Code: MAKAIWA 1*), which we received on May 10, 2010. We apologize for the delay in our reply.

The project area of the survey encompasses the Kolea Dam, newly recorded as SIHP 50-50-13-6683, a Plantation-era reservoir that was hand-constructed in 1910. It is being decommissioned as a water storage facility at this location because it is no longer needed.

This was the first reservoir built following the annexation of Hawaii by the United States in 1898. It has been recommended significant under criteria "a" (association with a period of great change in Hawaii followed by an influx of immigrant contract labors due to the water availability for improved crop yields); "c" (for its distinctive style and hand-built construction); and "d" for information important to the understanding of water diversion techniques and structures employed during the early plantation period on Maui. We concur with these recommendations. We also agree that the next step is to begin an architectural inventory survey in consultation with our Architecture Branch.

This report is approved as final pursuant to HAR §13-276. Upon receipt of this letter please submit one paper copy of your plan marked "Final" to our Kapolei office along with a CD containing a searchable pdf version of the final report and a copy of this approval letter, marked to the attention of the "**Kapolei Library.**" If you have questions about this letter please contact Morgan Davis at (808) 896-0514 or via email to: morgan.e.davis@hawaii.gov.

Aloha,

Theresa K. Donham
Acting Archaeology Branch Chief
State Historic Preservation Division

APPENDIX C

Architectural Survey

ARCHITECTURAL INVENTORY SURVEY (AIS) CHECKLIST

1. **HISTORIC NAME OF PROPERTY:** Kolea Reservoir

2. **LOCATION/ADDRESS:** vicinity of Hana, Maui
3. **TMK NUMBER:** (2) 1-1-001:050 (portion)

4. **PROPERTY OWNER:** State of Hawaii (fee owner), A&B Properties/ East Maui Irrigation [EMI] Co Ltd (lessee)

5. **APPLICABLE NATIONAL REGISTER CRITERIA (check one or more qualifying criteria):**

☑ **Criterion A**-- Property is associated with events that have made a significant contribution to the broad patterns of our history.

Criterion B—Property is associated with the lives of persons significant in our past.

☑ **Criterion C**—Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

Criterion D—Property has yielded or is likely to yield, information important in prehistory or history.

or Criteria Considerations: (circle one or more) A B C D E F G

6. **INTEGRITY: Does the property retain its historic integrity? Check applicable aspects of integrity retained.**

☑ **Location** ☑ **Design** ☑ **Setting** ☑ **Materials** ☑ **Workmanship** ☑ **Feeling** ☑ **Association**

7. **NR ELIGIBILITY: Is the property eligible for listing on the National Register of Historic Places?**

Yes ☑ **No** ☐ **If "No", then why?** _____

8. **MASON ARCHITECTS, INC. PROPOSED RECOMMENDATIONS/MITIGATION MEASURES:**

File a copy of the Architectural Inventory Survey of March 2010 with the Hawaii State Historic Preservation Division.

ARCHITECTURAL INVENTORY SURVEY REPORT

to determine the significance of a property potentially eligible for nomination to the National Register of Historic Places

SHPD Doc Number: _____
TMK: (2) 1-1-001:050 (portion of)

1. Name of Property

Historic name Kolea Reservoir

Other names/site number _____

2. Location

Street & Number Located on Kolea Stream about 1/3 mile mauka of Highway 360 ☐ not for publication
in Kolea ahupuaa, Maui

City or Town Hana X vicinity

State Hawai'i **Code** HI **County** Maui **Code** 009 **Zip code** 96713

3. Property Owner

Name State of Hawaii (Fee Owner) A & B Properties/ East Maui Irrigation [EMI] Co., Ltd. (Lessee)

Street & Number (EMI) P.O. Box 791628 **Telephone** (808) 579-9516

City or Town Paia **State** Hawaii **Zip code** 96779

4. Geographical Data

Acreage of Property The Kolea Reservoir, dam, and spillway occupy about 2.3 acres within the total 2121.85 acres of TMK (2)1-1-001:050.

Verbal Boundary Description (describe the boundaries of the property)

UTM references (NAD 83) to enclose the 2.3 acres, beginning from the northeasterly point and continuing clockwise are:

1	04.792450.2310590	3	04.792350.2310490	5	04.792340.2310580	7	04.792420.2310640
2	04.792400.2310470	4	04.792370.2310560	6	04.792350.2310680		

This inventory includes all the lands within the above UTM points for the reservoir, dam, spillway and associated features.

Boundary Justification (explain why the boundaries were selected)

This is the property associated with the Kolea Reservoir since its construction in 1901.

5. Form Prepared By

Name/Title Dee Ruzicka, Architectural Historian

Organization Mason Architects, Inc. **Date** February 26, 2010

Street & Number 119 Merchant St., #501 **Telephone** 808-536-0556

City or Town Honolulu **State** Hawai'i **Zip Code** 96813

E-mail dr@masonarch.com

6. Classification

Ownership of Property
(Check as many boxes as apply)

X	private
	public - Local
X	public - State
	public - Federal

Category of Property
(Check only **one** box)

	building(s)
	district
	site
X	structure
	object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
----	----	buildings
----	----	sites
----	----	structures
----	----	objects
----	----	**Total**

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing)

n/a

Number of contributing resources previously listed in the National Register

None

7. Function or Use

Historic Functions
(Enter categories from instructions)

agriculture/ irrigation facility

Current Functions
(Enter categories from instructions)

agriculture/ irrigation facility

8. Description

Architectural Classification
(Enter categories from instructions)

other – reservoir w/ earth dam & spillway

Materials
(Enter categories from instructions)

Foundation: earth
Walls: n/a
Roof: n/a
Other:

Narrative Description and Integrity Assessment

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with **a summary paragraph** that briefly describes the reason this report was requested and the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

The March 14, 2006 failure of the Kaloko dam on Kauai raised concerns in Hawaii about the safety of its numerous earth embankment dams, most of which date from the plantation era. In April 2006 the U.S. Army Corps of Engineers undertook an

emergency safety inspection of the dam at Kolea Reservoir to determine if the dam and reservoir were "suspect for immediate concern to the downstream area under the prolonged conditions of heavy rain showers."[1] Although this inspection found that there was no immediate threat to the safety of the dam, it was later determined that because the reservoir has little current economic value, its abandonment would be the best course of action.

It is proposed by the (property owner) State of Hawaii and (lessee) East Maui Irrigation Co. Ltd., to decommission the Kolea Reservoir by removing most of the earth embankment dam, the catwalk, and the outlet works. The spillway would likely remain intact. To mitigate any effects the proposed removal of the Kolea Reservoir's dam will have upon this historic property, the present inventory survey was undertaken and documentation prepared. The following description derives from a visit to the site on February 23, 2010. The reservoir lies within the boundaries of the Koolau Forest Reserve.

Narrative Description

The waters of the Kolea Reservoir are retained by an earthen embankment dam which impounds the Kolea Stream. Other features associated with the reservoir and dam are a primary outlet valve, a catwalk from the embankment to access the primary outlet valve, a secondary outlet valve, a spillway, and a diversion structure below the dam that supplies the Center Ditch with water from the reservoir. The earth embankment dam is about 200' long and 48' high with a 35' wide crest carrying an unsurfaced roadway. At least a portion of the dam is faced with rubble boulders on its upstream slope. The long axis of the dam is oriented north northeast to south southwest with the waters of the reservoir to the east and south. The reservoir basin is about 475' long and 150' across at its widest point. On the site visit for this report the reservoir was almost completely drained, with a pool of water about 90' wide and an indicated 23'-6" depth at the primary outlet catwalk.

The inlet to the reservoir is the natural course of Kolea Stream, feeding the reservoir at its southwest end. The inlet stream courses over natural boulders in the stream bed, but as it enters the reservoir, the mud bottom of the reservoir encroaches over the boulders as the reservoir widens. The minimal flow into the reservoir from Kolea Stream seems to match the flow out of the reservoir through the outlet valve(s). At the time of the field visit, the water level in the reservoir appeared to have been unchanged for at least several days. Survey marking tape was present in the reservoir basin, at the water line and at various points around the site. The mud lining of the reservoir was somewhat moist, either from recent rain or from a recent draining of the reservoir contents.

The earth embankment dam at Kolea Reservoir has at least a section of its upstream slope faced with stacked rip rap boulders. This section of visible rip rap is flanked by areas of silt and mud which have either accumulated on top of the rip rap facing or else form the slope where no rip rap has been applied. The actual composition of the upstream slope beneath the silt and mud flanking the rip rap was not possible to ascertain during the field work. This visible rip rap section is in the form of a "v" centered just south of the primary oulet catwalk. The lower portion of the v-shape is about 10' wide at the water level and widens to about 100' at the top of the dam embankment.

At the south end of this visible rip rap section is the south abutment of the dam. Here an area of natural rock projects slightly into the bowl of the reservoir, and just south of this is the spillway for the reservoir. The spillway is a channel cut into the rock. The floor of the spillway channel is about 10' below the top of the dam embankment. The channel is about 20' wide at its inlet. When the water level is at the level of the spillway, the reservoir contains between 31 and 34 acre/ feet of water.[2] A section of the north side wall of the spillway extending about 35' from the inlet is lined with stacked boulders. The spillway channel extends west, gradually narrowing and flowing into a natural narrow gully in the rock about 130' from the spillway inlet. This gully is about 5' to 7' wide and drops sharply before widening onto more gently sloping rock ledge that turns northward and joins the flow from the outlet valves before running over a bouldered stream bed to the diversion structure for the Center Ditch.

The primary outlet valve handwheel is accessed by a wood catwalk from the top of the dam embankment above the north portion of the rip rap sectionof the upstream slope. This catwalk is formed of two vertical wood poles supporting two 36' long horizontal poles that extend out from the top of the dam. The vertical wood poles of the catwalk are braced with horizontal boards placed about every 5'. The horizontal poles taper from 14" in diameter at their bases and are spaced about 5' apart. Transverse 4" x 4" timbers span the horizontal poles and support the metal grate catwalk deck. 4" x 4" balusters and 2" x 4" rails make up the handrails at the sides of the catwalk. The handwheel for the primary outlet valve is at the end of the catwalk. It is about 2' in diameter and fixed to the top of the vertically oriented valve shaft. The valve shaft extends down to the outlet valve below the surface of the water. Along the visible length of the shaft (above where it

[1] U.S. Army Corps of Engineers, "Limited Visual Dam Safety Inspection Summary Report MA-097, Kolea Reservoir Maui, Hawaii," State of Hawaii, DLNR, 2006, 1.
[2] Ibid., "Field Inspection Sheets 1 of 10"

dissappears below the water) it is braced at three points by horizontal boards supported by knee braces which form support structures. The lowermost of these three braces is just below the present surface of the water.

The remains of staff gauge numerals at 1' increments are found on the north vertical wood pole. The highest numeral, 43, corresponds to a point level with the uppermost support structure for the vertical shaft of the outlet valve. This is at a point about 7' below the catwalk deck. At the time of the field survey the catwalk deck was about 27' above the surface of the water. The water level was between 23' and 24' on the staff gauge.

The handwheel for the secondary outlet valve is located on the upslope face of the dam, about 10' north of the catwalk, just a few feet below the crest in a small level area. This handwheel is 20" in diameter, fixed to the top of a vertical 3" diameter shaft that extends down below the earth of the dam in a 4½" diameter metal sleeve that is set in a 20" square concrete slab.

The observable portion of the Kolea Reservoir outlet works consists of an approximately 36" diameter corrugated metal culvert extending into the earth toe of the dam on the downstream side embankment opposite the two inlet valves. A small amount of water was flowing out from the outlet culvert pipe into a narrow rock-strewn channel that conveys it a short distance to the Kolea Stream bed. The downslope embankment of the dam could not be observed during the fieldwork due to the thick vegetation on its surface.

Downstream from the reservoir the outlet flow and the spillway bed converge about 80' from the center of the dam. This flow then encounters a diversion structure which feeds the water into the Center Ditch and also has the capacity to divert water downstream into the Kolea Stream bed. This diversion structure is constructed of cast concrete and uncoursed rubble with concrete mortar joints. It consists of a mixing pool (about 15' x 25') which receives incoming water from the Center Ditch and the flow from the Kolea Reservoir outlet. This pool has walls lined of uncoursed rubble with concrete mortar joints and has a natural bottom of variable depth which slopes gradually from the upstream end to about 6' deep at its downstream end. The downstream end of the pool is defined by a wide rubble and concrete mortar wall (dam) across the streambed, with a level top surface paved with uncoursed rubble and a battered downstream slope. This wide rubble wall (dam) separates the mixing pool from the Kolea Stream bed below it. The outlet through this wall (dam) which, when open allows water to flow out of the pool into the Kolea Stream bed, is a rectangular opening about 2'-6" wide and 4' high on the downslope side of the wall (dam). The outlet flow through this wall (dam) is controlled by a vertically sliding gate valve that is submerged in the mixing pool. This valve is operated by a hand lever set on a small cast concrete support structure built on the top surface of the wide wall (dam).

The inflow from Center Ditch enters the mixing pool from the east. The west side of the pool is defined by a rubble and concrete mortar wall, about 4' wide and 4' high that extends south about 30' from the wall (dam) at the downstream end of the mixing pool. This 4' wide wall separates the mixing pool (on its eastern side) from the continuation of the Center Ditch, on its western side. At the south end of this 4' wide wall a narrow concrete wall (about 10" wide) extends further south onto the bed of Kolea Stream as it flows down from the reservoir. At the bottom of this concrete wall, where the sloping bottom of the mixing pool has a shallow depth of about 1'-6", there are two 12" diameter pipes which allow water to flow out of the mixing pool. The water flowing through these pipes passes out of the mixing pool, through the 10" wide wall, and into the continuation of Center Ditch which flows northward separated from the mixing pool by the 4' wide rubble wall. After the water flows about 35' there is a small weir in Center Ditch to maintain a head of water at the two 12" diameter through-pipes and in the mixing pool. At this weir the Center Ditch is formed of cast concrete sides and bottom. A seepage of water from a source on the west side of the mixing pool is carried by a cast concrete chute over the continuation of the Center Ditch and the 4' wide wall into the mixing pool. The open-top chute is about 2'-6" high and 3' wide with walls about 4" thick.

Assessment of Integrity
(Indicate whether the property has historic integrity in terms of location, setting, design, materials, workmanship, feeling, and association)

The location of the Kolea Reservoir and associated features is original and it has not been moved. The location of the reservoir relates to the topography of the basin and its suitability for use as a reservoir. The location also seems to relate closely to the Center Ditch, extant at the time of the reservoir's construction, which received the outlet flow and transferred it to the Lowrie Ditch and hence to cane fields further west. Integrity of location has been retained.

The setting of the reservoir remains much as it was when it was constructed; the character of the environment remains as it was when the reservoir played its historical role. The surrounding area is still forested and the reservoir is located the same distance above the main road. The access road up to the reservoir has likely been widened during the years since its construction, but its character has not been changed. Integrity of setting has been retained.

The design of the reservoir and its associated features is original. The dam's slopes and earth and riprap construction as well as the spillway cut into the rock are indicative of design choices made during the planning and construction of the reservoir. Also the diversion structiure at the Center Ditch shows strong evidence of the design used to incorporate the reservoir water into the irrigation system. Integrity of design has been retained.

The key materials of the reservoir, dam, and associated features all date from the period of significance. The earth and stone features of dam, spillway, and diversion structure are original. Some metal portions of the diversion structure outlet valve have been replaced. Although the wood catwalk of the primary outlet valve at the reservoir is not original, it appears historic. Integrity of materials is largely retained.

The workmanship of the Kolea Reservoir and its primary associated features is historic. The earth and rip rap of the dam and the carved spillway display the construction methods at the time it was built. Likewise, the stone and concrete work of the diversion structure supplies vivid evidence of the labor and skill involved. Some items such as the wood catwalk express later, although still probably historic, techniques. Integrity of workmanship is largely retained.

The aspect of feeling invoked by the Kolea Reservoir has the capacity to express the sense of its historic period. Although it is currently drained, the physical qualities of the reservoir and associated features properly convey its historic character. Integrity of feeling is retained.

The aspect of association is evident in the Kolea Reservoir because it is a site important to the irrigation history of sugar cane on Maui and it is sufficiently intact to convey that relationship to an observer. Integrity of association is retained.

In summary, the Kolea Reservoir still retains integrity of location, setting, design, feeling, and association. Integrity aspects of materials and workmanship are decreased. However, all aspects of integrity are still present in amounts ample for the property to retain the identity for which it is significant and to allow listing in the National Register.

9. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing)

- [X] A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] B Property is associated with the lives of persons significant in our past.
- [X] C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] D Property has yielded, or is likely to yield, information important in prehistory or history.

Areas of Significance
(Enter categories from NR instructions)

agriculture
engineering

Period of Significance

1901 – 1960

Significant Dates

1901

Criteria Considerations
(Mark "x" in all the boxes that apply)

Property is:

- [ ] A owned by a religious institution or used for religious purposes.
- [ ] B removed from its original location.
- [ ] C a birthplace or grave.
- [ ] D a cemetery.
- [ ] E a reconstructed building, object, or structure.
- [ ] F a commemorative property.
- [ ] G less than 50 years old or achieving significance within the past 50 years.

Significant Person
(Complete only if Criterion B is marked above)

Cultural Affiliation

Architect/Builder

unknown

Period of Significance (justification)

The period of significance begins with the 1901 construction of the dam and reservoir. Their contribution to the irrigation of Maui's sugarcane fields continued through the 20th century. By the 1920s EMI was diverting an average of 160 mgd (million gallons/ day) and was capable of 445 mgd. During the era of sugarcane production on Maui, EMI controlled the water rights to a large portion of the East Maui watershed. A large number of Hawaii's extant earth fill dams were built by the plantations before 1940. The period of significance closes at 1960. The Kolea Reservoir is not considered to possess the exceptional importance required under Criterion Consideration G for properties that have achieved significance within the past 50 years.

Statement of Significance Summary Paragraph (provide a summary paragraph that includes level of signficance—local, state, or national, and applicable criteria)

The Kolea Reservoir has state and local significance under National Register Criterion A for its association with the development of the sugar industry in Hawaii and on Maui.

The Kolea Reservoir is also significant under National Register Criterion C as a good example of a small earth fill dam and reservoir constructed in Hawaii during the late 19th century and early 20th century.

Narrative Statement of Significance

Criterion A:
Because sugar cane needs a large amount of water throughout its entire two year growing cycle, the development of the sugar industry on Maui was tied to the construction of ditches and reservoirs to route and collect water from the wet upland areas and deliver it to the cultivated lands on the lower arid plains. Throughout the Hawaiian Islands, plantation owners built ditch and reservoir systems to irrigate cane fields and also provide water for fluming cut cane out of the fields, washing and processing sugar, hydroelectric power, and occasionally for domestic use. As rain was the source of water for the ditches, fluctuations in the supply of water in the ditches were frequent. The reservoirs helped to ameliorate this by stockpiling water during wet times so that it could be released into the ditch when needed. Hawaiian annexation continued the sugar reciprocity policy between Hawaii and the U.S. Sugar reciprocity was dependant upon the Hawaiian government's support of the industry, including water development to boost production. A key component of water development for the sugar industry was the apportionment of water rights, including permission for the plantations to transport water out of the watershed onto the cane fields.[3]

Hawaii had an extensively developed irrigation system during the first half of the 20th cenntury. "By 1920 the sugar industry had invested $11 million in the development of surface water"[4] and was diverting an average of 800 million gallons per day. Fifty-five percent of the 250,000 acre sugar crop was irrigated. In 1934, lands planted in sugar cane in Hawaii had been invested at the rate of $304 per acre to cover both surface and ground water irrigation. This was over three times the investment per cultivated acre for the next highest capitalized state ($99/ acre, Arizona) in 1940.

The 1901[5] Kolea Reservoir was constructed by the Hamakua Ditch Company, a firm that was begun in 1876 by Alexander & Baldwin (A&B) founders Samuel Alexander and Henry Baldwin. In 1908 the Hamakua Ditch Company was succeeded by the East Maui Irrigation Company (EMI), which was formed to manage and develop surface water for all A&B sugar plantations. Hamakua Ditch Co. (EMI) was the first private water company established in Hawaii. Water companies became an important vehicle for the plantations to secure water use, negotiate with competing water interests, consolidate the management of ditch systems, and also to attract investment. Virtually all surface water collection systems in Hawaii were developed by private water companies or plantations.[6] Althought ground water from wells was available in many sugar cane growing areas, the cost of fuel for the pumps in the early days of sugar cultivation made it uneconomical. Dropping fuel prices and plantations developing their own power supplies lowered the cost of pumped water, but the development of surface water accounted for much of the cane grown in the early days of the plantations.

The Kolea Reservoir was built to augment the second large ditch irrigation project undertaken on Maui by Hamakua Ditch Co., the Lowrie Ditch.

Early A&B Irrigation Ditch Systems in East Maui
The Hamakua Ditch Company's first large ditch irrigation project, the Hamakua Ditch, was completed in 1878. This ditch (not to be confused with 1904-1910 Upper and Lower Hamakua Ditches on the Big Island) brought water from upland Hamakua, Maui to reservoirs above the sugar cane fields north of Kihei. The second large ditch irrigation project for the Hamakua Ditch Co. was the Lowrie Ditch. This was implemented to carry water that was collected from areas down slope of the earlier Hamakua Ditch. When it was finished in September 1900, the Lowrie Ditch extended 22 miles from Papaaea west and south to a reservoir about 3 miles northeast of Kihei.

---

[3] Wilcox,Carol, *Sugar Water, Hawaii's Plantation Ditches*, (Honolulu: University of Hawaii Press), 1996, 16.
[4] Wilcox, *Sugar Water*, 20
[5] Hawaii Dept. of Land and Natural Resources, Water and Land Development Division, "Dams Within the Jurisdiction of the State of Hawaii, Circular C122, 1992, 143.
[6] Wilcox, *Sugar Water*, 18.

The Kolea Reservoir and the Center Ditch System

When the Kolea Reservoir was built it contributed to the Lowrie Ditch by augmenting the flow the ditch carried to the sugar cane fields. By impounding the waters of the Kolea Stream during rainy times the reservoir was able to maintain a supply of water flowing into the Lowrie Ditch during the dryier periods. Just below the Kolea Reservior dam, a diversion bled water into the Center Ditch, a short ditch extending about 1 ½ miles that carried Kolea Reservoir water into the Lowrie Ditch at a point just below the Papaea Reservoir. Also contributing to the flow of the Center Ditch was the Manuel Luis Ditch which collected water from the Punalua Stream about 1 ½ miles east of the Kolea Reservoir and fed it into the Center Ditch just below the Kolea Reservoir. This gave the Lowrie Ditch two sources, the Papaaea Reservoir and the Center Ditch/ Kolea Reservoir/ Manuel Luis Ditch system. Although the combined length of these two ditches (Center Ditch and Manuel Luis Ditch) was about 2 ½ miles, because of the contours of the terrain they were forced to follow, their useable length was about double that distance.

After the Kolea Reservoir was built, EMI added numerous other ditches to its complex water management system, which enabled the further expansion of sugar cane production. Although EMI also developed water collection tunnels which tapped the water in aquifers, the main source of water was surface runoff (streams) like that impounded by the Kolea Reservoir. EMI eventually controlled the surface watershed of 56,000 acres in east Maui, owning 18,000 acres and leasing the rest from the state.[7] By the 1990s the Lowrie/ Center/ Manuel Luis Ditch system, with water contributed by the Kolea Reservoir, was one of four parallel levels of ditches operated by EMI which extended across the north slope of the East Maui Mountains. Of the four, the Lowrie and the Wailoa systems flow at all times, with the New Hamakua and New Haiku systems operating to take on any surplus or for times when the fields need extra delivery.[8] By this time the state leases to watershed rights that EMI previously held had expired and the company operated using year-to-year revocable permits issued by the state.[9]

Criterion C:

The Kolea Reservoir is significant as a good example of a small earth fill dam-impounded reservoir constructed in Hawaii during the late 19th century and very early 20th century, before established engineering practices began to dictate the designs of earth fill dams. Built to contain stream water for sugar cane irrigation and other plantation purposes, the reservoir is typical of its period in its use of materials, method of construction, craftsmanship, and design.

The dam itself is a good example of a small earth fill dam in Hawaii, the most common type of dam in Hawaii and accounting for more than 95% of dams in Hawaii. In Maui County there were 35 earth fill dams built by 1927. The earliest dated from 1885, with most (13) constructed during 1917.[10] One of their principal advantages is that their construction utilizes natural earth which can have great cost advantages over the extensive use of manufactured materials,. The foundation requirements for earth fill dams are also less strict than for concrete dams. The Kolea Reservoir dates from the period when earth fill dams were built using empirical methods without relying on scientific engineering principles. In 1899, just before the Kolea Reservoir dam was built, an important treatise on dam engineering, Edward Wegmann's *Design and Construction of Dams*, was first published. By 1907 additional early engineering studies suggested that the slopes of earth filled dams be determined by the application of engineering principles rather than the previous trial and error methods.[11]

The Kolea Reservoir dam has major deviations from dam design parameters that were understood but still to be recognized by vernacular dam builders at the turn of the 20th century. Its upstream slope of 1:1[12] and crest width of 35' is in contradiction to Wegmann's contemporary recommendations of upstream embankment slopes of 2:1 to 3:1(horizontal:vertical) with a maximum width of 30 feet if the top of the dam is to be used for a roadway.[13]

Earth fill dams are typically most vulnerable to destruction by overtopping during times of heavy rain due to inadequete spillway capacity. They must also be protected from erosion by spillway outlets placed too near their toe.

[7] Wilcox, *Sugar Water*, 118.
[8] Wilcox, *Sugar Water*, 121.
[9] Ibid.
[10] Hawaii DLNR, Dams Within Jurisdiction of the State of Hawaii.
[11] Arthur, H.G., "Earthfill Dams," in U.S. Dept. of the Interior, Bureau of Reclamation, *Design of Small Dams*, (Washington D.C.: Government Printing Office), 1977, 205.
[12] U.S. Army Corps of Engineers, "Limited Visual Dam Safety," 4, 5.
[13] Wegmann, Edward, *Design and Construction of Dams*, (New York: John Wiley & Sons), 1918, 223.

10. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets)

Arthur, H.G., "Earthfill Dams," in U.S. Dept. of the Interior, Bureau of Reclamation, *Design of Small Dams*, (Washington D.C.: Government Printing Office), 1977.

Godbey, Robert Carson, *Report of the Independent Civil Investigation of the March 14, 2006 Breach of Ka Loko Dam*, Honolulu: State Department of the Attorney General, January 2007.

Hirata, Ernest K. & Associates, *Report R88: Guidelines for the Design and Construction of Small Embankment Dams*, Honolulu: Department of Land and Natural Resources, June 1992.

Schuyler, James Dix, *Recent Developments in Hydraulic Dam Construction*, New York: John Wiley & Sons, 1907.

Schuyler, James Dix, *Reservoirs for Irrigation, Water-Power and Domestic Water Supply*, (New York: John Wiley & Sons, 1909.)

Smith, Norman, *A History of Dams*, Secaucus, N.J.: Citadel Press, 1972.

State of Hawaii, Department of Land and Natural Resources, *Circular C122: DAMS Within the Jurisdiction of the State of Hawaii*, Honolulu: DLNR, April 1992.

United States Department of the Interior, Bureau of Reclamation, *Design of Small Dams*, Washington D.C., United States Printing Office, 1977.

Wegmann, Edward, *Design and Construction of Dams*, New York: John Wiley & Sons. 1918.

Wiltshire, Richard Lyman. "100 Years of Embankment Dam Design and Construction in the U.S. Bureau of Reclamation," paper presented at Bureau of Reclamation History Symposium, Las Vegas, Nevada, June 18-19, 2002 <www.usbr.gov/history/Symposium_June2002/Reclamation%20(D)/PDF'S/Wiltshire,%20Richard%20L.pdf>

U.S. Army Corps of Engineers and State of Hawaii Department of Land and Natural Resources, *Limited Visual Dam Safety Inspection Summary Report, MA-097, Kolea Reservoir, Maui, Hawaii*, Honolulu: U.S. Army Corps of Engineers and State Department of Land and Natural Resources, May, 2006.

Previous documentation on file (NPS):

____preliminary determination of individual listing (36 CFR 67 has been requested
____previously listed in the National Register
____previously determined eligible by the National Register
____designated a National Historic Landmark
____recorded by Historic American Buildings Survey #_____
____recorded by Historic American Engineering Record #_____

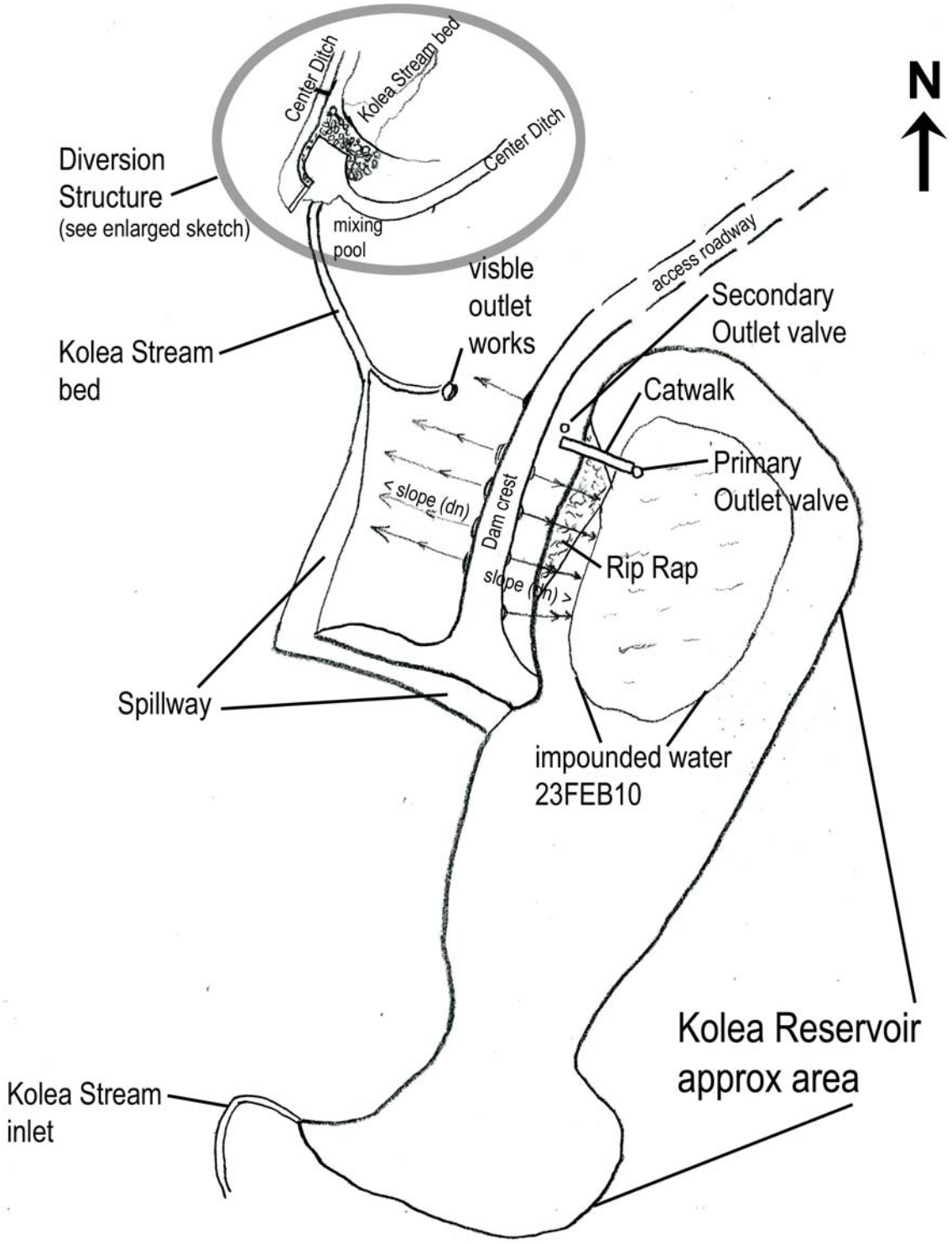
Primary location of additional data:

____State Historic Preservation Office
____Other State agency
____Federal agency
____Local government
____University
____Other
Name of repository: _____

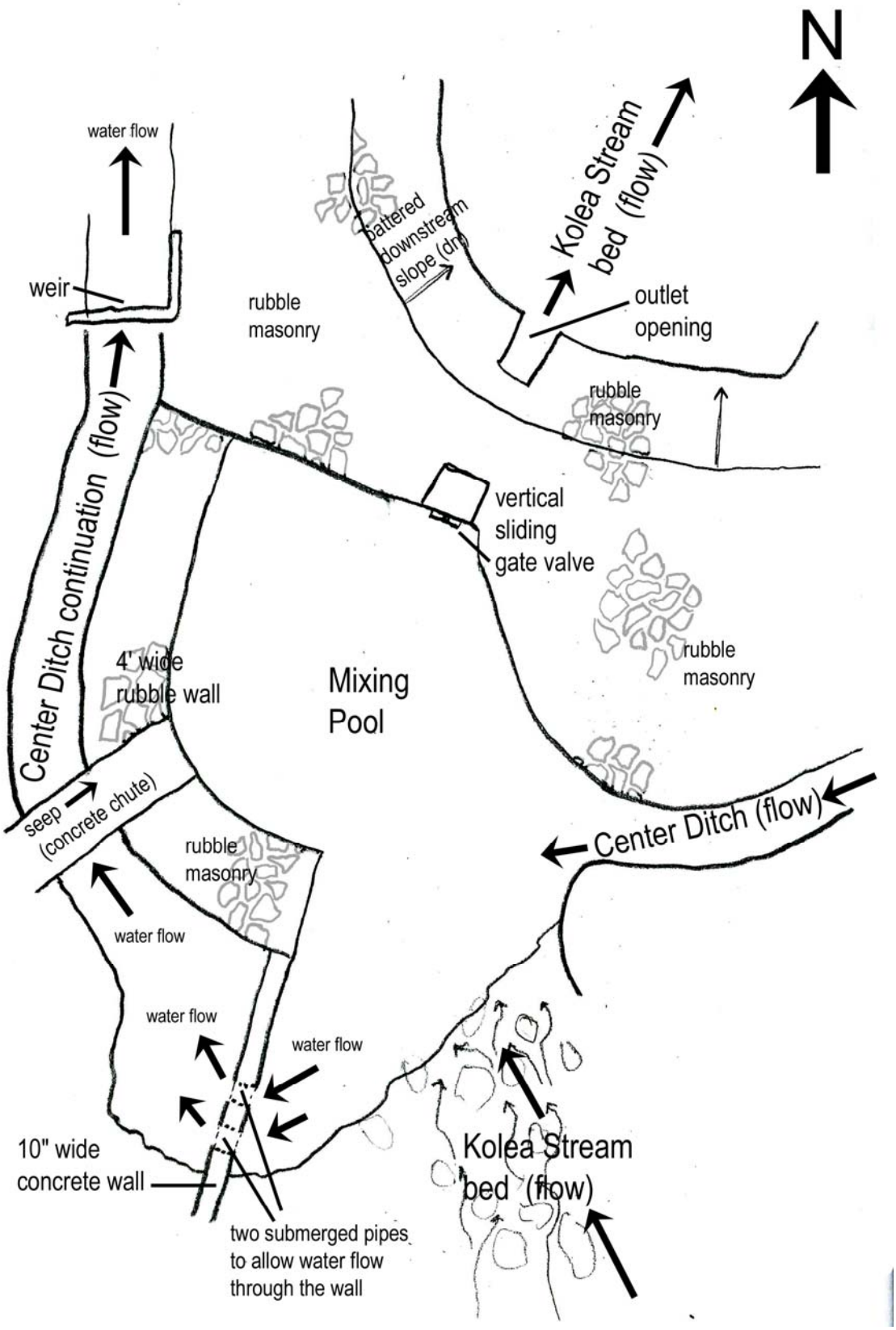
Historic Resources Survey Number (if assigned): _____

11. Photographs and Sketch Map

Sketch map showing the features of the Kolea Reservoir. Not to scale.



Enlarged sketch map of diversion structure below Kolea Reservoir. Not to scale.



Name of Property: Kolea Reservoir
City or Vicinity: Hana, Maui
County: Maui **State:** Hawaii
Photographer: Dee Ruzicka, Mason Architects, Inc.
Photographed: February 23, 2010. See the photo key map (following the photos) for photo locations & orientation.

Photograph 1. HI_ Maui County_Kolea Reservoir_1. View of the catwalk and the impounded water in Kolea Reservoir. View facing south.

Photograph 2. HI_ Maui County_Kolea Reservoir_2. Catwalk and upstream slope of the dam showiing the rip rap section. View facing north.

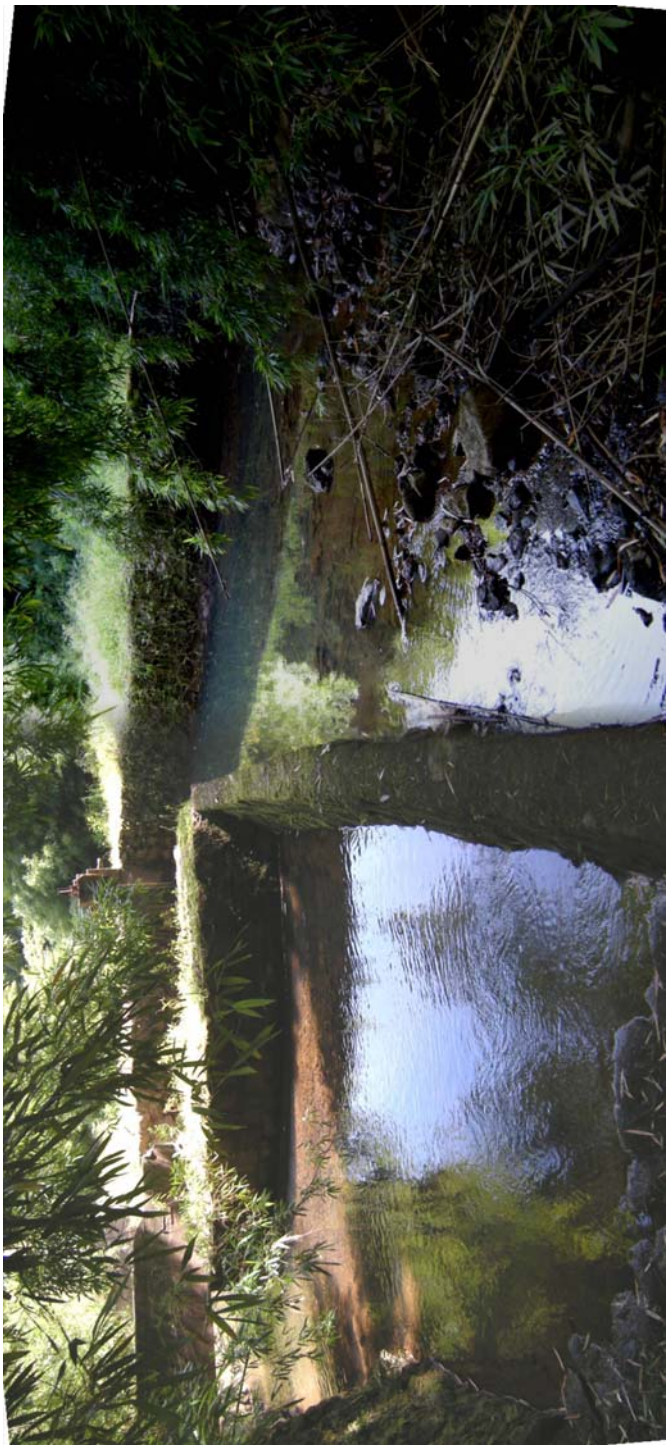
Photograph 3. HI_ Maui County_Kolea Reservoir_3. Catwalk and upstream dam embankment showing the rep rap section. Note the outlet valve shaft extending down just to the right of the vertical pole supports of the catwalk. View facing south.

Photograph 4. HI_ Maui County_Kolea Reservoir_4. The crest of the Kolea Dam. The vehicle is parked adjacent to the catwalk. View facing northeast.

Photograph 5. HI_ Maui County_Kolea Reservoir_5. Spillway cut into the rock at the south abutment of the dam, with the spillway inlet in the background. Note the narrow natural gully at the lower right. The basin of the reservoir is in the background, the dam extends to the left View facing southeast.

Photograph 6. HI_ Maui County_Kolea Reservoir_6. Down stream slope of the dam. Note the vehicle parked adjacent to the catwalk. View facing northeast.

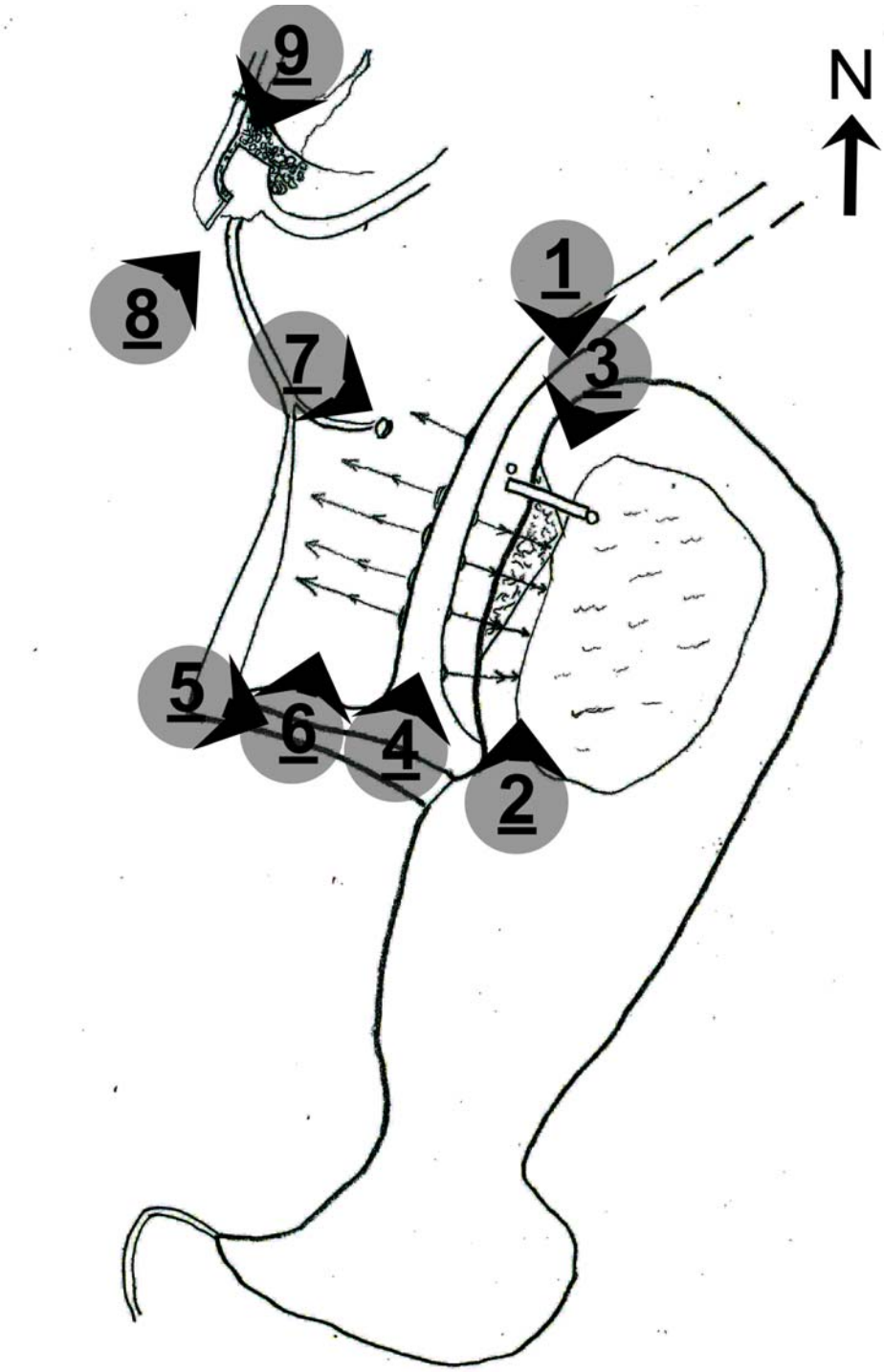
Photograph 7. HI_ Maui County_Kolea Reservoir_7. Detail view of the visible portion of the outlet works at the downstream toe of the dam. View facing southeast.



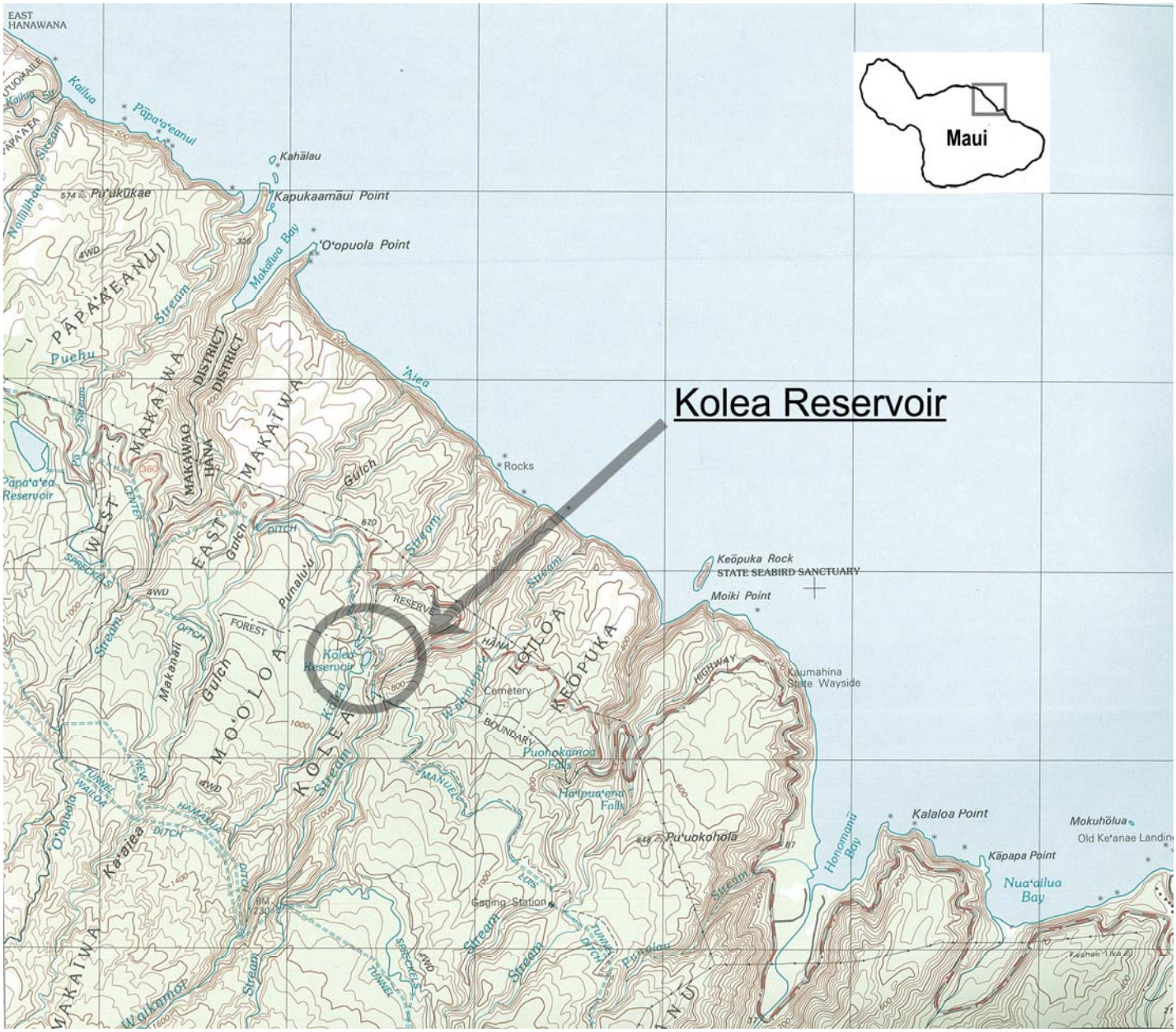
Photograph 8. HI_ Maui County_Kolea Reservoir_8. View of the diversion structure below the Kolea Reservoir looking downstream. The Center Ditch inlet is on the right. In the right foreground is the rocky bed of the Kolea Stream with the flow from the reservoir outlet and spillway entering the mixing pool. The 10" wide concrete wall extends up from the (off camera) foreground. The continuation of the Center Ditch is on the left side of the 10" wide wall. View facing northeast.

Photograph 9. HI_ Maui County_Kolea Reservoir_9. Diversion structure looking upstream. The mixing pool is in the upper center of the photo with the 4' wide wall and continuation of the Center Ditch on the right. Note the wide wall (dam) extending up to the left that impounds the mixing pool. The rectangular outlet works can be seen on the downstream side of the wide wall (dam). The Kolea Stream bed below the diversion structure extends to the left of the photo. View facing southwest.

Photo Key map showing the orientation of the above photos. Not to scale.



Location map for Kolea Reservoir on Maui. North at top.



APPENDIX D

Biological Survey

AECOS No. 1228

Biological surveys for the Kōlea Reservoir dam removal project, East Maui

Prepared by:

AECOS Inc.
45-939 Kamehameha Hwy, Suite 104
Kāneʻohe, Hawaiʻi 96744-3221

June 15, 2010

Biological surveys for the Kōlea Reservoir dam removal project, East Maui

June 15, 2010 *AECOS* No. 1228

Eric Guinther, Reginald David[1], and Chad Linebaugh
AECOS, Inc.
45-939 Kamehameha Hwy, Suite 104
Kāne'ohe , Hawai'i 96744
Phone: (808) 234-7770 Fax: (808) 234-7775 Email: aecos@aecos.com

Introduction

In April 2010, *AECOS*, Inc. biologists conducted biological surveys on and around Kōlea Stream in the vicinity of Kōlea Reservoir on windward east Maui (Fig. 1). *AECOS*, Inc. was contracted by Oceanit Laboratories Inc.[2] to investigate aquatic and forest environments for the proposed decommissioning of the Kōlea Reservoir dam. The primary purpose of the surveys was to determine if any biological resources of interest or concern, and particularly if any species currently listed as threatened, endangered, or proposed for listing under either the federal or state endangered species programs, occur on or within the immediate vicinity of Kōlea Dam, and assess whether biological resources might be impacted by removal of the dam. This report details findings of those surveys.

Stream Description

Kōlea Stream (state perennial stream ID number 6-4-03) arises as a perennial stream around the 1200-ft (366-m) elevation on East Maui Mountain, flowing northeast to the shore roughly midway between Maka'iwa Bay and Honomanu Bay. The stream is shown on USGS topographic maps as perennial only down to Kōlea Reservoir, and intermittently flowing below the reservoir. A short distance downstream of the dam, stream water is taken off by the Manuel Luis Ditch (or Center Ditch), which also intercepts flow from nearby Waikamoi Stream at the 680-ft (210-m) elevation. The Kōlea watershed is only 121 ac (49

[1] Rana Biological Consulting, Inc., Kailua-Kona, Hawai'i.

[2] This document will be incorporated into the Environmental Assessment (EA) for the Kōlea Dam Removal Project and will become part of the public record.

ha) in area (OSP, 1994), smaller than adjacent Kaʻaiea (676 ac or 274 ha) to the west (much smaller Punaluʻu Gulch lies between) and Waikamoi[3] to the east.

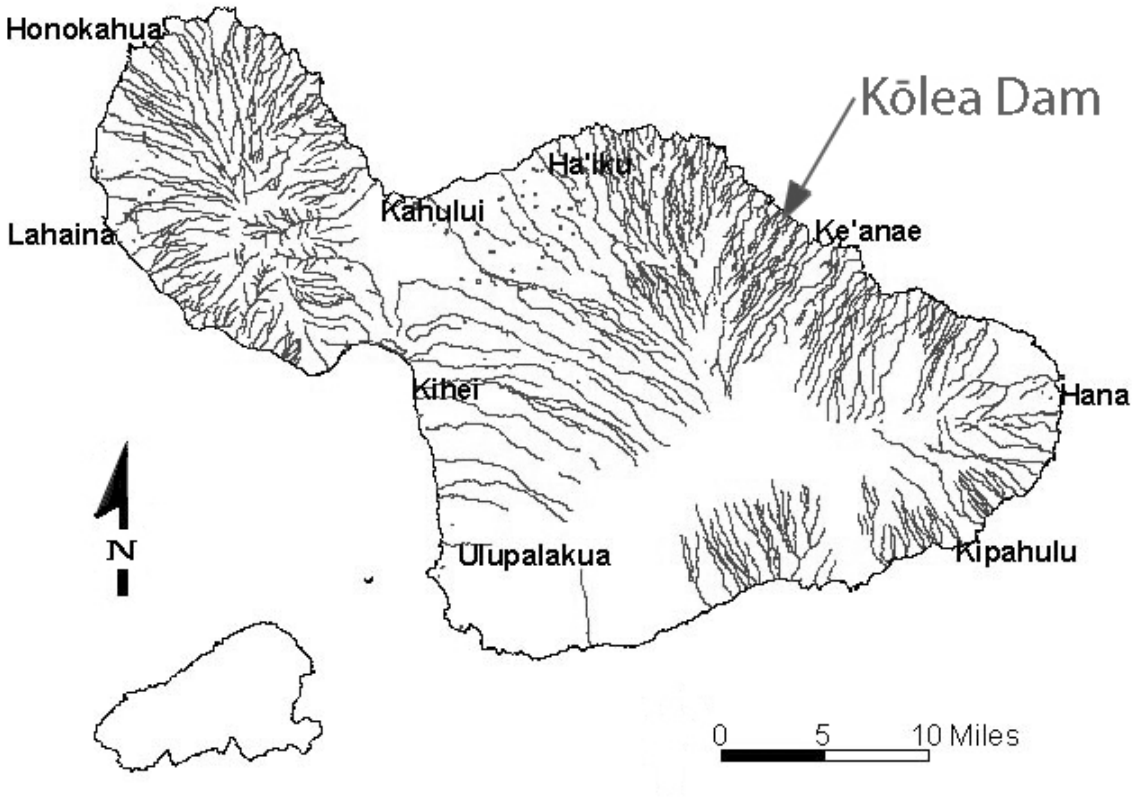


Figure 1. The general location of the project site on a map of Maui streams.

At Kōlea Reservoir and upstream, the stream is confined to a narrow gulch with steep sides. The reservoir itself partly fills this gulch, the steep sides of which make accessing the shore very difficult (Fig. 2). The dam is accessible via an unimproved road at a distance of approximately one-quarter mile (0.4 km) in from (mauka) the Hāna Highway (State Rte. 360).

[3] Inexplicably, the acreage of Waikamoi is given as 448 and 449 ac (OSP, 1994); however, it is clearly many times larger. Waikamoi arises near the top of East Maui Mountain in the vicinity of Puʻu Nianiau and Hosmer Grove on the Haleakala Highway, and is roughly comparable in size to the Pūohokamoa watershed to the east, put at 2000 ac (809 ha) by OSP.

Figure 2. Kōlea Reservoir looking upstream from the north end of the dam.

Survey Methods

Field surveys were conducted by the survey team on April 14, 2010. Weather conditions were generally very good, although stream flow was well above normal.

Botanical Resources

The botanical survey entailed walking throughout the area on unimproved roads and trails and identifying all species of flowering plants encountered. Binoculars were used to identify plants on inaccessible steep slopes along the west side of the reservoir and stream immediately downstream of the spillway. The survey extended to the area where the Manuel Luis Ditch crosses Kōlea

Stream and upstream in the area of the Waikamoi Nature Trail. Plants were identified in the field, or collected for later identification in the laboratory. In some cases, photographs were taken in lieu of collected material.

Aquatic Biota

AECOS, Inc biologists surveyed aquatic biota at several locations in Kōlea Stream, Kōlea Reservoir, and Center (Manuel Luis) Ditch. Surveys were conducted by observing project waters for fishes and invertebrates and netting off stream and reservoir banks with a long-handled dip net (0.25 in or 6 mm mesh). Survey locations included all points along the stream and reservoir where the biologist could safely access the waterway. High stream flow generated by rainfall in the area the previous night precluded entry into the water and limited sampling locations to six in Kōlea Stream: three locations along the stream upstream of the reservoir, in the reservoir spillway, the intersection of Kōlea Stream and Center Ditch, and the stream at the Hāna Highway Bridge.

Kōlea Reservoir was surveyed from six locations along the shore: below the pier extending out from the dam, near the spillway, near the center of the eastern shoreline, two locations along the southern shoreline, and close to where Kōlea Stream enters the reservoir. Steep side slopes, brisk water flow, and dense vegetation prevented access to many parts of the reservoir. Turbid brown waters during the survey precluded surveying the reservoir with mask and snorkel or observing animals in the water from the shore. A 700-ft (210-m) segment of Center Ditch extending north from Kōlea Stream was also briefly surveyed using the dip nets.

Terrestrial Vertebrates

Two avian count stations were sited at either end of the dam. Eight-minute point counts were made at each of the count stations. Each station was counted once. A visual inspection was also made of the dam, surrounding area and Kōlea Stream, a running tally was kept of all avian species detected while within the general project area. Additionally two 30-minute time-dependant waterbird counts were made at the dam, and the outfall area, located immediately below the dam. Field observations were made with the aid of Leica 10 X 42 binoculars and by listening for vocalizations. Additionally, the zoologist walked the project area in a similar fashion as the botanist, to ensure that no additional bird species or habitats not encountered during the time dependant avian counts were present on the site.

All observations of mammalian species were of an incidental nature. With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or *ʻōpeʻapeʻa* as it is known locally, all terrestrial mammals currently found on the Island of Maui are alien species, and most are ubiquitous. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all vertebrate species observed and heard while the biologists were within the project area.

Miscellaneous

Avian phylogenetic order and nomenclature follows *The American Ornithologists' Union Check-list of North American Birds 7th Edition* (American Ornithologists' Union 1998), and the 42nd through the 50th supplements to *Check-list of North American Birds* (American Ornithologists' Union 2000; Banks et al., 2002, 2003, 2004, 2005, 2006, 2007, 2008; Chesser et al., 2009). Mammal scientific names follow *Mammals in Hawaii* (Tomich, 1986). Flowering native and naturalized plant names follow *Manual of the Flowering Plants of Hawaiʻi* (Wagner et al., and Wagner and Herbst, 1990, 1999). Fern names are from *Hawai`i's ferns and fern allies* (Palmer, 2003). Names of ornamentals follow *A Tropical Garden Flora* (Staples and Hervbst, 2005). Place names follow *Place Names of Hawaii* (Pukui et al*.,* 1974). Hawaiian and scientific names are italicized in the text. A glossary of technical terms and acronyms used in the document is included at the end of the narrative text.

Federal and State of Hawaiʻi listed species status follows species identified in the following referenced documents: Division of Land and Natural Resources (DLNR), 1998; U. S. Fish & Wildlife Service (USFWS), 2005a, b, 2009a, 2010).

Survey Results

Botanical Survey

Although a variety of plants occur around and in the vicinity of Kōlea Dam, the landscape is dominated by the highly invasive subspecies of black bamboo known as Henon bamboo (*Phyllostachys nigra henionia*). The extensive, dense stands of this rapidly spreading plant eventually come to dominate to the exclusion of nearly all other species of higher plants (Wagner et al., 1990; Staples and Herbst, 2005). A typical population of Henon bamboo, spreading by underground stems alone (no seed is produced), consists of fairly evenly spaced, vertical stems called culms. With the exception of scattered large trees

that were likely present before the bamboo spread into the area, few if any other plant species exist within these stands (Fig. 3). When these older trees eventually die, they are not replaced, and only the bamboo remains. Were it not for the roads and trails through the area, surveying for biota would have been extremely difficult. Although Henon bamboo stands are fairly easily penetrated because of the relatively even spacing of the culms, once inside a stand, finding other plants becomes a dubious exercise. Not only are other plants very rare, but sight distances are short. Road cuts, the Kōlea dam, stream and ditch areas, and a park-like ridge area associated with the Waikamoi Nature Trail were the only pieces of ground supporting the 80 other species of ferns, conifers, and flowering plants recorded during the survey (Table 1). Of course there remains many areas not distant from Kōlea Reservoir that have not been invaded by Henon bamboo. But in the immediate area of the reservoir, particularly to the north, east, and south, cover by bamboo is nearly complete and the species appears to be slowly expanding (Fig. 3).

Table 1. Checklist of plants found in areas of around Kōlea Dam and vicinity, East Maui, Hawai'i.

Species	Common name	STATUS	ABUNDANCE	NOTES
PTERIDOPHYTES ~ FERNS & FERN ALLIES				
ATHYRIACEAE				
Deparia petersenii (Kunze) M. Kato	---	Nat	R2	<2>
BLECHNACEAE				
Blechnum appendiculatum Willd.	---	Nat	U2	<2>
DICKSONIACEAE				
Cibotium chamissoi Kaulf.	*hāpu'u*	**End**	R	
Cibotium menziesii Hook.	*hāpu'u i'i*	**End**	R	
GLEICHENIACEAE				
Dicranopteris linearis (Burm. f.) Underw.	*uluhe*	**Ind**	U3	
LINDSAEACEAE				
Sphenomeris chinensis (L.) Maxon	*pala'ā*	**Ind**	U	<2>
LYCOPODIACEAE				
Lycopodiella cernua (L.) Pic. Serm.	*wāwae'iole*	**Ind**	R	<2>
NEPHROLEPIDACEAE				
Nephrolepis multiflora (Roxb.) F.M. Jarrett ex C.V. Morton	sword fern	Nat	R	

Table 1 (continued).

Species	Common name	STATUS	ABUNDANCE	NOTES
POLYPODIACEAE				
Phlebodium aureum (L.) J. Sm.	rabbit's-foot fern	Nat	R	
Phymatosorus grossus (Langsd. & Fisch.) Brownlie	*laua'e*	Nat	U	<1>
PSILOTACEAE				
Psilotum nudum (L.) P. Beauv.	*moa*	**Ind**	R	
THELYPTERIDACEAE				
Christella dentata (Forssk.) Brownsey & Jermy	wood fern	Nat	O	
Christella parasitica (L.) H. Lév.	wood fern	Nat	U	
GYMNOSPERMS				
CONIFERS				
CUPRESSACEAE				
Platycladus orientalis (L.) Franco	Oriental arborvitae	Orn	--	
FLOWERING PLANTS				
DICOTYLEDONS				
AMARANTHACEAE				
Alternanthera sessilis (L.) DC	sessile joyweed	Nat	R	
APIACEAE				
Centella asiatica (L.) Urb.	Asiatic pennywort	Nat	U	
ASTERACEAE (COMPOSITAE)				
Ageratum conyzoides L.	*maile hohono*	Nat	C	<1>
Bidens pilosa L.	*kī,*	Nat	U	<1>
Eclipta prostrata (L.) L.	false daisy	Nat	R	
Elephantopus mollis Kunth	elephant's foot	Nat	--	
Emilia fosbergii Nicolson	Flora's paintbrush	Nat	--	
Erechtites valerianifolia (Wolf) DC	---	Nat	U	<1>
Spagneticola trilobata (L.) Pruski	wedelia	Nat	--	
Synedrella nodiflora (L.) Gaertn.	nodeweed	Nat	--	
Youngia japonica (L.) DC	Oriental hawksbeard	Nat	C	
BEGONIACEAE				
Begonia hirtella Link	---	Nat	U	<1>
BIGNONIACEAE				
Spathodea campanulata P. Beauv.	African tulip tree	Nat	U	<1>
BRASSICACEAE				
Nasturtium sarmentosum (G. Forster ex DC) Schinz & Guillaumin)	*pā'ihi*	**Pol**?	R	<3>
BUDDLEIACEAE				
Buddleia asiatica Lour.	dogtail	Nat	R	

Table 1 (continued).

Species	Common name	STATUS	ABUNDANCE	NOTES
EUPHORBIACEAE				
Aleurites moluccana (L.) Wild.	*kukui*	**Pol**	U	
FABACEAE				
Acacia confusa Merr.	Formosan *koa*	Nat	R	
Chamaecrista nictitans (L.) Moench	partridge pea	Nat	U	
Falcataria moluccana (Miq.) Barneby & Grimes	albizia	Nat	R	<1>
Mimosa pudica L.	sensitive plant	Nat	O	<1>
MALVACEAE				
Hibiscus tiliaceus L.	*hau*	**Ind**	U	
Sida rhombifiolia L.	---	Nat	C	<1>
MELASTOMATACEAE				
Clidemia hirta (L.) D. Don var. hirta	Koster's curse	Nat	C	<1>
Tibouchina herbacea (DC) Cogn.	glorybush	Nat	U	<1>
MORACEAE				
Ficus platypoda (Miquel) Miquel	---	Nat	R	
MYRSINACEAE				
Ardisia elliptica Thunb.	shoe-button ardisia	Nat	A	
MYRTACEAE				
Eucalyptus robusta Sm.	swamp mahogany	Nat	--	
Melaleuca quinquenervia (Cav.) S.T. Blake	paperbark	Nat	C	
Psidium cattleianum Sabine	strawberry guava	Nat	U	
Psidium guajava L.	common guava	Nat	O2	<1>
OLEACEAE				
Fraxinus uhdei (Wenzig) Lingelsh.	tropical ash	Nat	--	
ONAGRACAE				
Ludwigia octovalvis (Jacq.) Raven	primrose willow	Nat	U	
OXALIDACEAE				
Oxalis debilis var. *corymbosa* (A.P. de Candolle) Lour.	pink wood sorrel	Orn	U	<3>
PLANTAGINACEAE				
Plantago major L.	common plantain	Nat	U	
POLYGALACEAE				
Polygala paniculata L.	bubblegum plant	Nat	C	
ROSACEAE				
Rubus rosifolius Sm.	thimbleberry	Nat	U	<3>
SCROPHULARIACEAE				
Castilleja arvensis Cham. & Schlechtend.	Indian paintbrush	Nat	U	<1>

Table 1 (continued).

Species	Common name	STATUS	ABUNDANCE	NOTES
URTICACEAE				
Pilea microphylla (L.) Liebm.	artillery plant	Nat	R1	
VERBENACEAE				
Verbena littoralis Kunth	*ōwī*	Nat	R	
MONOCOTYLEDONES				
AGAVACEAE				
Dracaena marginata Lam.	money tree	Orn	--	
ARACEAE				
Epipremnum pinnatum 'Aureum' G.S. Bunting	pothos	Nat	--	
Monstera delicosa Liebmann	monster	Orn	--	
Syngonium cf. *podophyllum* Schott	nephthytis	Nat	--	
Xanthosoma robustum Schott	'ape	Nat	R	
ARECACEAE				
Dypsis lutescens (H. Wendl.) Beentje & Dransfield	golden-fruited palm	Orn	R	
BROMELIACEAE				
Ananas comosus L.	pineapple	Orn	--	
COMMELINACEAE				
Commelina diffusa N.L. Burm.	day flower	Nat	C	<1>
COSTACEAE				
Costus sp.	spiral flag	Orn	--	<3>
CYPERACEAE				
Cyperus halpan L.	---	Nat	C	<1>
Cyperus polystachyos Rottb.	---	**Ind**	U	<1>
Fimbristylis dichotoma (L.) Vahl	---	**Ind**	R	
Kyllinga brevifolia Rottb.	*kili'o'opu*	Nat	O	
PANDANACEAE				
Pandanus tectorius Z	*hala*	**Ind**	--	
POACEAE (GRAMINEAE)				
Axonopus fisifolius (Raddi) Kuhlm.	carpetgrass	Nat	C3	
Coix lachryma-jobi L.	Job's tears	Nat	U	<1>
Digitaria violascens Link	smooth crabgrass	Nat	O	<1>
Digitaria setigera Roth	*kūkaepua'a*	**Ind**?	R2	
Echinochloa colona (L.) Link	jungle-rice	Nat	R	
Panicum repens L.	torpedo grass	Nat	O3	<3>
Pennisetum purpureum Schumach.	elephant grass	Nat	R	<3>
Paspalum dilatatum Poir.	Dallis grass	Nat	O	

Table 1 (continued).

Species	Common name	STATUS	ABUNDANCE	NOTES
POACEAE (continued)				
Phyllostachys nigra henionia (Mitford) Rendle	Henon bamboo	Nat	AA	<1>
Sacciolepis indica (L.) Chase	Glenwood grass	Nat	A	<1>
Setaria palmifolia (J. König) Stapf	palm grass	Nat	U	
Urochloa mutica (Forssk.) Nguyen	California grass	Nat	R	<1>
ZINGERBERACEAE				
Alpinia purpurata (Viell.) K. Schum.	red ginger	Orn	--	
Hedychium sp.	ginger	Nat	U	<3>

Legend to Table 1

Status = distributional status

End = endemic; native to Hawaii and found naturally nowhere else.

Ind = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.

Nat = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.

Orn = exotic, ornamental or cultivated; plant not naturalized (not well-established outside of cultivation).

Pol = Polynesian introduction before 1778.

Abundance = occurrence ratings for plants in survey area.

R – Rare - only one, two, or three plants seen.

U - Uncommon - several to a dozen plants observed.

O - Occasional - found regularly around the site.

C - Common - considered an important part of the vegetation and observed numerous times.

A - Abundant - found in large numbers; may be locally dominant.

AA - Abundant - abundant and dominant in some areas surveyed, defining vegetation in those areas.

-- - Indicates species observed in the area, but not near the dam project.

Notes:

<1> Observed growing on the dam structure.

<2> Plant associated with wet cliff faces (most are road cuts).

<3> Plant lacking seasonal flowers or fruit; identification uncertain.

As noted, the vegetation aside from the bamboo, consist mainly of remnants of a secondary growth forest, and weedy growth along unimproved roads and on the dam. A few steep slopes (such as the south side of the spillway opposite from the dam; Fig. 4) and cuts support *uluhe* fern (*Dicranopteris linearis*), along with several other fern species (including Hawaiian tree fern), representing remnants of the original, native vegetation in this area. The face of the dam was

Figure 3. Typical, steep margin of Kōlea Reservoir, dominated by Henon bamboo. Note dead tree in bamboo stand; ferns and Koster's curse grow here on the bank below the bamboo.

heavily invaded by Henon bamboo, but this was recently cut down to accomodate engineering surveys of the structure. Although shoe-button ardisia (*Ardisia elliptica*) is listed as abundant in the survey results, it is abundant only in areas lacking or only weakly invaded by bamboo. The same is generally true for the other abundant and common species listed in Table 1. Most of the species occur along the unimproved road, which extends to the top of the ridge overlooking Waikamoi Stream. Others are associated with the dam, stream, or ditch. The Waikamoi Ridge Trail runs along this ridge where a rest pavilion and ornamental plantings are found. This trail is not to be confused with The Nature Conservancy's Waikamoi Preserve (TNC, 2010) on the upper slopes of East Maui Mountain off the Haleakala Highway and located far upslope of the Kōlea Dam project.

Figure 4. Looking across Kōlea Reservoir at spillway with dam to the right. Steep gulch margin on left is mostly covered with native *uluhe* fern.

The total number of flowering plants and ferns listed for the project area (Table 1, excluding species observed in the general area) is 66. Of these 66 species,

two (3.0%) are endemics (uniquely native to the Hawaiian Islands), 8 (12.1%) are indigenous (native to the Hawaiian Islands and elsewhere), and two (3.0%) are Polynesian introductions made before 1778 ("canoe plant"). These percentages are fairly typical of disturbed forests in Hawai'i.

Aquatic Biota

Only a few species of aquatic invertebrate and insect were observed during the April 14, 2010 survey (Table 2). The day mosquito (*Aedes albopictus*) was common throughout the survey area. The scarlet skimmer (*Crocothemis servilia*) was rare, seen flying among the vegetation and around the pier on the dam. The American crayfish (*Procambarus clarkii*) was observed in the reservoir, especially at the south end (stream inflow area). No fishes were observed at any location within the survey area (stream, reservoir or ditch). No fishes or invertebrates were observed in the surveyed short segment of Munuel Luis Ditch below Kōlea Reservoir. A single damselfly was seen, but so briefly it could not be identified.

Table 2. List of aquatic species observed in Kōlea Stream and Kōlea Reservoir during the April 14, 2010 survey.

PHYLUM, CLASS, ORDER, FAMILY *Genus species*	Common name	Abundance	Status	Location
INVERTEBRATES				
ARTHROPODA, INSECTA, DIPTERA				
CULICIDAE				
Aedes albopictus Skuse	day mosquito	C	Nat	<1,2>
ARTHROPODA, INSECTA, HEMIPTERA				
MESOVELIIDAE				
Mesovelia mulsanti White	water treader	R	Nat	<1>
ARTHROPODA, INSECTA, ODONATA				
unid.	dragonfly	R	--	<1,2>
LIBELLULIDAE				
Crocothemis servilia Drury	scarlet skimmer	R	Nat	<1>

Table 2 (continued)

PHYLUM, CLASS, ORDER, FAMILY *Genus species*	Common name	Abundance	Status	Location
ARTHROPODA, MALACOSTRACA, DECOPODA CAMBARIDAE				
Procambarus clarkii Girard	American crayfish	R	Nat	<1>

KEY TO SYMBOLS USED:
Abundance categories:
R – Rare – only one or two individuals observed.
C – Common -observed everywhere, although generally not in large numbers.
Status categories:
Nat – Naturalized – species introduced to Hawai'i intentionally or accidentally.
Location codes:
<1> – Kōlea reservoir.
<2> – Kōlea stream.

Avian Survey

A total of 26 individual birds representing nine different species and eight separate families were recorded during station counts (Table 3). Eight of the species recorded are considered to be alien to the Hawaiian Islands. One avian species, Hawaii Amakihi (*Hemignathus virens wilsoni*), was detected while transiting between count stations.

Not a single waterbird was detected during the time we were within the project area. No avian species currently listed, or proposed for listing under either federal or State of Hawai'i endangered species statutes was detected during the course of this survey.

Avian diversity and densities were extremely low, though likely in keeping with the dense, almost impenetrable Henon bamboo forest present throughout the project area. Two species—Northern Cardinal (*Cardinalis cardinalis*) and Japanese White-eye (*Zosterops japonicus*)—accounted for slightly more than 46% of the total number of birds recorded during station counts. The most frequently recorded species was Northern Cardinal, which accounted for 27% of the total number of birds recorded during station counts. An average of 13 birds was recorded per station count.

Mammalian Survey

Only one mammalian species was detected during the course of the time spent in the project area. One large rat (*Rattus* sp.) was seen climbing in the Henon bamboo grove to the northwest of the spillway below the dam. No mammalian species currently listed, or proposed for listing under either the federal or State of Hawai'i endangered species statutes was detected during the course of this survey.

Assessment

Botanical Resources

The plants found in the project area and on Kōlea Dam itself are almost exclusively non-native and the vegetation is dominated by invasive bamboo. Although some native species occur here, these are mostly ferns and sedges, limited in distribution to the unimproved roads, steep road cuts, and steep gulch margins. No botanical resources of concern from a conservation standpoint occur in the project area. Remnants of the native forest closest to the dam are limited to the steep gulch margins near the dam spillway (across the spillway from the dam). The side of the gulch in this area is so steep that bamboo has been slow or is unable to invade. These steep slopes will preclude the dam removal project from having much of an impact.

Aquatic Resources

No historical biological data could be found for Kōlea Stream or Kōlea Reservoir. The nearest larger streams: O'opuola to the west and Waikamoi and Pū'ohokamoa further east are not ranked very high by DAR for native stream fauna. Native *'ōpae* (*Atyoida bisulcata*) and *'o'opu* (*Awaous guamensis* and *Lentipes concolor*) are reported from the latter two stream systems (DLNR-DAR, 2008). Native *'ōpae* and *'o'opu* are typically not abundant in or upstream of reservoirs of the Hawaiian Islands due to the presence of introduced predator species like tucanare (*Cichla ocellaris*) and bass (*Micropterus* spp.).

Removal of the earthen embankment dam will return this segment of Kōlea Stream to a more natural state that will favor recruitment of native species. The reservoir may at present not support non-native species because these were not introduced and access from downstream would be difficult. Except at certain times of above average flow, water from the reservoir feeds into Manuel Luis Ditch via a pipe (valve shown in Fig. 2). The spillway overflow might not be

Table 3 - Avian Species Detected During Station Counts, Kōlea Dam Project Area

Common Name	Scientific Name	ST	RA
	GALLIFORMES		
	PHASIANIDAE - Pheasants & Partridges		
	Phasianinae - Pheasants & Allies		
Red Junglefowl	*Gallus gallus*	D	0.50
	COLUMBIFORMES		
	COLUMBIDAE - Pigeons & Doves		
Spotted Dove	*Streptopelia chinensis*	A	0.50
Zebra Dove	*Geopelia striata*	A	1.00
	PASSERIFORMES		
	SYLVIIDAE - Old World Warblers & Gnatcatchers		
	Sylviinae - Old World Warblers		
Japanese Bush-Warbler	*Cettia diphone*	A	1.00
	TIMALIIDAE - Babblers		
Hwamei	*Garrulax canorus*	A	1.50
	ZOSTEROPIDAE - White-eyes		
Japanese White-eye	*Zosterops japonicus*	A	2.50
	CARDINALIDAE - Cardinals Saltators & Allies		
Northern Cardinal	*Cardinalis cardinalis*	A	3.50
	FRINGILLIDAE - Fringilline and Carduleline Finches & Allies		
	Carduelinae - Carduline Finches		
House Finch	*Carpodacus mexicanus*	A	1.50
	Drepanidinae - Hawaiian Honeycreepers		
Hawaii Amakihi	*Hemignathus virens*	ER	I -2
	ESTRILDIDAE - Estrildid Finches		
	Estrildinae - Estrildine Finches		
Common Waxbill	*Estrilda astrild*	A	1.00

Key to Table 2

ST	Status
D	Domesticated – Not considered to be established in the wild on the island of Maui
A	Alien – Introduced to the Hawaiian Islands by humans
ER	Endemic Resident – Native and unique to Maui, resident species
RA	Relative Abundance –Number of birds detected divided by the number of count stations (2)
I	Incidental – A species seen while transiting between count stations, followed by the number recorded

a barrier to native anadromous species, but could be a barrier to upstream migration by most non-native species.

Native Damselflies — It is certainly possible that Kōlea Reservoir and/or the water courses in the area support native (endemic) damselflies of the genus *Megalagrion*. *Megalagrion calliphya* and *M. hawaiiense* have been reported from the upper reaches of Waikamoi Stream (DLNR-DAR, 2008). Presently, two species of *Megalagrion* are proposed for listing as endangered: the Flying Earwig Hawaiian Damselfly (*M. nesiotes*) and Pacific Hawaiian Damselfly (*M. pacificum*; USFWS, 2009b,c). Four species of *Megalagrion* are candidate species (USFWS, 2009c): *M. leptodemus*, *M. nigrohamatum nigrolineatum*, *M. oceanicum*, and *M. xanthomelas*. The first three are Oʻahu endemics, only known from that island. *M. xanthomelas*, the orangeblack Hawaiian damselfly, is locally abundant on Molokaʻi, Lanaʻi, and Hawaiʻi. This species tends to breed in coastal wetlands fed by basal springs or in the lower reaches of perennial streams, although will opportunistically exploit temporary pools bordering flashy streams. Eggs are laid on aquatic vegetation (Polhemus and Asquith, 1996).

Historically, the flying earwig Hawaiian damselfly (*M. nesiotes*) was known from the islands of Hawaiʻi and Maui. The species has not been seen on Hawaiʻi for over 80 years, although extensive surveys within apparently suitable habitat in the Kaʻu and Olaʻa areas were conducted from 1997 to 2008. On Maui, the flying earwig damselfly was historically reported from five general locations on the windward side of the island (Kennedy, 1934). The last observation of the species on Maui was in 2005, despite surveys from 1993 through 2008 at several of its historically occupied sites. The 2005 population was associated with *uluhe* fern on a rocky talus slope (USFWS, 2009b). Not much is known about the breeding biology of *M. nesiotes*; what is known suggests this species breeds in "scattered pockets of water [in the forest] or in the bases [leaf axils] of leaves of tropical plants" (Perkins, related by Kennedy, 1934). Adults appear not to associate with streams, so impacts to this species as a result of removal of Kōlea Dam is unlikely.

The Pacific Hawaiian damselfly (*M. pacificum*) is now believed to be extirpated from the islands of Oʻahu, Kauaʻi, and Lanaʻi (Polhemus and Asquith, 1996). It was believed that the species had been extirpated from the Island of Hawaiʻi when in 1998 a population was discovered within a small stream along the Hamakua Coast (Englund, 1998). *M. pacificum* breeds in seepage fed pools bordering the terminal reaches of perennial streams (Moore and Gagne, 1982; Polhemus and Asquith, 1996). They seem to prefer areas of dense vegetation, and seem not to stray far from breeding pools. This habitat is not present in the project area.

Several other species of Hawaiian damselflies (*M. blackburni*, *M. calliphya*, *M. hawaiiense,* and *M. koelense*) are known from windward East Maui (Polhemus and Asquith, 1996). These species are presently not protected, and are generally upland dwellers found at much higher elevations than Kōlea Reservoir. *M. hawaiiense* is the species most likely to be seen in the project vicinity and is the most frequently encountered native damselfly in Hawai‘i. Juveniles of this species live in "thin sheets of water on wet mossy rocks or dripping banks adjacent to streams…" (Polhemus and Asquith, 1996, p. 55).

Native Stream Fauna — Unfortunately nothing is known about the native species of fishes, crustaceans, and mollusks living in Kōlea Stream. No native and only five (including four insects) non-native aquatic species were observed in April or have been previously reported from this small stream system. Impediments to upstream migration include a steep drop into the ocean at the shore and a low head dam on the stream at the point where the Manual Luis Ditch crosses (essentially at stream elevation) Kōlea Stream (Fig. 5). These impediments would likely limit upstream migration of non-native fishes, but would not pose a barrier to all of the native species, several of which are capable of scaling waterfalls. and only The non-native crayfish (*Procambarus clarkii*) observed in the reservoir is capable of overland migration.

Larger stream systems to the east harbor native aquatic animals as discussed above (for Waikamoi Stream), and these streams are connected to Kōlea Stream by the Manuel Luis Ditch which captures flow from Punalau Stream and outflow from the Kōlea Powerhouse[4]. Thus, lateral connections between these East Maui stream systems exist that likely serve as routes for both native and non-native aquatic fauna. Thus, Kōlea Stream is not isolated from other streams in the area, although access from the ditch up to the reservoir may not be possible for non-native fishes.

With removal of the dam, the ditch diversion (and its low head dam) will remain. This structure is a likely block to upstream migration by non-natives from the highway bridge (where introductions of aquarium species might occur). However, the ditch connects Kōlea Stream with many others along this northern slope, suggesting all of these streams share both native and non-native aquatic fauna. Ideally, removal of the Kōlea Reservoir Dam will leave a stream bed of sufficient steepness to act as a barrier to upstream migration by non-native species. Kōlea is a very short stream compared with most streams on this windward slope of East Maui (DAR size rating: 1 and reach diversity rating: 2; out of 10 possible). The reservoir is located approximately midway between

[4] Another stream with the name, Kōlea, and a long tunnel from Nua‘ailua Stream feed the powerhouse penstock. The outflow is then fed to the Manuel Luis Ditch, with any excess going into intermittent Punalau Stream and Honomanu Bay.

the mouth and the headwater, so gains in native stream fauna habitats will not be substantial from removal of this dam. Modifications to the physiography of the stream channel to create a barrier to upstream migration by non-natives could be justified only if the cost were low.

Figure 5. Kōlea Stream at Manuel Luis Ditch at a time of above normal flow. In this photo, the ditch flows from left to right just beyond the biologist's net. Kōlea Stream flows in from background left and, at high flow, over the approximately 18-ft (6-m) dam in the foreground right. The valve at left allows diversion of water via a pipe to the stream bed downstream of the dam structure.

Avian Resources

All but one of the 10 avian species detected during the course of this survey are considered to be alien to the Hawaiian Islands. The lone native species detected, Hawaii Amakihi was seen away from the dam, one along ridge separating the dam from the Waikomoi Stream gulch and the other adjacent to Kōlea Stream, at the Hāna Highway. The two *'amakihi* recorded are of the endemic Maui sub-species. *'Amakihi* are only one of six extant endemic forest birds with relatively

large populations that, at least in East Maui, are currently thought to be maintaining stable or possibly increasing populations (Gorresen, et. al, 2009).

One species detected, Red Junglefowl (*Gallus gallus*), is currently not considered to be established in the wild on the Island of Maui. Avian diversity was relatively low, though in keeping with the location of the site and the vegetation present within the project are.

Hawaiian Petrel and Newell's Shearwater — Although not detected during this survey, both the endangered Hawaiian Petrel (*Pterodroma sandwichensis*) and the threatened endemic sub-species of the Newell's Shearwater (*Puffinus auricularis newelli*) may over-fly the project area between April and the end of November each year. Both species have been recorded flying to and from their nesting colonies located in the mountains to the west and east of the project site (DOFAW unpublished seabird data 1994-2009; Cooper and Day, 2003, 2004; Day and Cooper, 1999). Both of these pelagic seabird species nest high in the mountains in burrows excavated under thick vegetation, especially *uluhe* fern.

The primary cause of mortality in both Hawaiian Petrels and Newell's Shearwaters is thought to be predation by alien mammalian species at the nesting colonies (USFWS, 1983; Simons and Hodges, 1998; Ainley et al., 2001). Collision with man-made structures is considered to be the second most significant cause of mortality of these seabird species in Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds often collide with manmade structures, and if they are not killed outright, the dazed or injured birds are easy targets of opportunity for feral mammals (Hadley, 1961; Telfer, 1979; Sincock, 1981; Reed et al., 1985; Telfer et al., 1987; Cooper and Day, 1998; Podolsky et al., 1998; Ainley et al., 2001; Hue et al., 2001; Day et al., 2003).

Mammalian Resources

The findings of the mammalian survey are consistent with the location of the site and the dense vegetation currently present on the property. It is likely that one or more of the four established alien rodents known from the Island of Maui, roof rat (*Rattus r. rattus*), Norway rat (*Rattus norvegicus*), Polynesian rat (*Rattus exulans hawaiiensis*), and European house mice (*Mus musculus domesticus*), use resources within the general project area on a seasonal basis. The one rat observed close to the dam was seen so briefly that it was not possible to identify to species.

Critical Habitat

There are no federally designated Critical Habitats for any plant or animal species currently protected under the endangered species act of 1973, as amended within the project action area.

Conclusions

It is not expected that the decommissioning to the Kōlea Dam and any attendant environmental modification within the project site will have a negative impact on any plant or animal species currently listed as endangered, threatened, or any that are currently proposed for listing under either federal or state endangered species statutes. Furthermore, the proposed action will not result in modification of any federally designated Critical Habitat, as there is none present on the subject property.

None of the aquatic species observed during these surveys is listed as threatened or endangered by the U.S. Fish and Wildlife Service under the Endangered Species Act of 1973, as amended, or by the State of Hawaii under its endangered species program (DLNR, 1998; USFWS, 2009). A Best Management Practices (BMP) plan should be designed and implemented to minimize environmental impacts to water quality in the vicinity of and downstream of the project site. Construction (dam removal) should be limited to the dry season to avoid sediment being carried by Kōlea Stream into Center Ditch or the Pacific Ocean. If possible, stream bed creation/alteration in place of the reservoir dam should include a waterfall feature lacking an overhanging lip.

From a native avian and mammalian perspective there is nothing unique about the habitat present within the project site, and none of the habitat is important habitat for any listed avian or mammalian species currently known from the Island of Maui.

If night-time construction activity or equipment maintenance is proposed during the construction phases of the project, all associated lights should be shielded, and when large flood/work lights are used they should be placed on poles that are high enough to allow the lights to be pointed directly at the ground.

If street lights or facility lighting is installed as part of this project, it is recommended that lights be shielded to reduce the potential for interactions of nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures (Reed et al., 1985; Telfer et al., 1987). This

minimization measure would serve the dual purpose of minimizing the threat of disorientation and downing of Hawaiian Petrels and Newell's Shearwaters, while at the same time complying with the Maui County Code § 20.35 *et seq*. that requires that all new exterior lights on Maui be shielded.

Glossary

Alien - Introduced to Hawai'i by human actions.
Commensal – Animals that share humans' food and lodgings, such as rats and mice.
Domesticated – Feral species, not considered established in the wild on the Island of Maui.
Endangered – Listed and protected under the ESA as an endangered species.
Endemic – Native and unique to the Hawaiian Islands.
Indigenous - Native to the Hawaiian Islands, but also found elsewhere naturally.
Low Head Dam – Also called a "run of the river dam"; a man-made structure built across a stream creating an impoundment within the banks of the stream (as opposed to creating a reservoir flooding land upstream well above the stream banks).
Naturalized – A plant or animal that has become established in an area where it is not native.
Ruderal – Disturbed areas, such as roadways and graded lots.
Threatened - Listed and protected under the ESA as a threatened species.
DLNR – Hawai'i State Department of Land & Natural Resources.
ESA - Federal Endangered Species Act of 1973, as amended.
USFWS – U.S. Fish & Wildlife Service

References

Ainley, D. G, R. Podolsky, L. Deforest, G. Spencer, and N. Nur. 2001. The Status and Population Trends of the Newell's Shearwater on Kaua'i: Insights from Modeling, *In*: Scott, J. M, S. Conant, and C. Van Riper III (editors) *Evolution, Ecology, Conservation, and Management of Hawaiian Birds: A Vanishing Avifauna.* Cooper's Ornithological Society, Allen Press, Lawrence, Kansas. Studies in Avian Biology No. 22: 108-123.

American Ornithologist's Union. 1998. *Check-list of North American Birds*. 7th edition. AOU. Washington D.C. 829pp.

_____. 2000. Forty-second supplement to the American Ornithologist's Union *Check-list of North American Birds*. *Auk,* 117: 847-858.

Banks, R. C., C. Cicero, J. L. Dunn, A. W. Kratter, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz. 2002. Forty-third supplement to the American Ornithologist's Union *Check-list of North American Birds*. *Auk*, 119: 897-906.

_____ , _____, _____, _____, _____, _____, _____, and _____. 2003 Forty-fourth supplement to the American Ornithologist's Union *Check-list of North American Birds*. *Auk*, 120: 923-931.

_____ , _____, _____, _____, _____, _____, _____, and _____. 2004 Forty-fifth supplement to the American Ornithologist's Union *Check-list of North American Birds*. *Auk*, 121: 985-995.

_____ , _____, _____, _____, _____, _____, _____, and _____. 2005 Forty-sixth supplement to the American Ornithologist's Union *Check-list of North American Birds*. *Auk*, 122: 1031-1031.

_____ , _____, _____, _____, _____, _____, _____, and _____. 2006 Forty-seventh supplement to the American Ornithologist's Union *Check-list of North American Birds*. *Auk*, 123: 926-936.

_____, C. R. Terry Chesser, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz. 2007 Forty-eighth supplement to the American Ornithologist Union *Check-list of North American Birds*. *Auk*, 124: 1109-1115.

_____, _____, _____, _____, _____, _____, _____, _____, _____, _____, and K. Winker. 2008 Forty-ninth supplement to the American Ornithologist Union *Check-list of North American Birds*. *Auk*, 125: 758-768.

Chesser, R. T., R. C. Banks, F. K. Barker, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz, and K. Winker. 2009. Fiftieth supplement to the American Ornithologist Union *Check-list of North American Birds*. *Auk*, 126: 1-10.

Cooper, B. A., and R. H. Day. 1998. Summer Behavior and Mortality of Dark-rumped Petrels and Newell's Shearwaters at Power Lines on Kauai. *Colonial Waterbirds*, 21(1): 11-19.

_____ and _____. 2003. Movement of Hawaiian Petrels to inland breeding sites on Maui Island, Hawaii. *Waterbirds*, 26: 62-71.

Cooper, B. A., and R. H. Day. 2004. Results of Endangered Bird and Bat Surveys at the Kaheawa Pastures Wind Energy Facility on Maui Island, Hawaii, Fall 2004. Prep. for Kaheawa Wind Power LLC, Makawao, HI and UPC Wind Management, LLC, Newton, MA.

Day, R. H., and B. A. Cooper. 1999. Results of Endangered Bird and Bat Surveys at the Proposed Kaheawa Pastures Wind Energy Facility on Maui Island, Hawaii, Summer 1999. Prep. for Zond Pacific, Wailuku, HI.

_____, _____, and T. C. Telfer. 2003. Decline of Townsend's (Newell's Shearwaters (*Puffinus auricularis newelli*) on Kauai, Hawaii. *The Auk*, 120: 669-679.

Department of Land and Natural Resources. (DLNR). 1998. Indigenous Wildlife, Endangered and Threatened Wildlife and Plants, and Introduced Wild Birds. Department of Land and Natural Resources. State of Hawaii. Administrative Rule §13-134-1 through §13-134-10, dated March 02, 1998.

_____ - Dept. of Aquatic Resources (DLNR-DAR). 2008. Atlas of Hawaiian Watersheds & Their Aquatic Resources. Island of Maui. 866 pp.

Englund, R. A. 1998. New records and range extensions of native Odonata (Coenagrionidae) and introduced aquatic species in the Hawaiian Islands. *Bishop Museum Occ. Pap*., 59: 15-16.

Gorresen, M. P, R. J. Camp, M. H. Reynolds, B. L. Woodworth, and T. K. Pratt. 2009. Status and Trends of Native Hawaiian Songbirds. *In:* Pratt. T. K., C. T. Atkinson, P. C. Banko, and B. L. Woodworth (editors) *Conservation Biology of Hawaiian Forest Birds*. Yale University Press. 707 pp.

Hadley, T. H. 1961. Shearwater calamity on Kauai. *Elepaio*, 21: 60.

Hue, D., C. Glidden, J. Lippert, L. Schnell, J. MacIvor and J. Meisler. 2001. Habitat use and limiting factors in a population of Hawaiian Dark-rumped Petrels on Mauna Loa, Hawai'i. Pp. 234-242, *in*: Scott, J. M, S. Conant, and C. Van Riper III (editors) *Evolution, Ecology, Conservation, and Management of Hawaiian Birds: A Vanishing Avifauna.* Studies in Avian Biology No. 22. Cooper's Ornithological Society, Allen Press, Lawrence, Kansas.

Kennedy, C. H. 1934. *Kilauagrion dinesiotes*, a new species of dragonfly (Odonata) from Hawaii. *Annals. Ent. Soc. Amer*., 27: 343-345.

Moore, N. W., and W. C. Gagne. 1982. *Megalagrion pacificum* (McLachlan) – A preliminary study of the conservation requirements of an endangered species. Reports of the Odonata Specialist Group Species Survival Commission, International Union for Conservation of Nature and Natural Resources 3: 1-5.

Office of State Planning (OSP). 1994. State definition and delineation of watershed. Prep. by Geographic Decision Systems International and Eugene P. Dashiell, AICP.

Palmer, D. D. 2003. *Hawai`i's ferns and fern allies*. University of Hawaii Press, Honolulu. 324 pp.

Podolsky, R., D. G. Ainley, G. Spencer, L. de Forest, and N. Nur. 1998. Mortality of Newell's Shearwaters Caused by Collisions with Urban Structures on Kaua'i. *Colonial Waterbirds,* 21: 20-34.

Polhemus, D. A. 1995. New Heteroptera and Odonata (Insecta) records and range extensions in the Hawaiian Islands. *Bishop Mus. Occas. Pap*., 42: 42-43.

_____. 2004. A revision of the Hawaiian damselflies in the genus *Megalagrion* (Odonata: Coenagrionidae). Unpublished report to U.S. Fish and Wildlife Service, Pacific Islands Office. pp. 1-2, 36-40, 43-48, 52-54, and 58-68.

_____, and A. Asquith. 1996. *Hawaiian Damselflies. A Field Identification Guide*. Bishop Museum Press. 122 pp.

Pukui , M. K., S. H. Elbert, and E. T. Mookini. 1974. *Place Names of Hawaii*. University of Hawaii Press. Honolulu, Hawai'i. 289 pp.

Reed, J. R., J. L Sincock, and J. P. Hailman 1985. Light Attraction in Endangered Procellariform Birds: Reduction by Shielding Upward Radiation. *Auk*, 102: 377-383.

Simons, T. R., and C. N. Hodges. 1998. Dark-rumped Petrel (*Pterodroma phaeopygia*). *In:* A. Poole and F. Gill (editors). *The Birds of North America, No. 345*. The Academy of Natural Sciences, Philadelphia, PA. and the American Ornithologists Union, Washington, D.C.

Sincock, J. L. 1981. Saving the Newell ʻs Shearwater. Pages 76-78 in Proceedings of the Hawaii Forestry and Wildlife Conference, 2-4 October 1980. Department of Land and Natural Resources State of Hawaii, Honolulu.

Staples, G. W. and D. R. Herbst. 2005. *A Tropical Garden Flora. Plants Cultivated in the Hawaiian Islands and other Tropical Places*. Bishop Museum, Honolulu. 908 pp.

Telfer, T. C. 1979. Successful Newell's Shearwater Salvage on Kauai. *'Elepaio*, 39: 71

_____, J. L. Sincock, G. V. Byrd, and J. R. Reed. 1987. Attraction of Hawaiian seabirds to lights: Conservation efforts and effects of moon phase. *Wildlife Society Bulletin*, 15: 406-413.

The Nature Conservancy (TNC). 2010. Waikamoi Preserve, Island of Maui. Available at URL http://www.nature.org/wherewework/northamerica/states/Hawaii/preserves/art2358.html; last visited April 26, 2010.

Tomich, P.Q. 1986. *Mammals in Hawaii*. Bishop Museum Press. Honolulu, Hawaii. 37 pp.

U.S. Fish & Wildlife Service (USFWS). 1983. Hawaiian Dark-Rumped Petrel & Newell's Manx Shearwater Recovery Plan. USFWS, Portland, Oregon. February 1983.

_____. 2002. Endangered and Threatened Wildlife and Plants: Designation of Critical Habitat for 60 Plant Species from the Islands of Maui and Kahoolawe, HI. Final Rule. 50 CFR Part 17. *Federal Register*, 68(93; May 14, 2003): 25933-25982.

_____. 2005a. Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants. Review of Species That Are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petition; Annual Description of Progress on Listing Actions. *Federal Register*, 70 (90; Wednesday, May 11, 2005): 24870-24934.

_____. 2005b. Endangered and Threatened Wildlife and Plants. 50CFR 17:11 and 17:12 (Tuesday, November 1, 2005).

_____. 2009a. Endangered and Threatened Wildlife and Plants. 50CFR 17:11 and 17:12. Available online at URL: http://ecos.fws.gov/tess_public/pub/stateListingIndividual.jsp?state=HI&status=listed; last accessed on April 25, 2010.

U.S. Fish & Wildlife Service (USFWS). 2009b. Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for Flying Earwig Hawaiian Damselfly (*Megalagrion nesiotes*) and Pacific Hawaiian Damselfly (*M. pacificum*) Throughout Their Ranges. Federal Register, 74(129): 32490-32519 (July 8, 2009). Note: several references in this document are cited but not given, or otherwise appear incorrect.

_____. 2009c. U.S. Fish and Wildlife species assessment and listing priority assignment form (*Megalagrion xanthomelas*). URL: http://ecos.fws.gov/docs/candforms_pdf/r1/I063_I01. pdf; last visited January 15, 2010.

_____. 2010. USFWS Threatened and Endangered Species System (TESS), online at URL: http://ecos.fws.gov/tess_public/StartTESS.do

Wagner, W. L., D. R Herbst, and S. H. Sohmer. 1990. *Manual of the Flowering Plants of Hawai'i*. University of Hawaii Press, Honolulu. 1854 pp.

_____ and _____. 1999. *Supplement to the Manual of the Flowering Plants of Hawai'i.* Pp. 1855-1918 *in:* Wagner, W. L., D. R. Herbst, and S. H. Sohmer, *Manual of the Fowering Plants of Hawai'i.* Revised Edition. 2 vols. University of Hawaii Press and Bishop Museum Press, Honolulu.

Page Intentionally Left Blank

APPENDIX E

Geophysical Survey

Global Geophysics

16651 White Mountain Road SE
Monroe, WA 98272
Tel: 425-890-4321
Fax: 360-805-0259

May 6, 2010 Our Ref.: 100-0413.000

Oceanit
828 Fort St. Mall, Suite 600
Honolulu, HI 96813

Attention: Mr. Derrick Elfalan

RE: REPORT ON THE GEOPHYSICAL SURVEY AT KOLEA RESERVOIR, MAUI, HAWAII

Dear Mr. Elfalan:

Global Geophysics conducted a seismic refraction survey at Kolea Reservoir on April 27, 2010. The proposed objectives of the geophysical investigations are to determine the depth to bedrock and rock rippability.

METHODOLOGY AND INSTRUMENTATION

Both electrical resistivity tomography (ERT) and seismic refraction were proposed for this project. However, ERT system was not functioning. Only seismic refraction was used for this study. The following paragraphs describe the method and field procedure.

Seismic refraction

Seismic refraction is the traditional method for determining the rock velocity for rock rippability using a controlled energy source (hammer, blank shotgun shells, or chemical explosives) to generate a seismic signal. The seismic signals are received by a series of geophones (24, for example) that are connected to a seismic cable laid on the ground surface in a linear manner. The geophones, evenly spaced along the geophone cable, are placed on the ground surface. The seismic energy source is discharged at several places along the array and off both ends.

The seismic wavelets travel through the earth to the geophones that convert the acoustic energy in the ground to an electric signal in the geophone cable. The seismograph detects the arriving electric signals with respect to time and stores the records for future data processing. The seismic data is processed to determine the seismic velocity of the earth material through which the energy has traveled and to model the subsurface geology. This geophysical model depicts the earth in cross-section showing the velocity and thickness of the subsurface layers below the seismic line

The seismic refraction survey was conducted using a Geometrics Geode 24-channel digital seismograph. The sensors were Mark Products 4.5-Hz vertical geophones and the seismic energy sources were a 20 lbs sledge hammer. The weight drop method appeared to provide sufficient energy and it was subsequently used for the survey. The typical field procedure consisted of laying out the cables and planting the geophones at 10-16.4 ft intervals. The sledge hammer was pounded at seven

locations along the geophone array. Data were collected and saved in digital format and a field record was produced on the computer screen to QA/QC the data in real time.

RESULTS

Seismic refraction data was collected along Lines 1 and 2. The locations of these lines are shown in Figure 1. The interpreted profiles are shown in Figure 2. The results are summarized as follows:

1. The depth to bedrock varies from 5 ft to 34 ft;
2. The velocity of the bedrock at the soil/bedrock interface is 7,650 ft/s.

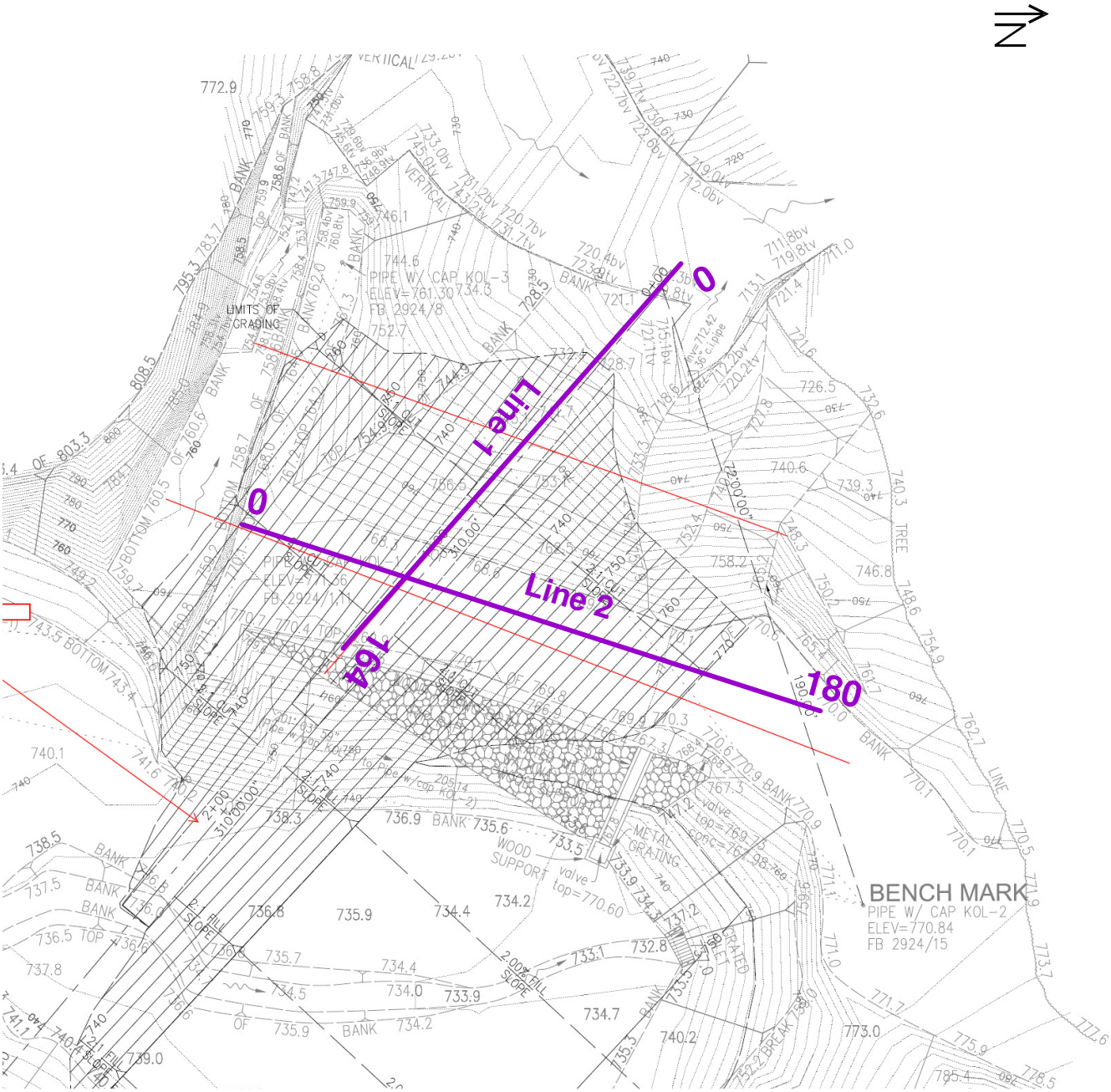
LIMITATIONS OF THE GEOPHYSICAL METHOD

Global geophysics services are conducted in a manner consistent with the level of care and skill ordinarily exercised by other members of the geophysical community currently practicing under similar conditions subject to the time limits and financial and physical constraints applicable to the services. Refraction is a remote sensing geophysical method that may not detect all subsurface conditions due to the limitations of the methods, soil conditions, size of the features and their depths.

Sincerely,

Global Geophysics

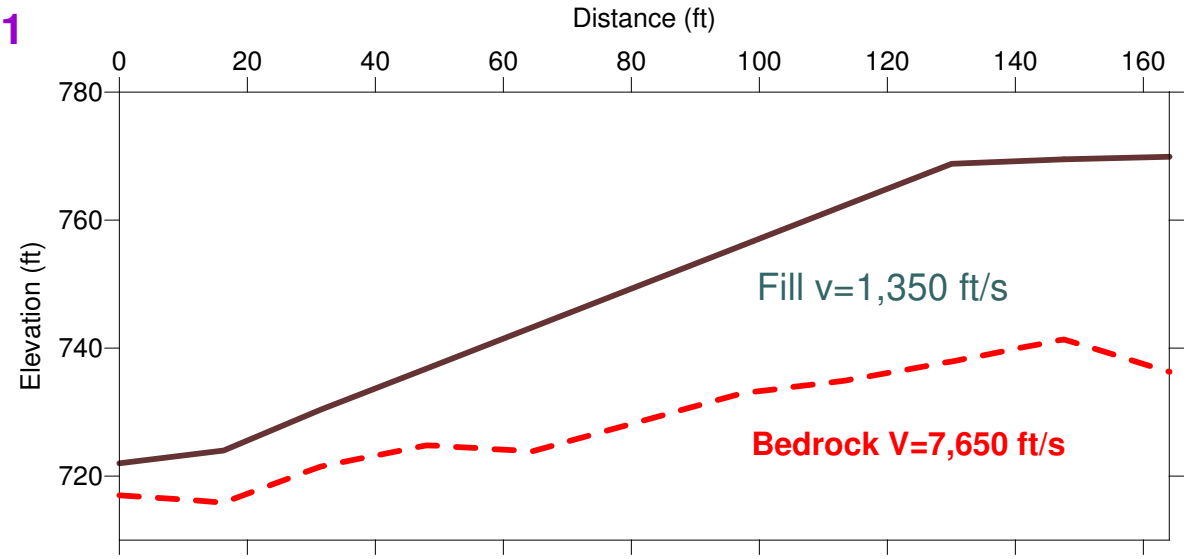
John Liu, Ph.D., R.G.
Principal Geophysicist



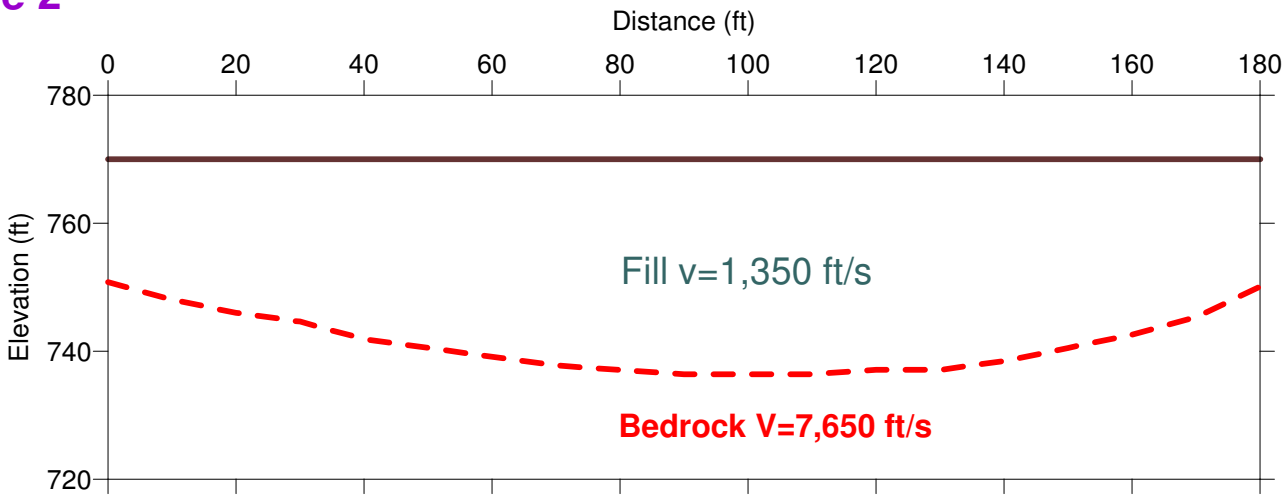
Note: Map is not scaled

PROJECT	**Kelea Reservoir Project** **Oceanit**		
TITLE	**Seismic Line Location Map**		
Global Geophysics 16651 White Mountain Road SE Monroe, WA, 98272 Tel: 425-890-4321	PROJECT NO.: 100-0413.000	FILE No.	
	DESIGN --	SCALE AS SHOWN	REV.
	CADD JL	**FIGURE 1**	
	CHECK JL		
	REVIEW --		

Line 1



Line 2



PROJECT

Kelea Reservoir Project
Oceanit

TITLE

Interpreted Seismic Profiles

Global Geophysics
16651 White Mountain Road SE
Monroe, WA, 98272
Tel: 425-890-4321

PROJECT NO.: 100-0413.000			FILE No.
DESIGN	--		SCALE AS SHOWN REV.
CADD	JL		
CHECK	JL		
REVIEW	--		

FIGURE 2

Page Intentionally Left Blank

APPENDIX F

Construction Plans

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA RESERVOIR (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS

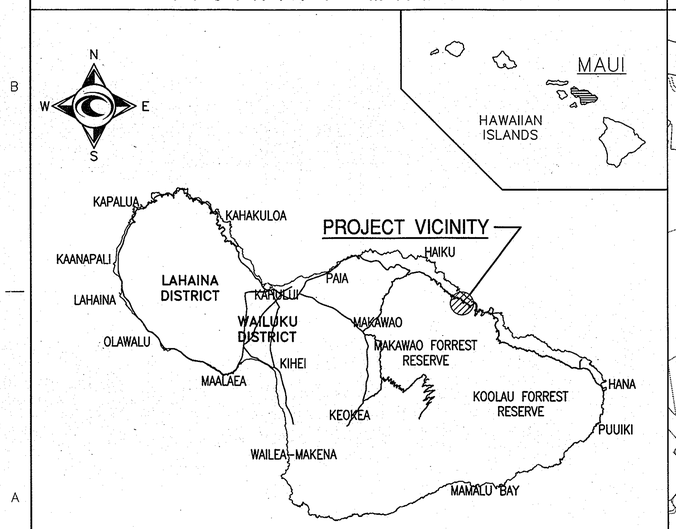
TAX MAP KEY: 1-1-001:050
HAIKU, MAUI, HAWAII

FOR THE
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE OF HAWAII

AND THE
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
PUBLIC WORKS DIVISION
STATE OF HAWAII

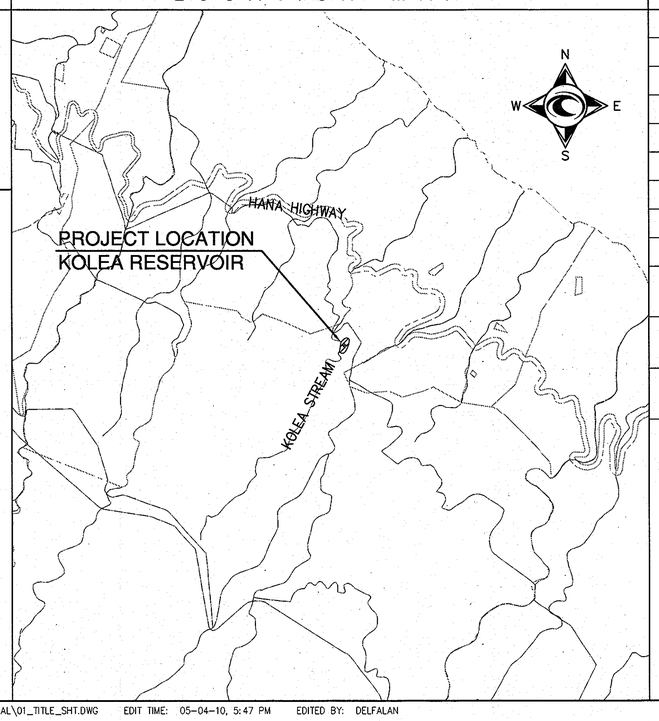
D.A.G.S. JOB NO. 15-23-7409

VICINITY MAP



ISLAND OF MAUI
NOT TO SCALE

LOCATION MAP



SHEET INDEX

DWG. NO.	SHT. NO.	DESCRIPTION OF DRAWINGS
T-1	1	TITLE SHEET
T-2	2	NOTES
T-3	3	NOTES
EG-1	4	EXISTING SITE PLAN
EG-2	5	DEMOLITION PLAN
EC-1	6	STREAM DIVERSION AND EROSION CONTROL PLAN
C-1	7	GRADING PLAN
C-2	8	BREACH CHANNEL – PLAN & PROFILE
C-3	9	BREACH CHANNEL – CROSS SECTIONS STA. 0+00 TO 0+75
C-4	10	BREACH CHANNEL – CROSS SECTIONS STA. 1+00 TO 1+75
C-5	11	BREACH CHANNEL – CROSS SECTIONS STA. 2+00 TO 3+00

APPROVED

5/5/2010
CHAIRPERSON, DEPARTMENT OF LAND AND NATURAL RESOURCES, STATE OF HAWAII — DATE

5/6/10
COMPTROLLER, DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES, STATE OF HAWAII — DATE

5/6/10
PUBLIC WORKS ADMINISTRATOR, DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES, STATE OF HAWAII — DATE

REVISION NO.	SYM.	DESCRIPTION	SHT.__ OF__	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 3, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature — 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

TITLE SHEET

oceanit

DESIGNED BY:	CHECKED BY:	DAGS JOB NO.	DRAWING NO.
AK	DE	15-23-7409	T-1
DRAWN BY: AK	APPROVED BY:	DATE: MAY 2010	SHEET 1 OF 11 SHTS
SCALE: AS NOTED			

FILE_____ DRAWER_____ FOLDER_____

DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\01_TITLE_SHT.DWG EDIT TIME: 05-04-10, 5:47 PM EDITED BY: DELFALAN

GENERAL CONSTRUCTION NOTES

1. ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986 AND STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984, AS AMENDED, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU AND THE COUNTIES OF KAUAI, MAUI, AND HAWAII.

2. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY, AND ENVIRONMENTAL QUALITY.

3. PERMITS SHALL BE OBTAINED BY THE CONTRACTOR.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS", AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL", AS WELL AS CHAPTER 14 OF THE REVISED ORDINANCES OF HONOLULU, AS AMENDED. BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION.

5. THE CONTRACTOR SHALL CONDUCT ALL TESTS SPECIFIED AND BE RESPONSIBLE FOR EXPENSES INCURRED IN CONDUCTING THESE TESTS.

6. VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS PRIOR TO THE START OF CONSTRUCTION. IF DIMENSIONAL ERRORS OR CONFLICTS OCCUR, THE CONTRACTOR SHALL NOTIFY THE OFFICER IN CHARGE (OIC) AND SHALL WAIT FOR CLARIFICATION BEFORE RESUMING OR COMMENCING WORK ON THE DISCREPANCY ITEM.

7. DIMENSIONS TAKE PRECEDENCE OVER SCALE.

8. THE STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES INCLUDE, BUT ARE NOT LIMITED TO, BRACING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, WIND, SEISMIC, ETC. OBSERVATION VISITS TO THE SITE BY THE OIC SHALL NOT INCLUDE INSPECTION OF THE ABOVE ITEMS.

9. ALL MATERIALS SHALL CONFORM TO THE DRAWING AND SPECIFICATIONS.

10. THE CONTRACTOR SHALL COORDINATE THE STORAGE OF HIS MATERIAL WITH THE OIC.

11. RESTRICT ALL VEHICLES, MATERIAL STOCKPILES AND EQUIPMENT TO WITHIN THE CONTRACT LIMIT LINES. ANY TOOLS, MATERIALS, EQUIPMENT, FENCING, ETC. THAT THE CONTRACTOR KEEPS IN THIS AREA ARE STORED AT THE CONTRACTOR'S RISK. IF OTHER SHORT TERM STORAGE AREAS ARE NEEDED, THEY MAY BE ARRANGED THROUGH THE OIC

12. NO CONSTRUCTION EQUIPMENT SHALL BE PARKED WITHIN THE FACILITY ROADWAYS IN SUCH A MANNER THAT THE EQUIPMENT WILL OBSTRUCT THE NORMAL MOVEMENT AND SIGHT DISTANCE OF THE DRIVING MOTORIST, EXCEPT DURING ACTUAL WORKING HOURS.

13. DAMAGE OUTSIDE THE CONTRACT ZONE LIMITS AS A RESULT OF CONSTRUCTION OPERATIONS SHALL BE RESTORED TO ITS ORIGINAL, BETTER CONDITION. SUCH RESTORATION SHALL BE TO THE SATISFACTION OF THE OIC.

14. ALL WORK CALLED FOR ON THE PLANS AND NOT ITEMIZED IN THE PROPOSAL AND ALL WORK NOT CALLED FOR BUT REQUIRED FOR THE CONSTRUCTION OF THIS PROJECT, SHALL BE CONSIDERED INCIDENTAL.

15. CONDITIONS OF THE WORK: ALL WORK SHALL BE PERFORMED IN A PROFESSIONAL AND WORKMANSHIP-LIKE MANNER. CONTRACTOR SHALL NOTIFY THE OIC SHOULD CONDITIONS EXIST WHICH WILL PREVENT SUCH PERFORMANCE AND/OR ANY ADDITIONAL WORK TO BE PERFORMED BEFORE STARTING WORK.

16. EXISTING TOPOGRAPHIC DATA WAS TAKEN FROM TOPOGRAPHIC MAP PREPARED BY PAREN, INC. (DBA PARK ENGINEERING), DATED MARCH 18, 2010.

WATER POLLUTION CONTROL NOTES

GENERAL:

1. THE CONTRACTOR IS REMINDED OF THE REQUIREMENTS OF SECTION 209 – WATER POLLUTION AND EROSION CONTROL, IN THE "HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION". SECTION 209 DESCRIBES BUT IS NOT LIMITED TO: SUBMITTAL REQUIREMENTS; SCHEDULING OF A WATER POLLUTION AND EROSION CONTROL CONFERENCE WITH THE OIC; CONSTRUCTION REQUIREMENTS; METHOD OF MEASUREMENT; AND BASIS OF PAYMENT.

2. THE CONTRACTOR SHALL FOLLOW THE GUIDELINES IN THE "BEST MANAGEMENT PRACTICES MANUAL FOR CONSTRUCTION SITES IN HONOLULU", DATED MAY 1999 IN DEVELOPING, INSTALLING AND MAINTAINING THE BEST MANAGEMENT PRACTICES (BMP) FOR THE PROJECT.
   HTTP://WWW.CLEANWATERHONOLULU.COM/REPORTS/BMP_MANUAL.PDF

WATER POLLUTION CONTROL NOTES (CONT.)

3. THE OIC MAY ASSESS LIQUIDATED DAMAGES OF UP TO $25,000 FOR NONCOMPLIANCE OF EACH BMP REQUIREMENT AND EACH REQUIREMENT STATED IN SECTION 209, FOR EVERY DAY OF NON-COMPLIANCE. THERE IS NO MAXIMUM LIMIT ON THE AMOUNT ASSESSED PER DAY.

4. THE OIC WILL DEDUCT THE COST FROM THE PROGRESS PAYMENT FOR ALL CITATIONS RECEIVED BY THE DEPARTMENT FOR NONCOMPLIANCE, OR THE CONTRACTOR SHALL REIMBURSE THE STATE FOR THE FULL AMOUNT OF THE OUTSTANDING COST INCURRED BY THE STATE.

WASTE DISPOSAL:

1. WASTE MATERIALS – ALL WASTE MATERIALS SHALL BE COLLECTED AND DISPOSED OF PROPERLY BY END OF CONSTRUCTION. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ONSITE. THE CONTRACTOR'S SUPERVISORY PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL. NOTICES STATING THESE PRACTICES SHALL BE POSTED IN THE OFFICE TRAILER AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEEING THAT THESE PROCEDURES ARE FOLLOWED.

2. HAZARDOUS WASTE – ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER. THE CONTRACTOR'S SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES AND SHALL BE RESPONSIBLE FOR SEEING THAT THESE PRACTICES ARE FOLLOWED. CLEAN CONCRETE SPOILS MAY BE DEPOSITED IN NELHA DESIGNATED SPOILS AREA. ALL CONCRETE SPOILS MUST BE CLEANED OF REBAR, METAL FASTENERS, ETC. BEFORE DEPOSITING IN NELHA SPOILS AREAS.

3. SANITARY WASTE – ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK, OR AS REQUIRED.

GOOD HOUSEKEEPING BEST MANAGEMENT PRACTICES:

1. MATERIALS POLLUTION PREVENTION PLAN

   A. APPLICABLE MATERIALS OR SUBSTANCES LISTED BELOW ARE EXPECTED TO BE PRESENT ONSITE DURING CONSTRUCTION. OTHER MATERIALS AND SUBSTANCES NOT LISTED BELOW SHALL BE ADDED TO THE INVENTORY.

DETERGENTS	PETROLEUM BASED PRODUCTS
PAINTS (ENAMEL AND LATEX)	CLEANING SOLVENTS
METAL STUDS	WOOD
CONCRETE	

   B. MATERIAL MANAGEMENT PRACTICES SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES TO STORM WATER RUNOFF. STORE ONLY ENOUGH PRODUCT AS IS REQUIRED TO DO THE JOB.

   C. ALL MATERIALS STORED ONSITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR APPROPRIATE CONTAINERS AND IF POSSIBLE UNDER A ROOF OR OTHER ENCLOSURE.

   D. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS WITH THE ORIGINAL MANUFACTURER'S LABEL.

   E. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.

   F. WHENEVER POSSIBLE, A PRODUCT SHALL BE USED UP COMPLETELY BEFORE DISPOSING OF THE CONTAINER.

   G. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED.

   H. THE CONTRACTOR SHALL CONDUCT A DAILY INSPECTION TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS ON SITE.

2. HAZARDOUS MATERIAL POLLUTION PREVENTION PLAN

   A. PRODUCTS SHALL BE KEPT IN ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE.

   B. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHEETS (MSDS) SHALL BE RETAINED.

   C. SURPLUS PRODUCTS SHALL BE DISPOSED OF ACCORDING TO MANUFACTURERS' INSTRUCTIONS OR LOCAL AND STATE RECOMMENDED METHODS.

3. ONSITE AND OFF SITE PRODUCT SPECIFIC PLAN

   A. THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ONSITE:

   1) PETROLEUM BASED PRODUCTS – ALL ONSITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED.

WATER POLLUTION CONTROL NOTES (CONT.)

   2) CONCRETE TRUCKS –

      a. CONCRETE TRUCKS SHALL BE ALLOWED TO WASH OUT OR DISCHARGE DRUM WASH WATER ONLY AT SITE DESIGNATED BY OIC. WATER SHALL NOT BE DISCHARGED IN THE STREAMS. THE CONTRACTOR SHALL CONTACT DRINKING WATER BRANCH, DEPARTMENT OF HEALTH AT 586-4258 TO RECEIVE PERMISSION TO DESIGNATE A DISPOSAL SITE. THE CONTRACTOR SHALL CLEAN DISPOSAL SITE AS REQUIRED OR AS REQUESTED BY THE OWNER'S REPRESENTATIVE.

      b. THE CONCRETE WASH WATER SHALL BE CONTAINED IN A PIT WITH AN IMPERMEABLE LINER TO PREVENT ANY INFILTRATION. A BERM SHALL BE CONSTRUCTED AROUND THE PIT TO PREVENT OVERFLOW OF WASH WATER AND THE ENTRY OF STORM WATER RUNOFF. THE PIT SHALL ALSO BE LARGE ENOUGH TO CONTAIN THE ANTICIPATED VOLUME OF WASH WATER.

4. SPILL CONTROL PLAN

   A. A SPILL PREVENTION PLAN SHALL BE POSTED AND ADJUSTED TO INCLUDE A DESCRIPTION AND CAUSE OF EACH SPILL, MEASURES TO PREVENT AND CLEAN UP EACH SPILL.

   B. THE CONTRACTOR SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR. THE CONTRACTOR SHALL DESIGNATE AT LEAST THREE SITE PERSONNEL WHO SHALL RECEIVE SPILL PREVENTION AND CLEANUP TRAINING. THESE INDIVIDUALS SHALL EACH BECOME RESPONSIBLE FOR A PARTICULAR PHASE OF PREVENTION AND CLEANUP. THE NAMES OF RESPONSIBLE SPILL PERSONNEL SHALL BE POSTED IN THE MATERIAL STORAGE AREA AND IN THE OFFICE TRAILER ONSITE.

   C. MANUFACTURERS' RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES.

   D. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ONSITE.

   E. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY. NOTIFY OIC IMMEDIATELY OF ALL SPILLS.

   F. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.

   G. SPILLS OF TOXIC HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY, REGARDLESS OF THE SIZE.

GRADING NOTES

1. ALL GRADING WORK SHALL BE DONE IN ACCORDANCE WITH CHAPTER 14, ARTICLES 13, 14, 15 AND 16, AS RELATED TO GRADING, SOIL EROSION AND SEDIMENT CONTROL OF THE REVISED ORDINANCES OF HONOLULU, 1990.

2. THE CONTRACTOR SHALL COMPLY WITH NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REQUIREMENTS. THE CONTRACTOR SHALL NOT START CONSTRUCTION UNTIL NOTICE OF GENERAL PERMIT COVERAGE (NGPC) IS RECEIVED FROM THE DEPARTMENT OF HEALTH, STATE OF HAWAII AND HAS SATISFIED ANY OTHER APPLICABLE REQUIREMENTS OF THE NPDES PERMIT PROGRAM.

3. NO CONTRACTOR SHALL PERFORM ANY GRADING OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.

4. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS CONTAINED IN THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 60.1, "AIR POLLUTION CONTROL".

5. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.

6. ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SURFACE WATERS FROM DAMAGING THE CUT FACE OF AN EXCAVATION OR THE SLOPED SURFACES OF A FILL. FURTHERMORE, ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE SITE.

GRADING NOTES

7. ALL SLOPES AND EXPOSED AREAS SHALL BE SODDED OR PLANTED AS SOON AS FINAL GRADES HAVE BEEN ESTABLISHED. PLANTING SHALL NOT BE DELAYED UNTIL ALL GRADING WORK HAS BEEN COMPLETED. GRADING TO FINAL GRADE SHALL BE CONTINUOUS, AND ANY AREA WITHIN WHICH WORK HAS BEEN INTERRUPTED OR DELAYED SHALL BE PLANTED.

8. FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.

9. PROJECT WHEN THE APPLICATION FOR A GRADING PERMIT IS MADE. THE BORROW/DISPOSAL SITE MUST ALSO FULFILL THE REQUIREMENTS OF THE GRADING ORDINANCE.

10. NO GRADING WORK SHALL BE DONE ON SATURDAYS, SUNDAYS AND HOLIDAYS AT ANY TIME WITHOUT PRIOR NOTICE TO THE DIRECTOR, D.P.P., PROVIDED SUCH GRADING WORK IS ALSO IN CONFORMANCE WITH THE COMMUNITY NOISE CONTROL STANDARDS CONTAINED IN THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 46, "COMMUNITY NOISE CONTROL".

11. PURSUANT TO CHAPTER 6E, HRS, IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE HONOLULU POLICE DEPARTMENT, THE STATE DEPARTMENT OF LAND AND NATURAL RESOURCES-HISTORIC PRESERVATION DIVISION (692-8015). IN ADDITION, FOR NON-CITY PROJECTS, THE CONTRACTOR SHALL INFORM THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING (768-8084); AND FOR CITY PROJECTS, NOTIFY THE RESPONSIBLE CITY AGENCY.

12. THE LIMITS OF THE AREA TO BE GRADED SHALL BE FLAGGED BEFORE THE COMMENCEMENT OF THE GRADING WORK.

13. ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS", AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL", AND IF APPLICABLE, THE NPDES PERMIT FOR THE PROJECT.

14. WHERE APPLICABLE AND FEASIBLE THE MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY EARTH MOVING PHASE OF THE GRADING IS INITIATED.

15. TEMPORARY EROSION CONTROLS SHALL NOT BE REMOVED BEFORE PERMANENT EROSION CONTROLS ARE IN-PLACE AND ESTABLISHED.

16. TEMPORARY EROSION CONTROL PROCEDURES SHALL BE SUBMITTED FOR APPROVAL PRIOR TO APPLICATION FOR GRADING PERMIT.

17. IF THE GRADING WORK INVOLVES CONTAMINATED SOIL, THEN ALL GRADING WORK SHALL BE DONE IN CONFORMANCE WITH APPLICABLE STATE AND FEDERAL REQUIREMENTS.

REVISION NO.	SYM.	DESCRIPTION	SHT.___ OF.___	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

NOTES

oceanit

DESIGNED BY: AK	CHECKED BY: DE	DAGS JOB NO. 15-23-7409	DRAWING NO. T-2
DRAWN BY: AK	APPROVED BY:	DATE MAY 2010	SHEET 2 OF 11 SHTS
SCALE: AS NOTED			

DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\02_03_NOTES.DWG EDIT TIME: 05-10-10, 9:43 AM EDITED BY: AKEANE

FILE_____ DRAWER_____ FOLDER_____

PUBLIC HEALTH SAFETY AND CONVENIENCE NOTES

1. CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL QUALITY.

2. THE CONTRACTOR AT HIS/HER EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM RUBBISH, DUST, NOISE, EROSION, ETC. THE WORK SHALL BE DONE IN CONFORMANCE WITH THE AIR AND WATER POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.

3. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SILT OR DEBRIS IN ANY FORM TO FALL SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATION OCCUR, THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS AS NECESSARY.

4. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC.

5. THE CONTRACTOR SHALL CONTROL ACCESS TO ALL OPENINGS TO PREVENT UNAUTHORIZED ENTRY UNDERGROUND. UNUSED CHUTES, MANWAYS, OR OTHER OPENINGS SHALL BE TIGHTLY COVERED, BULKHEADED, OR FENCED OFF, AND SHALL BE POSTED WITH WARNING SIGNS INDICATING "KEEP OUT" OR SIMILAR LANGUAGE. COMPLETED OR UNUSED SECTIONS OF THE UNDERGROUND FACILITY SHALL BE BARRICADED.

6. THE CONTRACTOR'S ATTENTION IS DIRECTED TO CHAPTER 46, PUBLIC HEALTH REGULATIONS, DEPARTMENT OF HEALTH, STATE OF HAWAII, "COMMUNITY NOISE CONTROL," IN WHICH MAXIMUM PERMISSIBLE NOISE LEVELS HAVE BEEN SET. IF THE CONSTRUCTION WORK REQUIRES A PERMIT FROM THE DIRECTOR OF HEALTH, THE CONTRACTOR SHALL OBTAIN A COPY OF CHAPTER 46 AND BECOME FAMILIAR WITH THE NOISE LEVEL RESTRICTIONS AND THE PROCEDURES FOR OBTAINING A PERMIT FOR THE CONSTRUCTION ACTIVITIES. APPLICATION AND INFORMATION ON VARIANCES ARE AVAILABLE FROM THE ENVIRONMENTAL PROTECTION AND HEALTH SERVICES DIVISION, 1250 PUNCHBOWL ST., HONOLULU, HI 96813 OR BY TELEPHONE (548-6455).

SEQUENCE OF CONSTRUCTION

1. LOWER WATER LEVEL IN KOLEA RESERVIOR TO BOTTOM.
2. INSTALL REQUIRED TEMPORARY EROSION CONTROL ITEMS.
3. INSTALL TEMPORARY STORM WATER BYPASS BERM, SIPHON AND DRAIN LINES.
4. CONSTRUCT DAM BREACH AND EMBANKMENT FILL.
5. INSTALL GROUTED RIPRAP TO DAM BREACH CHANNEL AS REQUIRED.
6. INSTALL PERMANENT EROSION CONTROL ITEMS.
7. REMOVE TEMPORARY STROM WATER BYPASS ITEMS.
8. REMOVE TEMPORARY EROSION CONTROL ITEMS.

REVISION NO.	SYM.	DESCRIPTION	SHT.___ OF___	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

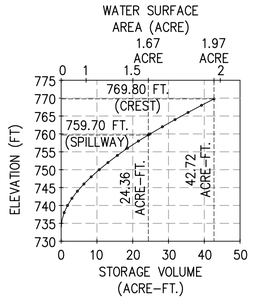
DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

NOTES

oceanit	DAGS JOB NO.	DRAWING NO.
DESIGNED BY: AK / CHECKED BY: DE	15-23-7409	T-3
DRAWN BY: AK / APPROVED BY:	DATE: MAY 2010	SHEET 3 OF 11 SHTS
SCALE: AS NOTED		

DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\02_03_NOTES.DWG EDIT TIME: 05-10-10, 9:44 AM EDITED BY: AKEANE

FILE_____ DRAWER_____ FOLDER_____



KOLEA RESERVOIR: ELEVATION VS. AREA/STORAGE VOLUME RATING CURVE

TRUE NORTH
SCALE: 1 In. = 20 Ft.

"I" CUT ON ROCK KOL-4
ELEV=756.53
FB 2924/9

186° 24' 37" 299.94 ("I"cut on rock KOL-4 to Pipe w/cap KOL-1)

(Pipe w/cap KOL-2 to "I" cut on rock KOL-4) 12° 21' 20" 501.10

(Pipe w/cap KOL-1 to Pipe w/cap KOL-2) 201° 03' 59" 205.14

PIPE W/ CAP KOL-1
ELEV=771.36
FB 2924/1,11

PIPE W/ CAP KOL-3
ELEV=761.30
FB 2924/8

EXIST. ROCK CUT RESERVOIR SPILLWAY

EXIST. 36-INCH ø CAST IRON PIPE. OUTLET WORKS DISCHARGE INV.= 712.42

EXIST. VALVE CONTROL WHEEL

EXIST. WOODEN PIER & FLOW CONTROL VALVE

EXIST. GRATED DRAIN INLET

DAM CREST / ACCESS ROAD

KOLEA RESERVOIR

BENCH MARK
PIPE W/ CAP KOL-2
ELEV=770.84
FB 2924/15

NOTES:

1. UNDERGROUND PUBLIC UTILITIES SHOWN HEREON ARE FOR INFORMATION ONLY. NO GUARANTEE IS MADE ON THE ACCURACY OR COMPLETENESS OF SAID INFORMATION.
2. ALL AZIMUTHS SHOWN ARE REFERRED TO NAD83, HAWAII ZONE 2 STATE PLANE COORDINATE SYSTEM. TO CONVERT STATE PLANE AZIMUTHS TO AZIMUTHS REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "HANAWI 1877", MINUS (–) 0° 12' 03.6".
3. ELEVATIONS OBTAINED FROM GPS OVSERVATIONS AND GEOID MODEL, GEOID 99 (HAWAII).

DATE: MARCH 18, 2010
FIELD BOOK NO. 2924
TAX MAP KEY: 1–1–01:Por.50, DIVISION 2

LEGEND:

1980' EXISTING CONTOUR

DIRECTION OF SURFACE DRAINAGE

GRAPHIC SCALE:

20' 10' 0 20' 40'

SCALE: 1" = 20'

EXISTING SITE PLAN

SCALE: 1" = 20'–0"

IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

REVISION NO.	SYM.	DESCRIPTION	SHT.__ OF__	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1–1–01:50
HAIKU, MAUI, HAWAII

EXISTING SITE PLAN

oceanit

DESIGNED BY: —	CHECKED BY: —	DAGS JOB NO. 15-23-7409	DRAWING NO. EG-1
DRAWN BY: AK	APPROVED BY:	DATE MAY 2010	SHEET 4 OF 11 SHTS
SCALE: AS NOTED			

DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\04_EXIST_PLAN.DWG EDIT TIME: 05-10-10, 9:44 AM EDITED BY: AKEANE

FILE.....DRAWER.....FOLDER.....

TRUE NORTH
SCALE: 1 In. = 20 Ft.

"1" CUT ON ROCK KOL-4
ELEV=756.53
FB 2924/9

PIPE W/ CAP KOL-3
ELEV=761.30
FB 2924/8

PIPE W/ CAP KOL-1
ELEV=771.36
FB 2924/1,11

CAP AND PLUG EXIST. 36-INCH ø DRAIN FOLLOWING COMPLETION OF DAM BREACH CONSTRUCTION

FOLLOWING COMPLETION OF DAM BREACH CONSTRUCTION SECURE VALVE IN CLOSED POSITION AND CUT AND REMOVE EXIST. CONTROL WHEEL.

DEMO AND REMOVE EXIST. WOODEN PIER AND WOOD RAILING. CUT EXIST. DRAIN LINE UPSTREAM OF EXIST. VALVE. REMOVE EXIST. VALVE.

DEMO AND REMOVE EXIST. INLET GRATE

BENCH MARK
PIPE W/ CAP KOL-2
ELEV=770.84
FB 2924/15

186° 24' 37" 299.94 ("1" cut on rock KOL-4 to Pipe w/cap KOL-1)

12° 21' 20" 501.10 (Pipe w/cap KOL-2 to "1" cut on rock KOL-4)

201° 03' 59" 205.14 (Pipe w/cap KOL-1 to Pipe w/cap KOL-2)

LEGEND:

1980 EXISTING CONTOUR

REMOVE EXISTING STRUCTURES AND APPURTENANCES

GRAPHIC SCALE:

20' 10' 0 20' 40'

SCALE: 1" = 20'

DEMOLITION PLAN

SCALE: 1" = 20'-0"

IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

REVISION NO.	SYM.	DESCRIPTION	SHT.__ OF__	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

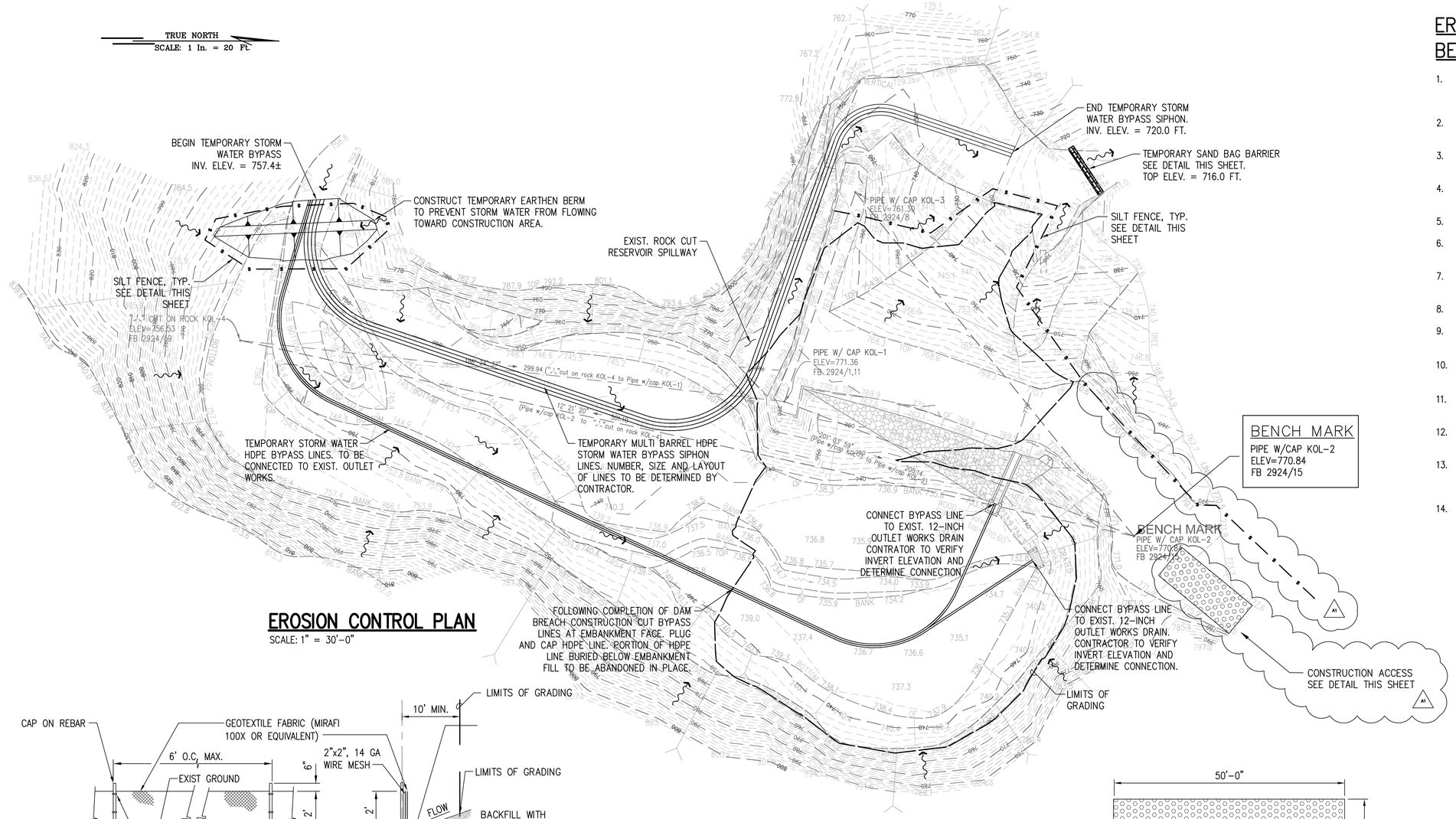
DEMOLITION PLAN

oceanit

DESIGNED BY: AK	CHECKED BY: DE	DAGS JOB NO. 15-23-7409	DRAWING NO. EG-2
DRAWN BY: AK	APPROVED BY:	DATE MAY 2010	SHEET 5 OF 11 SHTS
SCALE: AS NOTED			

DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\05_DEMO_PLAN.DWG EDIT TIME: 05-10-10, 9:45 AM EDITED BY: AKEANE

FILE.....DRAWER.....FOLDER.....



EROSION CONTROL PLAN

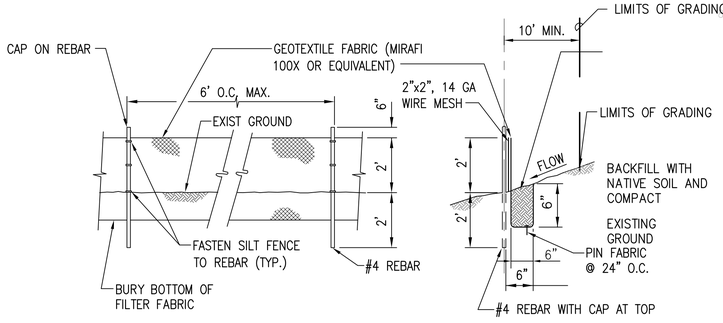
SCALE: 1" = 30'-0"

EROSION CONTROL NOTES AND BEST MANAGEMENT PRACTICES (BMPS):

1. MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY EARTH MOVING WORK IS INITIATED. THESE MEASURES SHALL BE PROPERLY CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
2. LIQUID SOIL STABALIZER SHALL BE DIRTGLUE POLYMER EMULSIONS BY DIRTGLUE ENTERPRISES OR EQUAL.
3. LIQUID SOIL STABILIZATION SHALL BE RE-APPLIED AT THE END OF EACH WORK DAY WHEN SURFACE OF EXISTING SOIL STABILIZER IS DISTURBED.
4. CONSTRUCTION SHALL BE SEQUENCED TO MINIMIZE THE EXPOSURE TIME OF CLEARED SURFACE AREA.
5. ALL CONTROL MEASURES SHALL BE CHECKED AND REPAIRED AS NECESSARY.
6. CONSTRUCT FACILITIES TO RETAIN ON-SITE WASTEWATER SUCH AS CHLORINATED WATER, HYDROSTATIC TESTING WATER, ETC, AND PERCOLATE INTO THE SOIL.
7. MAINTAIN SEDIMENT TRAPS AT DISCHARGE POINTS DURING SITE WORK AND UNTIL PERMANENT EROSION CONTROLS ARE IN PLACE.
8. CONSTRUCT CONSTRUCTION ACCESS FOR EACH INGRESS AND EGRESS.
9. PRE-CONSTRUCTION VEGETATIVE GROUND COVER SHALL NOT BE DESTROYED, REMOVED OR DISTURBED MORE THAN TWENTY (20) CALENDAR DAYS PRIOR TO SITE DISTURBANCE.
10. TEMPORARY SOIL STABILIZATION WITH APPROPRIATE VEGETATION SHALL BE APPLIED ON AREAS THAT WILL REMAIN UNFINISHED FOR MORE THAN THIRTY (30) CALENDAR DAYS.
11. PERMANENT SOIL STABILIZATION WITH PERENNIAL VEGETATION SHALL BE APPLIED AS SOON AS PRACTICAL AFTER FINAL GRADING.
12. STORM WATER FLOWING TOWARD THE CONSTRUCTION AREA SHALL BE DIVERTED BY USING APPROPRIATE CONTROL MEASURES AS PRACTICAL.
13. THE SUGGESTED STORM WATER BYPASSING PLAN IS SCHEMATIC ONLY. THE CONTRACTOR IS WHOLLY RESPONSIBLE FOR THE DETERMINATION OF ADEQUACY, CONSTRUCTION SEQUENCE, AND RELATED BYPASSING REQUIRED FOR CONSTRUCTION OPERATIONS.
14. A TABLE SHOWING ESTIMATED STORM FLOWS FOR DIFFERENT STORM RECURRENCE INTERVALS IS PROVIDED ON THIS SHEET FOR THE CONTRACTOR'S CONVENIENCE IN SIZING OF STORM WATER BYPASS SYSTEM.

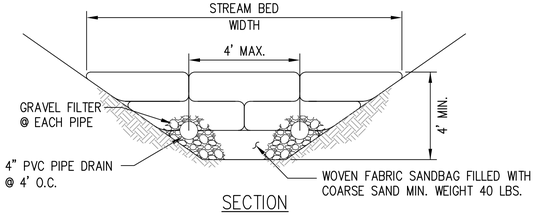
KOLEA RESERVOIR: ESTIMATED STORM FLOWS

RECURRANCE INTERVAL (YEARS)	1-HOUR RAINFALL (INCHES)	KOLEA RESERVOIR BASIN INFLOW (CU. FT./SEC)
100	6.03	1,342
50	5.43	1,194
25	4.83	1,045
10	4.05	853
5	3.48	675
2	2.73	441

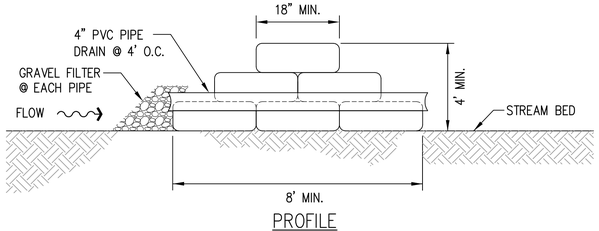


SILT FENCE DETAIL

NOT TO SCALE



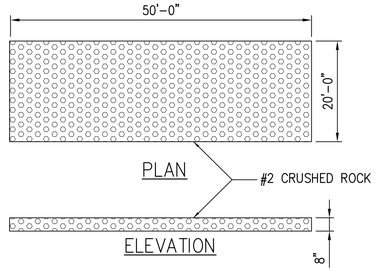
SECTION



PROFILE

SANDBAG BARRIER DETAIL

NOT TO SCALE



CONSTRUCTION ACCESS

NOT TO SCALE

LEGEND:

- 1980' — EXISTING CONTOUR
- LIMITS OF GRADING
- SILT FENCE (TEMPORARY)
- STORM WATER BYPASS SCHEMATIC (TEMPORARY)
- DIRECTION OF SURFACE DRAINAGE
- CONSTRUCTION ACCESS (TEMPORARY)
- SANDBAG BARRIER (TEMPORARY)

GRAPHIC SCALE:

30' 15' 0 30' 60'

SCALE: 1" = 30'

IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR
ADD-1	A1	EXTEND SILT FENCE	1 OF 2	6/09/10	
ADD-1	A1	RELOCATE CONSTRUCTION ACCESS GRAVEL PAD	1 OF 2	6/09/10	

DERRICK C. ELFALAN LICENSED PROFESSIONAL ENGINEER No. 5448-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION, "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

STREAM CHANNEL DIVERSION & EROSION CONTROL PLAN

oceanit

DESIGNED BY:	CHECKED BY:	DAGS JOB NO.	DRAWING NO.
AK	DE	15-23-7409	EC-1
DRAWN BY: AK	APPROVED BY:	DATE: MAY 2010	SHEET 6 OF 11 SHTS
SCALE: AS NOTED			

EARTHWORK SUMMARY:

(FOR GRADING PERMIT PURPOSES ONLY)

TOTAL EARTHWORK (DAM BREACH AND BASIN FILL):

AREA TO BE GRADED:	0.93 ACRE
CUT:	9,599 CY
FILL:	9,077 CY

THE CONTRACTOR SHALL CONDUCT HIS OWN QUANTITY SUMMARY

TRUE NORTH
SCALE: 1 In. = 20 Ft.

STA. 0+2.45
BEGIN BREACH CHANNEL
FG/EG 716.42

FG/EG 718.03

FG/EG 714.85

ROCK RIPRAP (GROUTED) FHWA FP 92 CLASS 4 W/GEOTEXTILE FABRIC.

ARMOR EXIST. STREAM BED WITH ROCK RIPRAP (GROUTED) FHWA FP 92 CLASS 4 W/GEOTEXTILE FABRIC.

LIMITS OF GRADING

FG 732.78
FG/EG 736.54

FG 732.78
FG/EG 735.85

INSTALL EROSION MATTING ALONG ALL EXPOSED 2:1 SLOPES

"J" CBT ON ROCK KOL-4
ELEV=756.53
FB 2924/9

CHECK DAMS IN LOW FLOW CHANNEL OF STREAM (TYP.)

186° 24' 37" → 299.94 ("J" cut on rock KOL-4 to Pipe w/cap KOL-1)

12° 21' 20" ← 501.10 (Pipe w/cap KOL-2 to "J" cut on rock KOL-4)

CHECK DAMS IN LOW FLOW CHANNEL OF STREAM (TYP.)

EXISTING RESERVOIR BASIN TO BE GRASSED EXCEPT ALONG STREAM CHANNEL

℄ BREACH CHANNEL

CHECK DAMS IN LOW FLOW CHANNEL OF STREAM (TYP.)

STA. 2+40
END BREACH CHANNEL
FG = 735.78

FG/EG 748.00

INSTALL EROSION MATTING ALONG ALL EXPOSED 2:1 SLOPES

FG/EG 755.00

UPPER REGION OF EMBANKMENT FILL TO BE GRASSED ALONG ALL EXPOSED 2% SLOPES

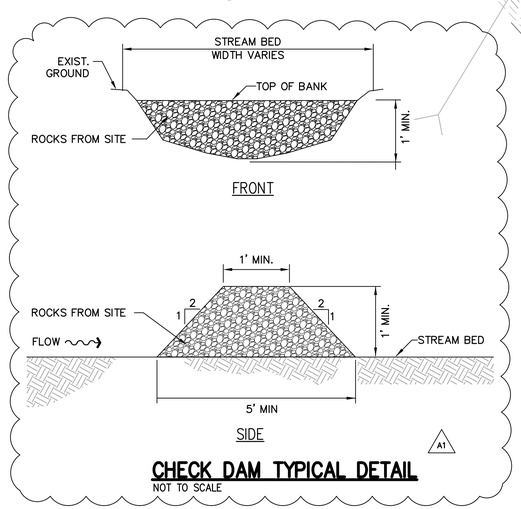
LIMITS OF GRADING

BENCH MARK
PIPE W/CAP KOL-2
ELEV=770.84
FB 2924/15

BENCH MARK
PIPE W/ CAP KOL-2
ELEV=770.84
FB 2924/15

SUMMARY OF PERMANENT EROSION CONTROL MEASURES:

AREA TO BE GRASSED (A1)	60,105 S.F. ~~39,605 S.F.~~
AREA TO BE COVERED BY EROSION MATTING	16,695 S.F.



CHECK DAM TYPICAL DETAIL
NOT TO SCALE

LEGEND:

1980	FINISHED CONTOUR
1980	EXIST. CONTOUR
— — —	LIMITS OF GRADING
----------	GRADE BREAK
Y	CUT/FILL SLOPE

GRAPHIC SCALE:

20' 10' 0 20' 40'

SCALE: 1" = 20'

GRADING PLAN

SCALE: 1" = 20'-0"

IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

REVISION NO.	SYM.	DESCRIPTION	SHT.__ OF__	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR
ADD-1	A1	CHECK DAMS ADDED	2 OF 2	6/10/10	
ADD-1	A1	ADDITIONAL PREMANMENT EROSION CONTROL GRASSED AREA	2 OF 2	6/10/10	

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

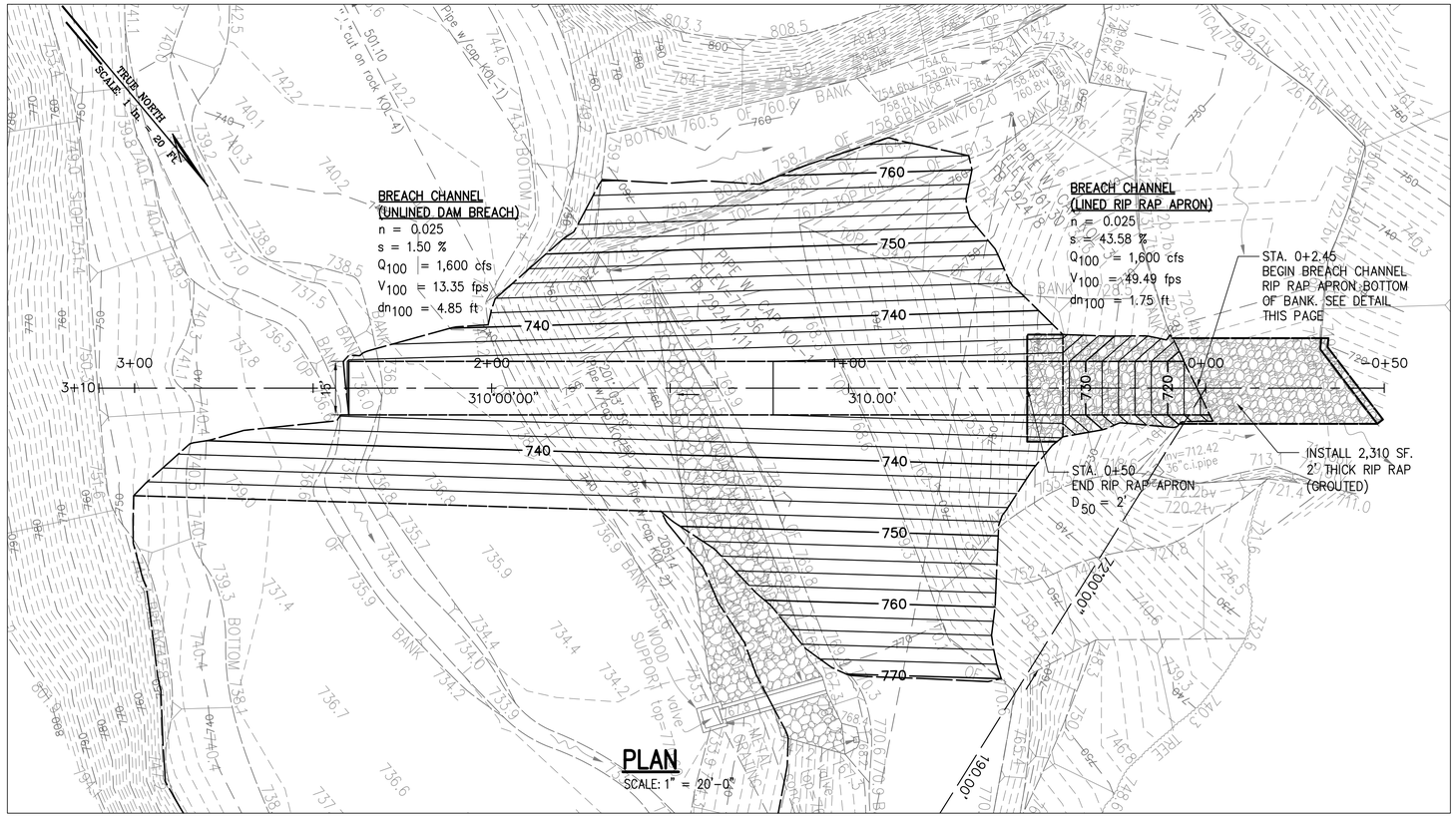
GRADING PLAN

oceanit

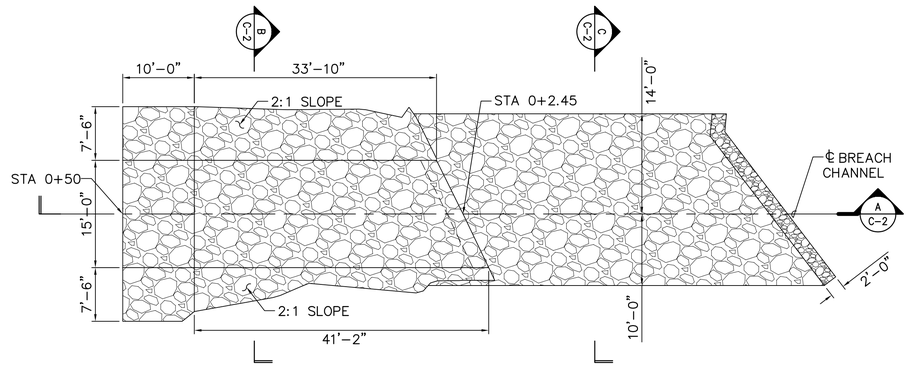
DESIGNED BY:	CHECKED BY:	DAGS JOB NO.	DRAWING NO.
AK	DE	15-23-7409	C-1
DRAWN BY: AK	APPROVED BY:	DATE: MAY 2010	SHEET 7 OF 11 SHTS
SCALE: AS NOTED			

DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\ADDENDUM_1\07_GRADING_PLAN.DWG EDIT TIME: 06-10-10, 8:44 AM EDITED BY: DELFALAN

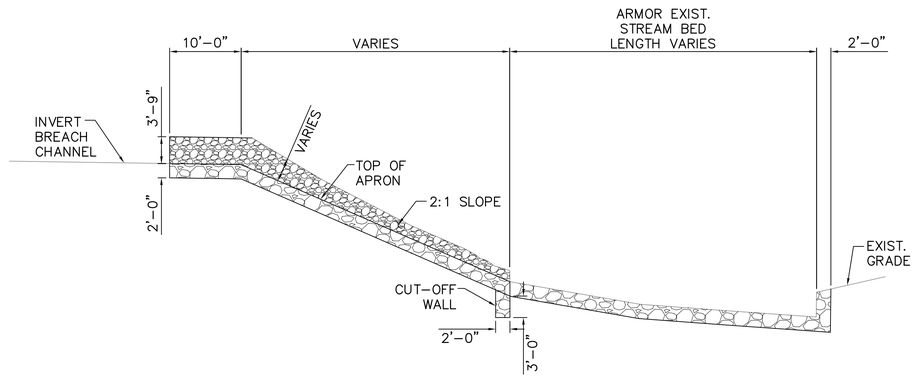
FILE..... DRAWER..... FOLDER.....



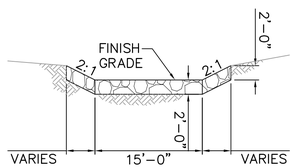
PLAN
SCALE: 1" = 20'-0"



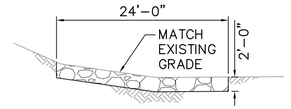
RIP RAP APRON DETAIL
SCALE: 1" = 10'



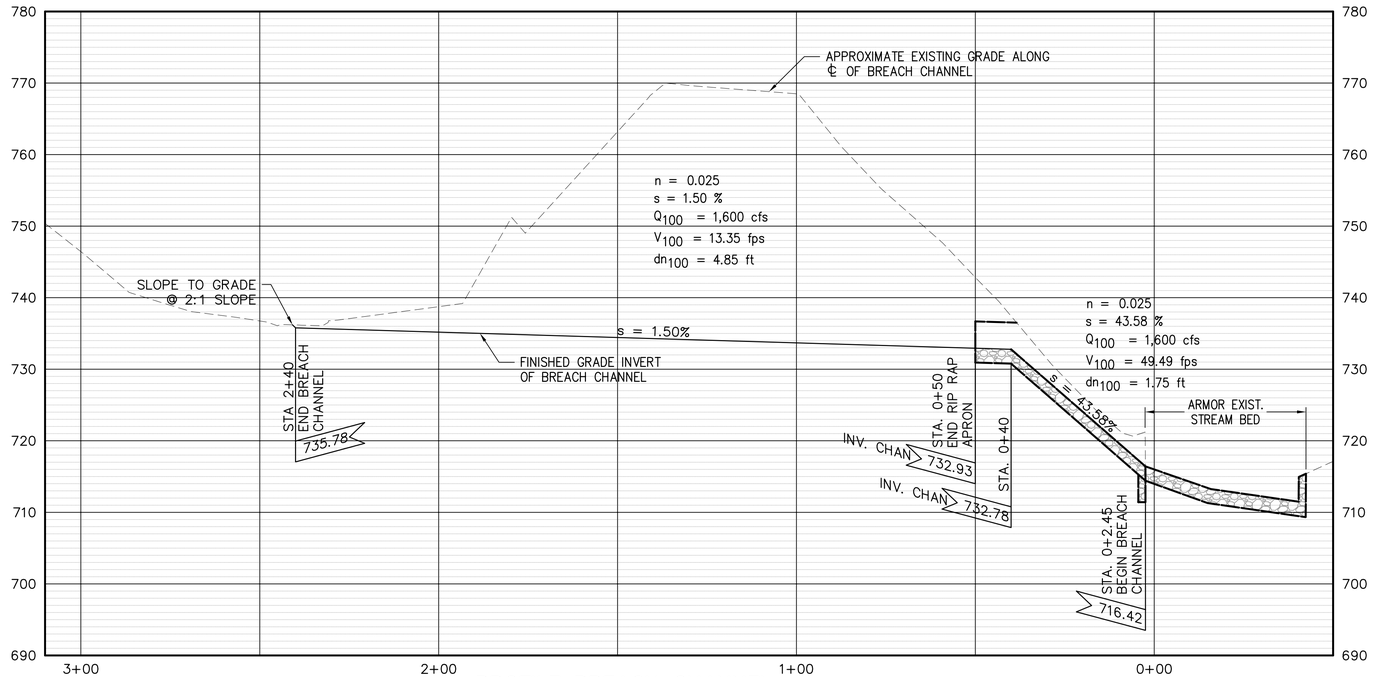
SECTION A



SECTION B



SECTION C



PROFILE BREACH CHANNEL
SCALE: HOR.: 1" = 20'-0"
VER.: 1" = 10'-0"

IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

GRAPHIC SCALE:

20' 10' 0 20' 40'
SCALE: 1" = 20'

10' 5' 0 10' 20'
SCALE: 1" = 10'

REVISION NO.	SYM.	DESCRIPTION	SHT.___ OF___	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

BREACH CHANNEL – PLAN & PROFILE

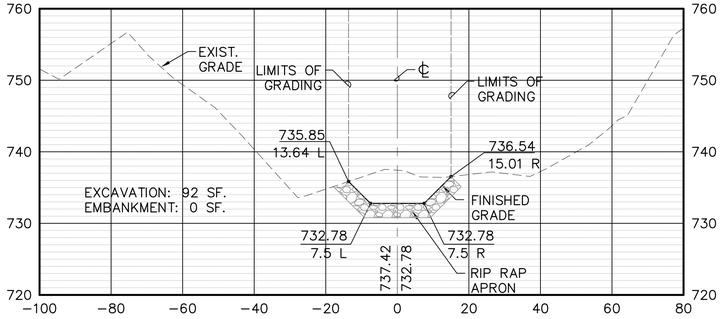
oceanit

DESIGNED BY:	CHECKED BY:	DAGS JOB NO.	DRAWING NO.
AK	DE	15-23-7409	C-2
DRAWN BY: AK	APPROVED BY:	DATE: MAY 2010	SHEET 8 OF 11 SHTS
SCALE: AS NOTED			

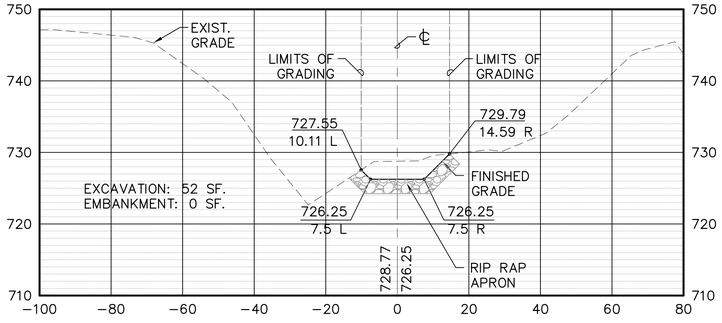
DRAWING NAME: I:\2009\39-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\08_ BREACH_PLAN_PROF.DWG EDIT TIME: 05-10-10, 9:46 AM EDITED BY: AKEANE

FILE..... DRAWER..... FOLDER.....

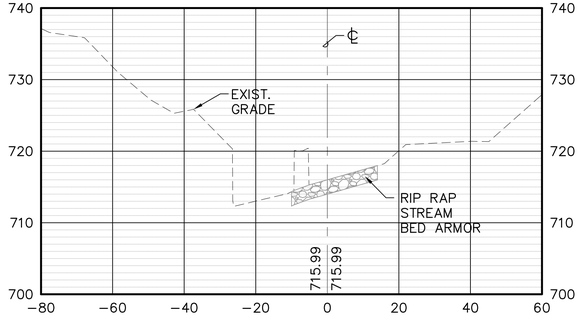
STA. 0+40



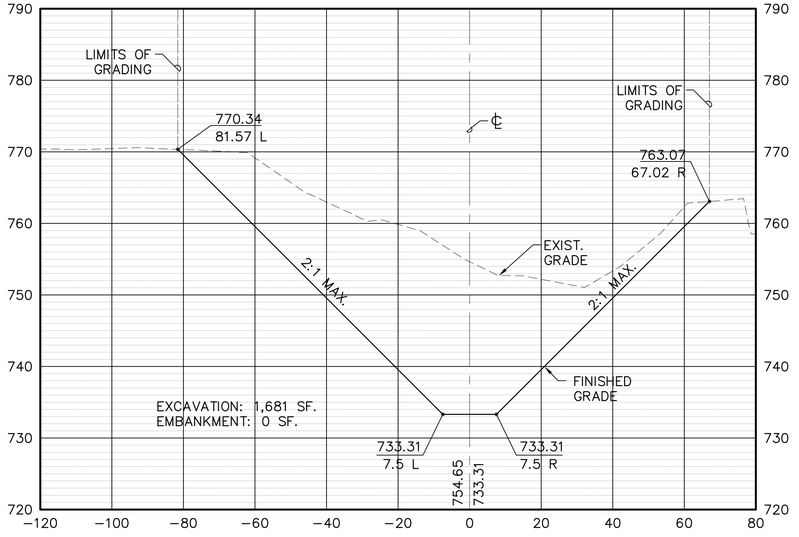
STA. 0+25



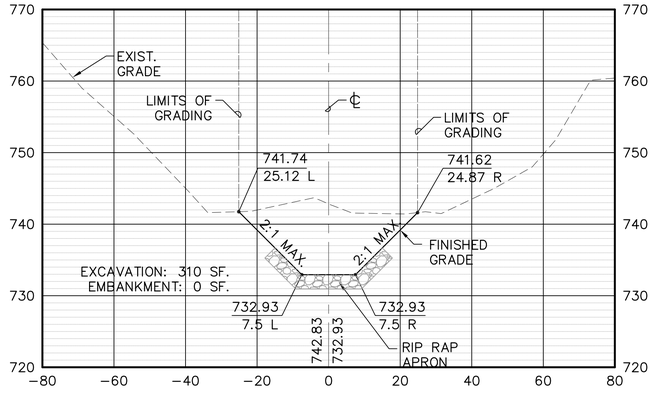
STA. 0+00



STA. 0+75



STA. 0+50



IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

GRAPHIC SCALE:

20' 10' 0 20' 40'

SCALE: 1" = 20'

10' 5' 0 10' 20'

SCALE: 1" = 10'

LEGEND:

- EXISTING GRADE
- FINISHED GRADE
- GROUTED RIP RAP
- ELEVATION ℄ OFFSET — SPOT ELEVATION CALLOUT

BREACH CHANNEL CROSS SECTIONS

SCALE: HOR.: 1" = 20'−0"
VER.: 1" = 10'−0"

REVISION NO.	SYM.	DESCRIPTION	SHT.___ OF___	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

BREACH CHANNEL – CROSS SECTIONS
STA. 0+00 TO 0+75

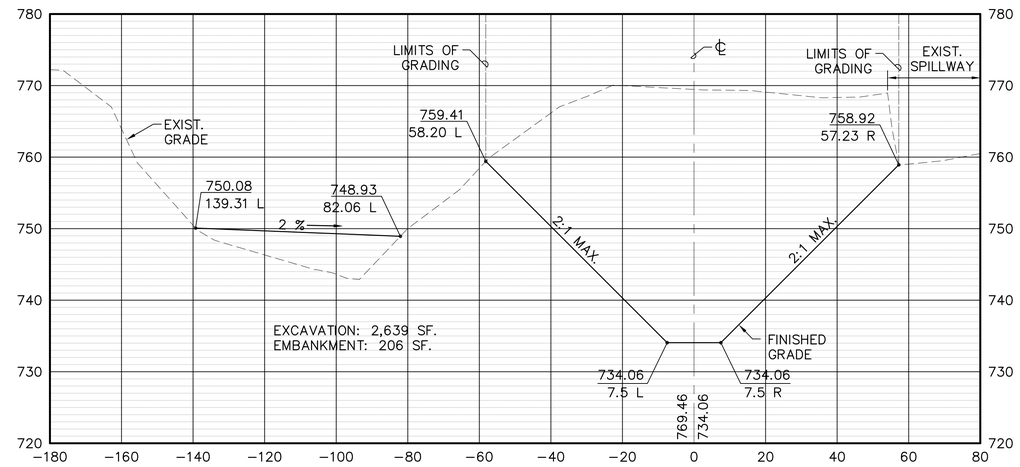
oceanit

DESIGNED BY:	CHECKED BY:	DAGS JOB NO.	DRAWING NO.
AK	DE	15-23-7409	C-3
DRAWN BY:	APPROVED BY:	DATE	SHEET
AK		MAY 2010	9
SCALE: AS NOTED			OF 11 SHTS

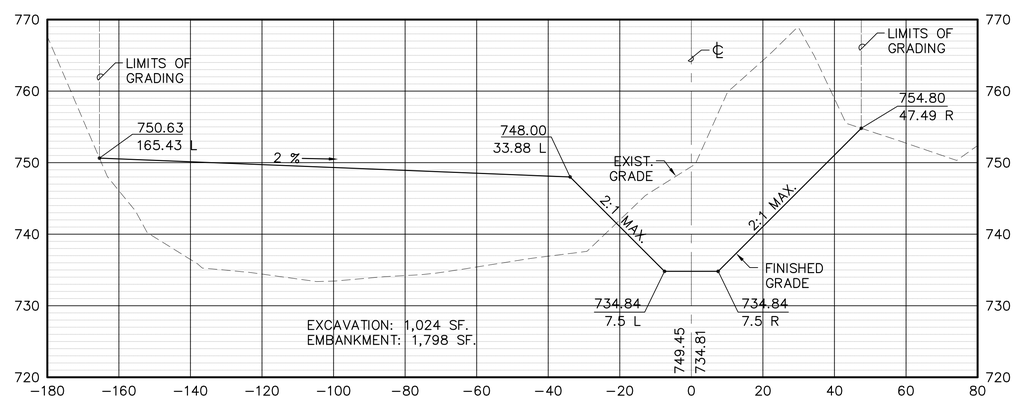
DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\09_SECTIONS.DWG EDIT TIME: 05-10-10, 9:47 AM EDITED BY: AKEANE

FILE..... DRAWER..... FOLDER.....

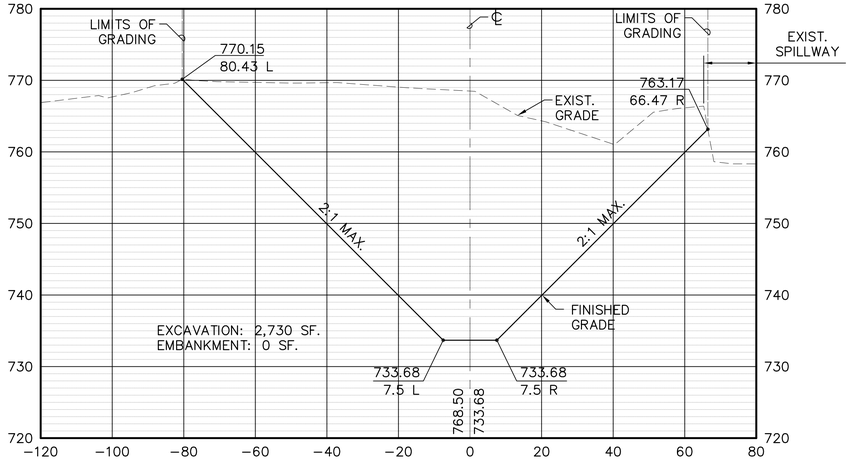
STA. 1+25



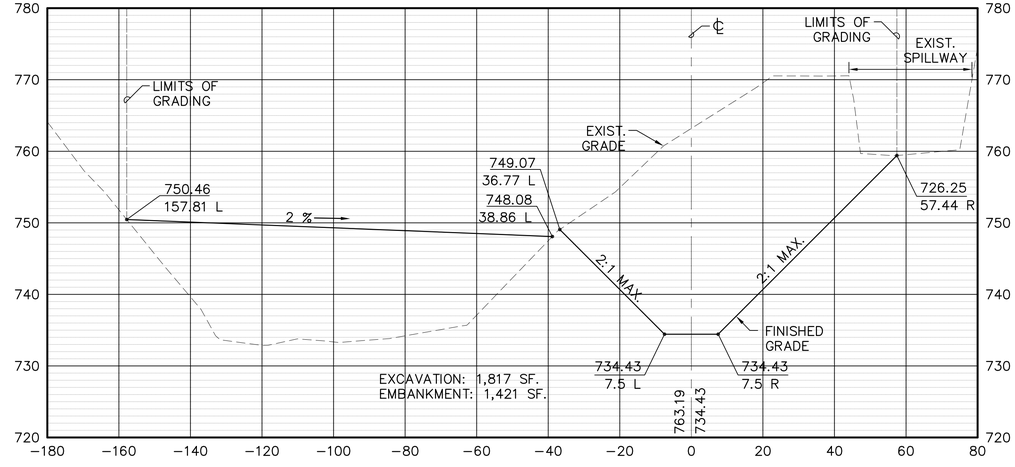
STA. 1+75



STA. 1+00



STA. 1+50



IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

GRAPHIC SCALE:

20' 10' 0 20' 40'

SCALE: 1" = 20'

10' 5' 0 10' 20'

SCALE: 1" = 10'

LEGEND:

EXISTING GRADE

FINISHED GRADE

ELEVATION
℄ OFFSET

SPOT ELEVATION CALLOUT

BREACH CHANNEL CROSS SECTIONS

SCALE: HOR.: 1" = 20'−0"
VER.: 1" = 10'−0"

REVISION NO.	SYM.	DESCRIPTION	SHT.__ OF__	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

BREACH CHANNEL – CROSS SECTIONS
STA. 1+00 TO 1+75

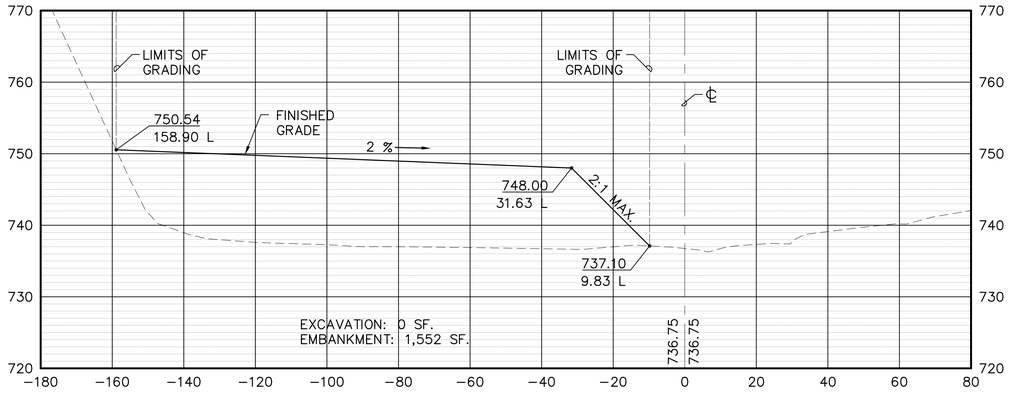
oceanit

DESIGNED BY: AK	CHECKED BY: DE	DAGS JOB NO. 15-23-7409	DRAWING NO. C-4
DRAWN BY: AK	APPROVED BY:	DATE MAY 2010	SHEET 10 OF 11 SHTS
SCALE: AS NOTED			

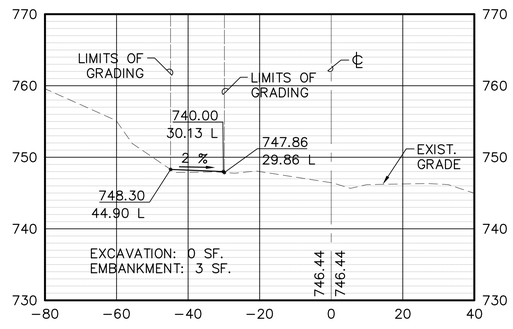
DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\09_SECTIONS.DWG EDIT TIME: 05-10-10, 9:47 AM EDITED BY: AKEANE

FILE..... DRAWER..... FOLDER.....

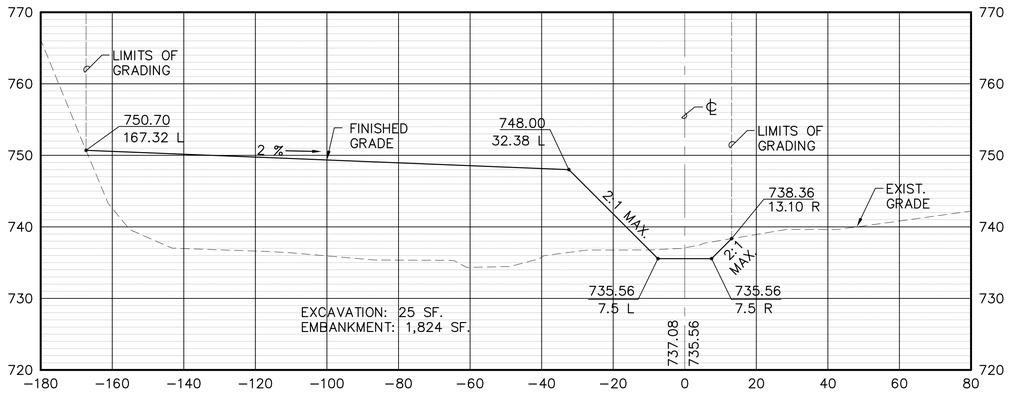
STA. 2+50



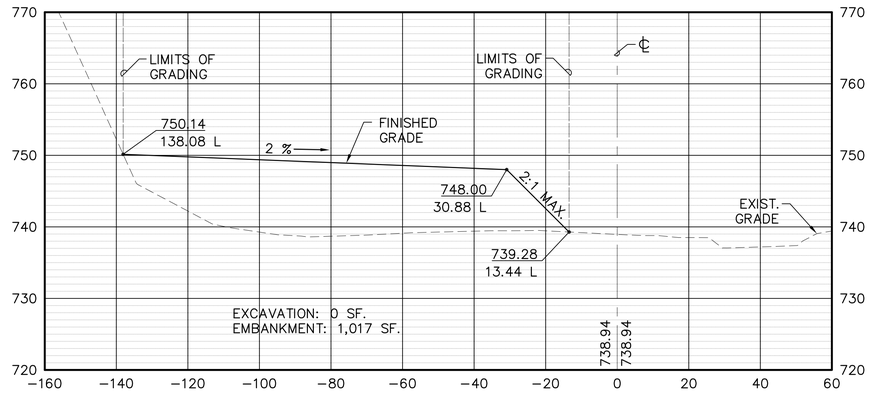
STA. 3+00



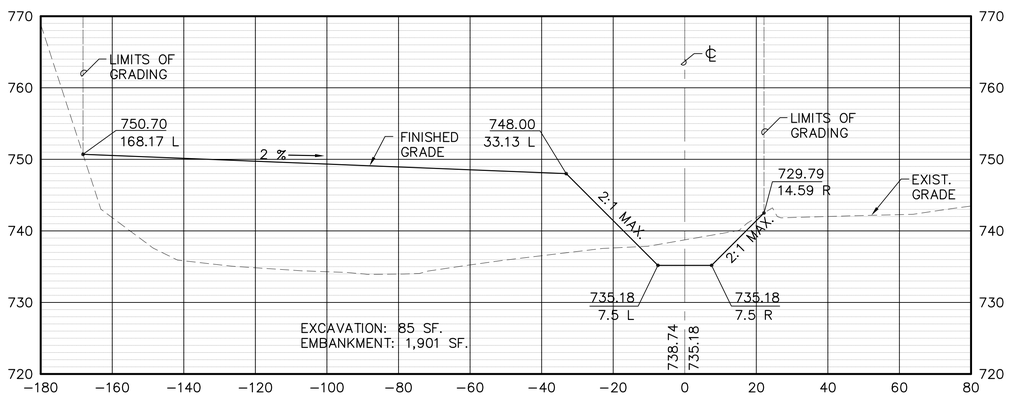
STA. 2+25



STA. 2+75



STA. 2+00



BREACH CHANNEL CROSS SECTIONS

SCALE: HOR.: 1" = 20'-0"
VER.: 1" = 10'-0"

IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

GRAPHIC SCALE:

20' 10' 0 20' 40'
SCALE: 1" = 20'

10' 5' 0 10' 20'
SCALE: 1" = 10'

LEGEND:

- EXISTING GRADE
- FINISHED GRADE
- ELEVATION / ℄ OFFSET
- SPOT ELEVATION CALLOUT

REVISION NO.	SYM.	DESCRIPTION	SHT.___ OF___	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

BREACH CHANNEL – CROSS SECTIONS
STA. 2+00 TO 3+00

oceanit

DESIGNED BY: AK	CHECKED BY: DE	DAGS JOB NO. 15-23-7409	DRAWING NO. C-5
DRAWN BY: AK	APPROVED BY:	DATE MAY 2010	SHEET 11 OF 11 SHTS
SCALE: AS NOTED			

DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\09_SECTIONS.DWG EDIT TIME: 05-10-10, 9:48 AM EDITED BY: AKEANE

FILE..... DRAWER..... FOLDER.....

APPENDIX G

Comments Received during the pre-consultation period

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF:

June 8, 2010

Regulatory Branch

DA File No.: POH-2010-00112

Ms. Joanne Hiramatsu
Manager, Environmental Engineering & Planning
Oceanit
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

Dear Ms. Hiramatsu:

This letter is in response to your request, dated May 3, 2010, for consultation comments for preparation of an Environmental Assessment (EA) for the proposed decommissioning and removal of the Kolea Dam and restoration of the stream to its natural state. You also requested a determination of any required Department of the Army (DA) permits. The project is located on the Kolea Stream near Keanae, Island of Maui, Hawaii (TMK: (2) 1-1-001:050). We have determined the potential project site contains waters under the regulatory jurisdiction of the Corps of Engineers.

Your proposed project was reviewed pursuant to Section 10 of the Rivers and Harbors Act of 1899 (Section 10) and Section 404 of the Clean Water Act (Section 404). Section 10 requires that a DA permit be obtained for certain structures or work in or affecting navigable waters of the United States (U.S.), prior to conducting the work (33 U.S.C. 403). Section 404 requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including wetlands, prior to conducting the work (33 U.S.C. 1344). For regulatory purposes, the U.S. Army Corps of Engineers (Corps) defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Section 404 regulates discharges of dredged material incidental to certain activities such as grading, mechanized land clearing, ditching or other excavation activity, and the installation of certain pile-supported structures.

While we have determined that the Kolea Stream at this location is not considered a navigable water of the U.S., we have determined that the grading and placement of riprap as part of this project will require a permit under Section 404. Our assertion of jurisdiction is based on our documentation that the waterbody in question is a water of the U.S. and recognition that the use, degradation, or destruction of this waterbody could affect interstate commerce.

We recommend your EA provide a detailed description of all ground-disturbing activities associated with the project construction occurring on and in the immediate vicinity of the project site; identify all streams (perennial, intermittent, or ephemeral) and wetlands on and in the immediate vicinity of the proposed project site; characterize the hydrology and ecology of those features; and provide a cross-section of the proposed work and the existing conditions at the

proposed project location. Your EA should include Best Management Practices proposed to mitigate the negative impacts to any aquatic environment and a thorough discussion of project alternatives that were considered, including those that may avoid any discharges into any water of the U.S.

This letter contains an approved JD for the property in question and is valid for a period of five (5) years unless new information warrants revision of the determination before the expiration date. If you object to this determination, you may request an Administrative Appeal under Corps regulations at 33 Code of Federal Regulations (CFR) Part 331. We have enclosed a Notification of Appeal Process and Request For Appeal (NAP/RFA) form. If you request to appeal this determination you must submit a completed RFA form, according to instructions in the RFA, to the Corps' Pacific Ocean Division office at the following address:

Thom Lichte, Appeals Review Officer
U.S. Army Corps of Engineers
Pacific Ocean Division, ATTN: CEPOD-PDC
Building 525
Fort Shafter, HI 96858-5440

Thank you for giving us the opportunity to review this proposal and for your cooperation with our regulatory program. Please be advised you can provide comments on your experience with the Honolulu District Regulatory Branch by accessing our web-based customer survey form at http://per2.nwp.usace.army.mil/survey.html.

Should you have any questions, please contact Mr. Robert Deroche of this office at the above address or telephone 808-438-2039 or by E-Mail at robert.d.deroche2@usace.army.mil. Please refer to File Number POH-2010-00112 in all future communications with this office regarding this or other projects at this location.

Sincerely,

George P. Young, P.E.
Chief, Regulatory Branch

Enclosures

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): June 8, 2010

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CEPOH-EC-R Kolea Dam Decommissioning 2010-00112

C. PROJECT LOCATION AND BACKGROUND INFORMATION: Kolea Stream
State: Hawaii County/parish/borough: Maui City: Near Keanae
Center coordinates of site (lat/long in degree decimal format): Lat. 20.87261° N, Long. 156.18949° W.
Universal Transverse Mercator: 4
Name of nearest waterbody: Kolea Stream
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Pacific Ocean
Name of watershed or Hydrologic Unit Code (HUC): 20020000
☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☒ Office (Desk) Determination. Date: June 8, 2010
☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]
☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** *"waters of the U.S."* within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☒ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: linear feet: width (ft) and/or 1.2 acres.
      Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **Not established at this time.**
      Elevation of established OHWM (if known):

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain:

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW:

   Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) General Area Conditions:
   Watershed size: 0.6**square miles**
   Drainage area: 0.6 **square miles**
   Average annual rainfall: 150 inches
   Average annual snowfall: 0.0 inches

   (ii) Physical Characteristics:
   (a) Relationship with TNW:
   ☒ Tributary flows directly into TNW.
   ☐ Tributary flows through **Pick List** tributaries before entering TNW.

   Project waters are **1 (or less)** river miles from TNW.
   Project waters are **1-2** river miles from RPW.
   Project waters are **1 (or less)** aerial (straight) miles from TNW.
   Project waters are **1 (or less)** aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain:

   Identify flow route to TNW[5]: Kolea Stream flows directly into the Pacific Ocean.
   Tributary stream order, if known:

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☒ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: Omao Reservoir was built on Omao Stream. There is an aquaduct that maintains flow to downstream .

Tributary properties with respect to top of bank (estimate):
Average width: 30 feet
Average depth: 10 feet
Average side slopes: **2:1.**

Primary tributary substrate composition (check all that apply):

☐ Silts	☐ Sands	☐ Concrete
☐ Cobbles	☐ Gravel	☐ Muck
☒ Bedrock	☐ Vegetation. Type/% cover: 75 grasses and shrubs	
☐ Other. Explain: .		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: From applicant pictures, it appears stable.
Presence of run/riffle/pool complexes. Explain: Many. Stream is very dynamic at this location.
Tributary geometry: **Meandering**
Tributary gradient (approximate average slope): 1.5 %

(c) Flow:

Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):

☐ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☐ destruction of terrestrial vegetation
☐ shelving	☐ the presence of wrack line
☐ vegetation matted down, bent, or absent	☐ sediment sorting
☐ leaf litter disturbed or washed away	☐ scour
☐ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	

☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☒ High Tide Line indicated by:	☒ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

---

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width): .
- ☐ Wetland fringe. Characteristics: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain: .

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: Pick List. Explain: .

Surface flow is: Pick List

Characteristics: .

Subsurface flow: Pick List. Explain findings: .

- ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are Pick List river miles from TNW.

Project waters are Pick List aerial (straight) miles from TNW.

Flow is from: Pick List.

Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☒ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Atlas of Hawaiian Watersheds & Their Aquatic Resources lists stream as perrenial.
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
  Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):
   - ☐ Tributary waters: linear feet width (ft).
   - ☐ Other non-wetland waters: acres.
     Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
   ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
   - ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
   - ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
   - ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
- ☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- ☐ which are or could be used for industrial purposes by industries in interstate commerce.
- ☐ Interstate isolated waters. Explain: .
- ☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

---

[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] **Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.***

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

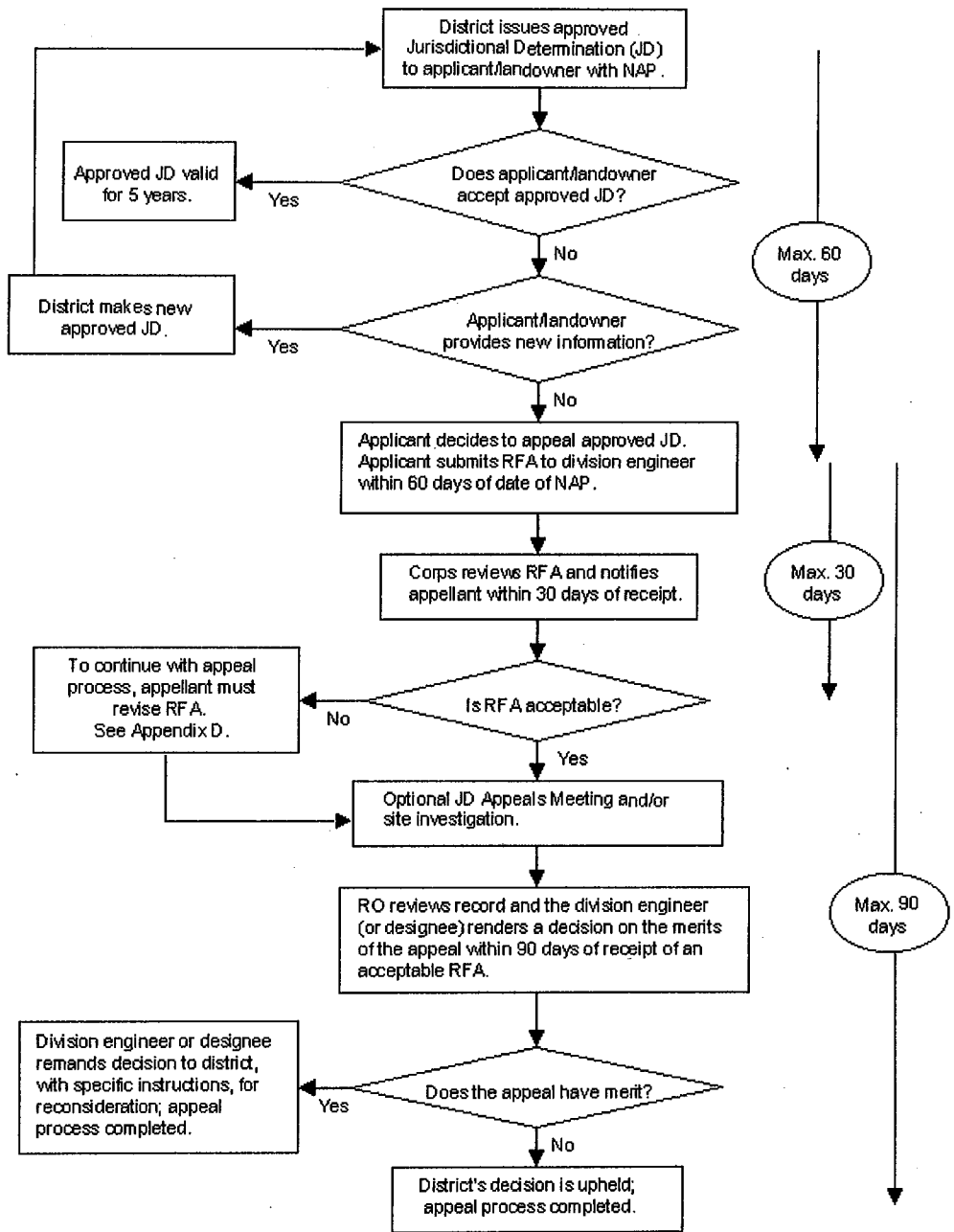
Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☒ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☒ USGS 8 and 12 digit HUC maps.
☒ U.S. Geological Survey map(s). Cite scale & quad name:1:24K CA-SAUNDERS REEF.
☐ USDA Natural Resources Conservation Service Soil Survey. Citation: .
☐ National wetlands inventory map(s). Cite name: .
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date): Google 2009 Digital Globe.
or ☒ Other (Name & Date): applicant provided ground photographs under cover letter dated May 3, 2010.
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

Administrative Appeal Process for Approved Jurisdictional Determinations



Appendix C

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL		
Applicant: State Department of Accounting and General Services - Hawaii	File Number: POH-2010-00112	Date: June 8, 2010
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
XX	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Robert D. Deroche U.S. Army Corps of Engineers Honolulu District, ATTN: CEPOH-EC-R Building 230 Fort Shafter, HI 96858-5440 Tel. (808) 438-2039	Thom Lichte, Appeal Review Officer Pacific Ocean Division ATTN: CEPOD-PDC Building 525 Fort Shafter, HI 96858-5440 Tel. (808) 438-0397

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

CHARMAINE TAVARES
Mayor

MILTON M. ARAKAWA, A.I.C.P.
Director

MICHAEL M. MIYAMOTO
Deputy Director

RALPH M. NAGAMINE, L.S., P.E.
Development Services Administration

CARY YAMASHITA, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
DEVELOPMENT SERVICES ADMINISTRATION
250 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

May 20, 2010

Joanne Hiramatsu, Manager
Environmental Engineering & Planning
OCEANIT
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

Subject: CONSULT FOR ENVIRONMENTAL ASSESSMENT FOR REMOVAL OF KOLEA RESERVOIR
TMK (2) 1-1-001:050

Dear Ms. Hiramatsu:

We reviewed the subject application and have no comments at this time.

Please call Michael Miyamoto at 270-7845 if you have any questions regarding this letter.

Sincerely,

Milton M. Arakawa, A.I.C.P.
Director of Public Works

ls S:\LUCA\CZM\kolea_dam_ea_11001050_ls.wpd
xc: Highways Division
Engineering Division

CHARMAINE TAVARES
Mayor
KATHLEEN ROSS AOKI
Director
ANN T. CUA
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PLANNING

May 28, 2010

Joanne Hiramatsu
Oceanit Center
828 Fort Street Mall, Suite 600
Honolulu, HI 96813

Dear Ms. Hiramatsu:

SUBJECT: PRE-CONSULTATION FOR DAGS KOLEA RESRVOIR AND DAM REMOVAL PROJECT, LOCATED AT KOLEA, HANA, MAUI, TMK: (2) 1-1-001:050, (RFC 2010/0064)

The Department of Planning (Department) is in receipt of your May 19, 2010 request to comment on Kolea Dam (HI 0097) Reservoir removal. The project is subject to the Coastal Zone Management Act and HRS 205A must be observed. That said we are not aware of any additional permits applicable to this project as this TMK is not located with the Special Management Area (SMA). However, we would like the opportunity to comment on the Environmental Assessment Draft when available.

Thank you for your cooperation. If additional clarification is required, please contact Staff Planner Anna Benesovska by email at anna.benesovska@mauicounty.gov or by telephone at (808) 463-3867.

Sincerely,

CLAYTON I. YOSHIDA, AICP
Planning Program Administrator

For: KATHLEEN ROSS AOKI
Planning Director

xc: Anna Benesovska, Staff Planner
General File
Project File

KRA:CIY:ANB:xxxx
K:\WP_DOCS\PLANNING\RFC\2010\0064_Kolea_Dam_Reservoir_Removal\Kolea_Dam_Reservoir_Removal.doc

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
PEARL IMADA IBOSHI
DEPUTY DIRECTOR
ABBEY SETH MAYER
DIRECTOR
OFFICE OF PLANNING

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING
235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-13024

May 28, 2010

Ms. Joanne Hiramatsu, Manager
Environmental Engineering & Planning
Oceanit
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

Dear Ms. Hiramatsu:

Subject: Hawaii Coastal Zone Management (CZM) Program Federal Consistency Requirements for Removal of Kolea Dam (HI 00097) and Reservoir, Maui; TMK (2) 1-1-1: 50

The proposed removal of Kolea Dam and Reservoir may be subject to a CZM federal consistency review if a Department of the Army Permit is required from the U.S. Army Corps of Engineers. If the Corps permit is required, the CZM Program should be consulted prior to submitting the CZM federal consistency application to determine the applicable requirements.

Potential areas of CZM interest are: construction related impacts to the water quality of both the stream and the ocean receiving waters; impacts to aquatic resources; and effects of the proposed riprap on stream flow and stream biology. Additional areas of interest may become relevant during the CZM federal consistency review.

Information about the CZM federal consistency review, application instructions, application form, and assessment form are available at the Hawaii CZM Program web site: http://www.hawaii.gov/dbedt/czm/, in the "Federal Consistency" section. The CZM federal consistency review involves publishing a public notice in the State Office of Environmental Quality Control's bulletin, *The Environmental Notice*, and providing a public review and comment period. If you have any questions, please call John Nakagawa of our CZM Program at 587-2878.

Sincerely,

Mary Lou Kobayashi for

Abbey Seth Mayer
Director

c: U.S. Army Corps of Engineers, Regulatory Branch
Department of Planning, County of Maui

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

June 7, 2010

Ref.: RFD.2663.6

Ms. Joanne Hiramatsu
Oceanit
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

Dear Ms. Hiramatsu:

Pre-Consultation for DAGS Kolea Reservoir and Dam Removal Project
Kolea Stream, Island of Maui
TMK: (2) 1-1-001:050

Reference is made to a response letter to you from the Department of Land and Natural Resources' Office of Conservation and Coastal Lands, dated May 18, 2010, requesting pre-consultation comments concerning the DAGS Kolea Reservoir and Dam Removal Project.

The Commission on Water Resource Management (Commission), Stream Protection and Management Branch, has the responsibility to protect stream channels from alteration whenever practicable to provide for fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses in the State of Hawaii under the authorization of the State Water Code (Code), Chapter 174C, Hawaii Revised Statutes, and Chapter 13-169, Hawaii Administrative Rules (Protection of Instream Uses of Water).

Pursuant to the Code, §174C-93, "No person shall construct or alter a stream diversion works, other than in the course of normal maintenance, without first obtaining a permit from the commission." The term "stream diversion works" is defined in the Code, "means any artificial or natural structure emplaced within the stream for the purpose of diverting stream water." Furthermore, the Code defines "stream" as any "natural watercourse in which water usually flows in a defined bed or channel."

Based on the information contained therein and because Kolea Reservoir was registered as a stream diversion work (*REG.231.6*) by East Maui Irrigation Company, the Commission shall require a Stream Diversion Works Abandonment Permit for the proposed project. Work performed without appropriate permits or authorizations may be subject to fines and/or remedial actions.

Please be advised that the project may require other agency approvals regarding wetlands, water quality, grading, stockpiling, and floodways. This letter should not be used for other regulatory jurisdictions or used to imply compliance with other federal, state, or county rules.

Enclosed is a Stream Channel Alteration Permit Application Form. Additional forms may be picked up at our office or downloaded from our website at: http://www.hawaii.gov/dlnr/cwrm/forms.htm

Should you have any questions, please contact Robert Chong of the Stream Protection and Management Branch at (808) 587-0266, or toll free from the Big Island at 974-4000, extension 70266, or robert.k.chong@ hawaii.gov.

Sincerely,

for KEN C. KAWAHARA, P.E.
Deputy Director

c: Office of Conservation and Coastal Lands
Engineering Division

LINDA LINGLE
GOVERNOR OF HAWAII

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

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

In reply, please refer to:
DOH/CWB

05080CEC.10

May 28, 2010

Ms. Joanne Hiramatsu
Manager
Environmental Engineering & Planning
Oceanit
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

Dear Ms. Hiramatsu:

SUBJECT: DLNR Dams and Reservoirs on Maui
Kolea Dam (HI 00097) Reservoir
TMK: [2] 1-1-001:050
Consultation for Environmental Assessment (EA)

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated May 10, 2010, requesting early consultation comments for the subject project. The CWB has reviewed the subject document and offers these comments on your project. Please note that our review is based solely on the information provided in the subject document and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf.

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

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

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

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

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

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

b. Discharges of construction dewatering effluent.

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

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

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

Sincerely,

ALEC WONG, P.E., CHIEF
Clean Water Branch

EC:ml

c: DOH-EPO #I-3180 [via email only]

LINDA LINGLE
GOVERNOR OF HAWAII

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

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

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

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

REF:OCCL:AB

Correspondence MA-10-229

MAY 18 2010

Joanne Hiramatsu
Oceanit
828 Fort Street Mall, Suite 600
Honolulu, Hawai'i 96813

SUBJECT: Pre-Consultation for DAGS Kolea Reservoir and Dam Removal Project, Located at Kolea, Hāna, Maui, TMK: (2) 1-1-001:050

Dear Ms. Hiramatsu:

The Department of Land and Natural Resources (DLNR) Office of Conservation and Coastal Lands (OCCL) is in receipt of your letter requesting pre-consultation comments on the State Department of Accounting and General Services (DAGS) Kolea Reservoir and Dam removal project, located at Kolea, Hāna, Maui, TMK: (2) 1-1-001:050.

According to the information you provided, the dam was constructed in 1901 in the path of the existing stream. The project entails breaching the dam and restoring the stream to a more natural condition. During construction, the existing spillway will be used to divert flows away from the construction site. Water from the project will enter the existing stream at the same location of the existing spillway via a riprap.

According to our records, there has been no previous Conservation District Use Application (CDUA) filed for the subject parcel. The subject parcel is located within the State Land Use Conservation District, Protective and Resource Subzones. The removal of the reservoir and dam is identified land use in the Conservation District pursuant to Hawai'i Administrative Rules (HAR) §13-5-22 *Identified Land Uses in the Protective Subzone*, P-9 STRUCTURES, EXISTING, (C-1) *Demolition, removal, or alteration of existing structures, facilities, and equipment. Any historic property shall be evaluated by the department for historical significance.*

The project would require filing a CDUA for a Departmental permit. If the project site is not considered a historic property, the project may be exempt from an Environmental Assessment (EA) pursuant to HAR §11-200-8(a)(8).

Should you have any questions regarding this correspondence, please contact Audrey Barker of our office at (808) 587-0316 or audrey.t.barker@hawaii.gov.

Sincerely,

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

C: Chairperson
MDLO/DOFAW/SHPD/DAR/CWRM
Maui Planning Department

PHONE (808) 594-1888

FAX (808) 594-1865

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

HRD10/4993

May 25, 2010

Oceanit
Attention: Joanne Hiramatsu, Manager
828 Fort Street Mall, Suite 600
Honolulu, Hawai'i 96813

Re: Consultation for Environmental Assessment for Removal of the Kolea Dam (HI 00097) Reservoir, Makuīwa Ahupua'a, Maui, TMK No. (2) 1-1-001:050

Aloha e Joanne Hiramatsu:

The Office of Hawaiian Affairs (OHA) is in receipt of your May 3, 2010 request for consultation and comments ahead of the draft environmental assessment (EA) on the above-referenced project. We thank you for the opportunity to provide input.

OHA understands that the State of Hawai'i Department of Accounting and General Services (DAGS) plans to remove the Kolea Dam and Reservoir in the ahupua'a of Makuīwa on the island of Maui. The dam, originally constructed in 1901, will be breached in order to restore stream flow to a more natural condition. The project site is located within the State Conservation district and is designated as Conservation in the County of Maui Community Plan. In February 2010, Cultural Surveys Hawaii conducted an Archeological Inventory Survey of the project area.

In response to your inquiry, OHA does not require any permits for the project and does not have comments at this stage of the planning process. Nonetheless, we rely on the proposing agency to obtain all necessary permits from other State and Federal agencies. We also look forward to reviewing and providing comments on the draft EA for this project. OHA supports DAGS's effort to restore instream flow, which in turn, supports traditional and customary Native Hawaiian rights and practices.

Should you have any questions, please contact Everett Ohta at 594-0231 or by email at everetto@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Chief Executive Officer

From: Paula_Levin@fws.gov
Sent: Monday, May 24, 2010 1:07 PM
To: Joanne Hiramatsu
Cc: Gordon_Smith@fws.gov; Jennifer_Higashino@fws.gov; Craig_Rowland@fws.gov; Dan_Polhemus@fws.gov
Subject: Kolea Stream

Joanne Hiramatsu, Manager, Environmental Engineering and Planning Oceanit, Inc.

Dear Joanne:

This is in response to your May 6, 2010 correspondence regarding the restoration of Kolea Stream via removal of the Kolea Reservoir Dam on Maui. Your early inquiry requested us to provide review, comments and concerns regarding information to include in the Environmental Assessment (EA) for this project and identification of permit compliance needs.

I am providing comments below regarding information to include in your EA and other environmental compliance, and I recommend you contact two of our biologists regarding habitat restoration technical assistance and possible partnership on this proposal:

Gordon Smith, Fish Habitat Partnership Coordinator; 808-792-9400 (Fish and stream species, aquatic habitat) Jennifer Higashino, Maui Nui Conservation Partnerships Biologist, 371-3284.
(Birds, plants, riparian, wetland, other habitat)

Aquatic Environment concerns that should be addressed in EA:

We recommend for your environmental assessment that you address compliance with Section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531 et.seq .), as amended (ESA). We recommend that you request a list of threatened and endangered species in the area to ensure that impacts to species will be avoided. The project may be within proximity to important habitat for recovery of endangered Hawaiian waterbirds, damselflies, other invertebrates, and plants. It is important to evaluate potential impacts of the project on these species, whether beneficial or detrimental.

Native stream species: Please provide any available survey data regarding the historical or current presence of native stream species. If no data are available, we can assist you in identifying appropriate survey methods or data needs, and possibly assist you in the stream or riparian habitat surveys.

Native riparian and aquatic plant species: Will the stream be reconnected to its historic floodplain and will there be any potential effects on populations of native vegetation or endangered plants or habitat in the construction area, in the potentially restored stream, or in the lowered reservoir area?

If there are invasive aquatic/stream species limited to below the dam (which could be a barrier to the passage of native stream species),the project should be designed to not allow the access or spread of these species upstream after the removal of the barrier. It is also important to determine if a survey is needed for invasive species.

Additionally, consistent with NOAA's stated concerns, USFWS also would like to see additional information regarding evaluation of impacts to the marine environment:

1. Does this design involve minimal hard structures (channel bed and bank armoring) and does it retain to the greatest extent, the natural

characteristics of the stream bed and banks?

2. Please quantify potential impacts, i.e. if/how the preferred alternative (both during construction and after) would lead to increased sediment/pollution loading in the stream and thus discharge in to the nearshore marine environment.

3. Please describe what fish and marine benthic resources (coral, seagrass, soft sediment,algae,macro-invertebrates) are found at and adjacent to the mouth of the stream in the nearshore environment. These species could be impacted by sediment loading resulting from the project construction. If available, please provide any existing marine assessment or survey data on this area. If there are no data available, a survey may be needed to adequately evaluate impacts of the project.

4. describe the avoidance and minimization measures, or best management practices, that will be implemented to reduce and limit sediment/pollution input to the stream and nearshore environment.

We appreciate your interest in natural resource conservation and your providing us with the opportunity for early review and comment on your proposal. Please contact Gordon Smith and Jennifer Higashino regarding habitat restoration technical assistance, at the phone numbers provided above, or contact me regarding additional NEPA or ESA concerns if you have any questions.

Paula Levin
USFWS Pacific Islands
Coastal Conservation
(808)792-9417

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

DATE: June 7, 2010

LOG 2010.1944
DOC: 1006RS17

TO: Joanne Hiramatsu
Manager, Environmental Engineering and Planning
Oceanit
828 Fort Street Mall, Unit 600
Honolulu, HI 96813

SUBJECT: **Chapter 6E-8 Review / Consultation for Environmental Assessment (EA) DLNR Dams and Reservoirs on Maui**
Permit: (None)
Owner: State of Hawaii
Location: Kolea Dam (HI 00097) Reservoir
Tax Map Key: (2) 1-1-001:050

This letter is in response to your communication of May 3, 2010, received by our office on May 6, 2010, re the proposed demolition of the Kolea Dam and restoration of the natural stream bed on Maui. The area of potential effect would be the streambed in immediate vicinity of the dam.

The dam was constructed in 1901 for water storage necessary for agricultural operations. As such it is eligible for the Hawaii and National Registers of Historic Places under Criteria A (events) and C (design), exemplifying the rise of commercial agricultural production in Hawaii and its impact on landscape, economics, society, and politics.

We find that the project will have effect, with proposed mitigation. An archaeological Inventory Study conducted by Cultural Surveys Hawaii in February 2010 recommended that a Historic American Engineering (HAER) report be submitted for the site. We agree with this assessment and also feel that the project warrants an Architectural Inventory Survey Report.

Any questions should be addressed to Ross W. Stephenson, SHPD Historian, at 692-8028 or ross.w.stephenson@hawaii.gov.

Mahalo for the opportunity to comment.

Pua Aiu, Administrator, Hawaii Historic Preservation Division, DLNR

Date 6/10/10

In the event that historic resources, including human skeletal remains, lava tubes, and lava blisters/bubbles are identified during construction activities, all work should cease in the immediate vicinity of the find, the find should be protected from additional disturbance, and the State Historic Preservation Division should be contacted immediately at (808) 692-8015.

APPENDIX H:

Kolea Stream Assessment, Oceanit 2011

oceanit
innovation through engineering & scientific excellence

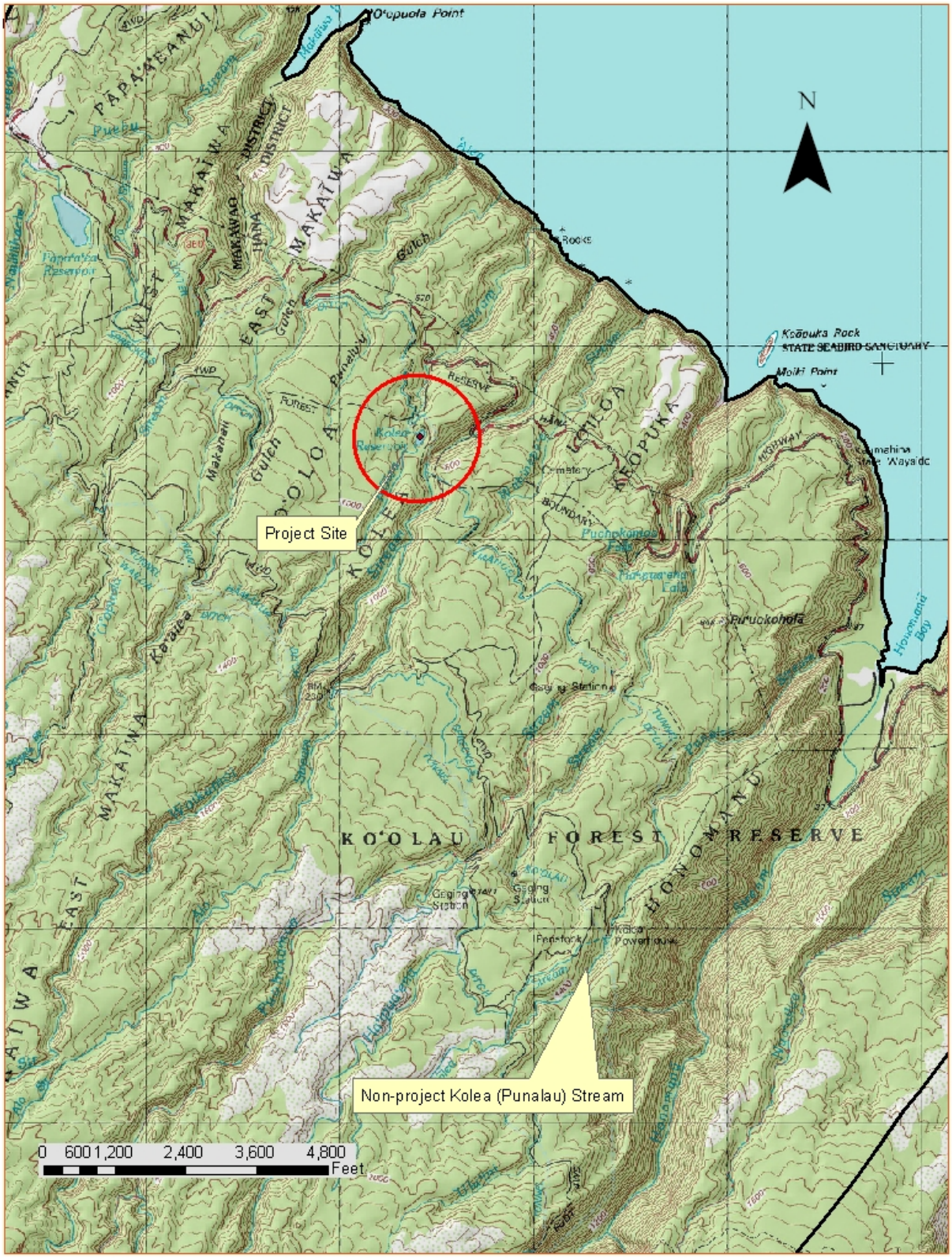
To: Derrick Elfalan, Chief, Engineering Department
From: Bob Bourke, Environmental Scientist
Date: January 5, 2011
Subject: Kolea Stream Assessment

On Thursday, December 30, 2010, John Pipan and I visited the Kolea Dam site on Maui limiting our observations below the highway to inspect the stream mouth and its ocean outfall. Pictures were taken from below Hana Highway to the mouth of Kolea Stream (see attached photos). We parked at the trail head and crossed the road to walk down the ranch road through the locked gate. The dirt road proceeds downward along the ridge top about ¼ mile past a ranch bunkhouse equipment structure. An overlook photo taken below the ranch building shows the general lush overgrown nature of the small stream valley. At about ¼ mile, before it reaches the coast, the jeep trail splits, with one branch going down either side of the ridge. We took the left fork down to the Kolea Stream. The stream bed is in a very deep (20-30 ft) gulch with almost vertical sides up to a grassy pasture area. Several photos were taken of the stream bed by leaning out and extending the camera over the chasm. Note that the extremely narrow cobble and rock stream bed with steep walls does not appear susceptible to the settlement of fine sediments.

The shoreline is an almost vertical cliff estimated to be 300 feet high (rock fall time to ocean was 4+ seconds) to the point where the stream falls over the cliff face. The cliff face is lined with Hala trees making it difficult to photograph the actual shoreline. We also accessed the trail on the other (east) side of the ridge down to a similar elevation, incised stream, and cliff face. The photos of the adjacent headland were taken from this point. Note the height of the horizon on the adjacent cliff and the character of the shoreline below. It is my opinion that accessing the stream mouth from the land side would not be practical.

The beach itself appears to consist of cliff face boulder rubble. The boulder rubble at the base of the cliff appears to be completely awash at high tide, but rapidly slopes to deep water. There is no offshore reef at this location with North Pacific swells impacting directly against the shoreline. The combination of wind and waves on the shoreline creates a highly energy charged environment. On the day the photos were taken, the weather was unusually calm, with slight Kona winds and no visible plumes from the streams, so no estimate of shoreline current direction or velocity could be made. The height of the vegetation belt up on the cliff face suggests that during normal tradewind weather the wave and splash zone is tens of feet above sea level. It does not appear reasonable to conduct a marine benthic survey or to install sedimentation meters at this outfall because the high shoreline energy and deep water immediately adjacent to shore would appear to preclude the possibility of any significant sedimentation accumulating on the benthic substrate to the extent that it could compromise the growth of corals or adversely impact other marine species.

Oceanit Center 828 Fort Street Mall, Suite 600 Honolulu, Hawaii 96813 Phone: 808.531.3017 Fax: 808.531.3177
www.oceanit.com



Map 1. Kolea Stream and vicinity. Note that there are two streams called Kolea in the area.

Photo #1. View of Kolea Stream vegetation looking north (downstream of Hana Highway).

Photo #2. View of Kolea Stream 30+ feet below looking from atop the ridge.

Photo #3. View of waterfall on Kolea Stream

Photo #4. View of cliff face.

Photo #5. View looking down rock cliff to ocean approximately 300 feet below.

Photo #6. View of boulder beach below Kolea Stream, wave action, and deep waters.

APPENDIX I:

DEA Comment Letters and Responses

CHARMAINE TAVARES
Mayor

TAMARA HORCAJO
Director

ZACHARY Z. HELM
Deputy Director

(808) 270-7230
FAX (808) 270-7934

DEPARTMENT OF PARKS & RECREATION

700 Hali'a Nakoa Street, Unit 2, Wailuku, Hawaii 96793

October 5, 2010

Derrick Elfalan, PE
Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

RE: Kolea Reservoir (HI00097) Removal Project

Dear Mr. Elfalan,

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the Kolea Reservoir Removal Project.

After review of the submitted draft environmental assessment document, we have no comment to offer concerning the reservoir removal project at this time.

Should you have any questions, please feel free to contact me, or Mr. Robert Halvorson, Capital Improvement Project Coordinator at 808.870.5942 or robert.halvorson@co.maui.hi.us

Sincerely,

TAMARA HORCAJO
Director of Parks & Recreation

c: Laura Thielen, Chairperson, Department of Land and Natural Resources
Office of Environmental Quality Control

TH:PTM:rh

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3023.1

Ms. Tamara Horcajo
Director
Department of Parks and Recreation
County of Maui
700 Halia Nakoa Street, Unit 2
Wailuku, Hawai'i 96793

Dear Ms. Horcajo:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of October 5, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, HONOLULU
FORT SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF:

October 14, 2010

Regulatory Branch

File Number POH-2010-00112

Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Attention Addressee:

This letter is in response to your request dated September 27, 2010 for Department of the Army review of the Draft Environmental Assessment (DEA) for the Kolea Reservoir Removal Project in Hana, Island of Maui, Hawaii. We have assigned the project the reference number POH-2010-00112. Please cite the reference number in any future correspondence concerning this project. We completed our review of the submitted document pursuant to Section 10 of the Rivers and Harbors Act of 1899 (Section 10) and Section 404 of the Clean Water Act (Section 404).

Section 10 requires that a Department of the Army (DA) permit be obtained from the U.S. Army Corps of Engineers (Corps) prior to undertaking any construction, dredging and other activities occurring in, over, or under navigable waters of the U.S. The line of jurisdiction extends to the Mean High Water Mark (MHWM) for tidal waters. Section 404 requires that a DA permit be obtained for the discharge (placement) of dredge and/or fill material into waters of the U.S., including wetlands. The line of jurisdiction extends to the Mean Higher High Water Mark (MHHWM) for tidally influenced waters, the Ordinary High Water Mark (OHWM) for non-tidal waters and the approved delineated boundary for wetlands.

On June 8, 2010, this office determined that the Kolea Stream is a water of the United States, subject to Corps jurisdiction and as such, a DA permit will be required for the "grading and placement of riprap" associated with the dam removal. Based on our review of the DEA, we have determined that the proposed temporary installation of the sandbag barrier will also require a DA permit prior to commencement of the proposed activity.

To avoid any unintentional violation to federal law and regulations, we advise the property owner to submit a DA permit application, available at *http://poh.usace.army.mil/EC-R/EC-R.htm*, and associated drawings relative to the proposed work. The Corps will then review the application to ensure it complies with all necessary federal laws and regulations. Note that if the fill results in the loss of waters of the U.S. and/or associated functions, the applicant may be required to provide compensatory mitigation for any unavoidable impacts.

Thank you for contacting us regarding this project and providing us with the opportunity to comment. Should you have any questions, please contact Ms. Jessie Pa'ahana at *808.438.0391* or via email at *Jessie.K.Paahana@usace.army.mil*. You are encouraged to provide comments on your experience with the Honolulu District Regulatory Branch by accessing our web-based customer survey form at *http://per2.nwp.usace.army.mil/survey.html*.

Sincerely,

George P. Young, P.E.
Chief, Regulatory Branch

Enclosure

Copy furnished (w/out enclosure):
Laura Thielen, Department of Land and Natural Resources, Kalanimoku Building, 1151 Punchbowl Street, Honolulu, , Inc., 828 Fort Street Mall, Suite 600, Honolulu, Hawaii 96813

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3024.1

Mr. George Young, PE
Chief
Regulatory Branch
U.S. Army Corps of Engineers
Department of The Army
Fort Shafter, Hawai'i
Honolulu, Hawai'i 96858-5440

Dear Mr. Young:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050
Reference Number: POH-2010-00112

This letter is in response to your comment letter of October 14, 2010 for the subject project. We appreciate your review of the Environmental Assessment (EA).

We will obtain a Section 404 permit for this project since we will be modifying waters of the United States. The permit will include grading and placement of riprap, the sandbag barrier and the placement of fill material, which includes rocks and soil.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

LINDA LINGLE
GOVERNOR

THEODORE E. LIU
DIRECTOR

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

No. 1 Capitol District Building, 250 South Hotel Street, 5th Floor, Honolulu, Hawai'i 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawai'i 96804
Web site: www.Hawai'i.gov/dbedt

Telephone: (808) 586-2355
Fax: (808) 586-2377

November 22, 2010

Mr. Derrick Elfalan, P.E.
Senior Projects Engineer
Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, Hawai'i 96813

Re: Draft Environmental Assessment for the Proposed Kolea Reservoir (HI00097) Removal Project; Hana, Maui

Dear Mr. Elfalan:

In response to your October 18, 2010 notice, thank you for the opportunity to provide comments on the Draft Environmental Assessment (DEA) for the proposed removal of the Kolea Reservoir. This project proposes to remove the Kolea Reservoir because it is no longer needed for irrigation. Chapter 343, Hawai'i Revised Statutes (HRS), environmental review is required because Kolea Reservoir is located on land owned by the State of Hawai'i, under the control of the Department of Land and Natural Resources (DLNR), and is within a Conservation District.

There are no potential impacts on electrical service utilities, and the proposed mitigation measures are discussed within the DEA. At this time, the Hawai'i State Energy Office within the Department of Business, Economic Development and Tourism (DBEDT) has no comments on the proposed project.

Our website (http://Hawaii.gov/dbedt/info/energy) provides detailed information on guidelines, directives, and statutes, as well as studies and reports on aspects of energy efficiency and renewable energy. Please do not hesitate to contact Carilyn Shon, Energy Conservation and Efficiency Branch Manager, at (808) 587-3810, for additional information on energy efficiency, and Maria Tome, Renewable Energy Branch Manager, at (808) 587-3809, for information on renewable energy resources.

Sincerely,

Theodore A. Peck
Administrator, Hawai'i State Energy Office

TAP/cbb

c: OEQC
Ms. Laura Thielen - Chairperson, Department of Land and Natural Resources
C. Shon, DBEDT-SID
M. Tome, DBEDT-SID

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3025.1

Mr. Theodore A. Peck
Administrator
Hawai'i State Energy Office
Department of Business Economic Development & Tourism
State of Hawai'i
P.O. Box 2359
Honolulu, Hawai'i 96804

Dear Mr. Peck:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of November 22, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

CHARMAINE TAVARES
Mayor

CHERYL K. OKUMA, Esq.
Director

GREGG KRESGE
Deputy Director

TRACY TAKAMINE, P.E.
Solid Waste Division

DAVID TAYLOR, P.E.
Wastewater Reclamation Division

COUNTY OF MAUI
DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
2200 MAIN STREET, SUITE 100
WAILUKU, MAUI, HAWAII 96793

October 15, 2010

Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96793

SUBJECT: **KOLEA RESERVOIR (HI00097) REMOVAL PROJECT**
DRAFT ENVIRONMENTAL ASSESSMENT
TMK (2) 1-1-001:050, HANA

We reviewed the subject application and have the following comments:

1. Solid Waste Division comments:

   a. None.

2. Wastewater Reclamation Division (WWRD) comments:

   a. None.

If you have any questions regarding this memorandum, please contact Gregg Kresge at 270-8230.

Sincerely,

CHERYL K. OKUMA
Director of Environmental Management

xc: Laura Thielen, Chairperson
Department of Land and Natural Resources

Derrick Elfalan , Senior Projects Engineer
Oceanit Laboratories, Inc.

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3026.1

Ms. Cheryl K. Okuma
Department of Environmental Management
County of Maui
2200 Main Street, Suite 100
Wailuku, Hawai'i 96793

Dear Ms. Okuma:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letters of October 15, 2010 and November 10, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal and for circulating the document for comments from the other Divisions.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

DEPARTMENT OF
HOUSING AND HUMAN CONCERNS
HOUSING DIVISION
COUNTY OF MAUI

CHARMAINE TAVARES
Mayor
LORI TSUHAKO
Director
JO-ANN T. RIDAO
Deputy Director

35 LUNALILO STREET, SUITE 102 • WAILUKU, HAWAII 96793 • PHONE (808) 270-7351 • FAX (808) 270-6284

November 19, 2010

Ms. Laura Thielen
Chairperson
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, HI 96813

Dear Ms. Thielen:

Subject: **Draft Environmental Assessment for the Kolea Reservoir (HI00097) Removal Project located in Hana, Maui. TMK: (2) 1-1-001:050**

The Housing Department has reviewed the Draft Environmental Assessment for the above subject project. Based on our review, we have determined that the subject project is not subject to Chapter 2.96, Maui County Code. The Department has no additional comments to offer at this time.

Please call Mr. Buddy Almeida of our Housing Division at 270-7356 if you have any questions.

Sincerely,

Wayde T. Oshiro

WAYDE T. OSHIRO
Housing Administrator

cc: Director of Housing and Human Concerns
Derrick Elfalan, Oceanit Laboratories, Inc. ✓

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3027.1

Mr. Wayde T. Oshiro
Housing Administrator
Department of Housing and Human Concerns
County of Maui
35 Lunalilo Street, Suite 102
Wailuku, Hawai'i 96793

Dear Mr. Oshiro:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of November 19, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

CHARMAINE TAVARES
MAYOR

DON A. MEDEIROS
Director
WAYNE A. BOTEILHO
Deputy Director
Telephone (808) 270-7511
Facsimile (808) 270-7505

DEPARTMENT OF TRANSPORTATION

COUNTY OF MAUI
200 South High Street
Wailuku, Hawaii, USA 96793-2155

September 29, 2010

Mr. Derrick Elfalan
Senoir Project Engineer
Oceanit Laboratories
828 Fort Street Mall Suite 600
Honolulu, Hawaii 96813

Subject: Kolea Reservoir Removal Project

Dear Mr. Elfalan,

Thank you for the opportunity to comment on this project. We have no comments to make at this time.

Please feel free to contact me if you have any questions.

Sincerely,

Don Medeiros
Director

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3028.1

Mr. Don Medeiros
Director
Department of Transportation
County of Maui
200 South High Street
Wailuku, Hawai'i 96793-2155

Dear Mr. Medeiros:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of September 29, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal. We were informed by the State Department of Transportation (DOT) that the selected contractor will need to obtain a permit from the DOT Highways Division, Maui District Office, if oversized and overweight equipment/loads are used on State highway facilities.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

LINDA LINGLE
GOVERNOR

MICHAEL D. FORMBY
INTERIM DIRECTOR

Deputy Directors
FRANCIS PAUL KEENO
JIRO A. SUMADA

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

STP 8.0272

November 1, 2010

Mr. Derrick Elfalan, P.E.
Senior Projects Engineer
Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

Dear Mr. Elfalan:

Subject: Kolea Reservoir Removal Project
Draft Environmental Assessment (DEA)

Thank you for requesting the State Department of Transportation's (DOT) review of the subject project.

DOT understands that the Department of Land and Natural Resources (DLNR) will be removing the Kolea Reservoir. The reservoir will be graded by breaching the dam to form a 15-foot wide earth channel with 2:1 sloping sides. On the downstream side of the reservoir, a grouted riprap apron will be constructed to allow the stream water to flow into Kolea Stream. Equipment and staging areas will be located in the vicinity of the reservoir.

Given the project's location, DOT does not anticiapte any significant, adverse impacts to its transportation facilties (Hana Highway); however, the applicant should be informed that a permit is required from DOT Highways Division, Maui District Office, to transport oversized and overweight equipment/loads within the State highway facilities.

DOT appreciates the opportunity to provide comments. If there are any other questions, including the need to meet with DOT staff, please contact Mr. David Shimokawa of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Very truly yours,

Francis Paul Keeno

for MICHAEL D. FORMBY
Interim Director of Transportation

c: Katherine Kealoha, Office of Environmental Quality Control

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3029.1

Mr. Michael D. Formby
Interim Director of Transportation
Department of Transportation
State of Hawai'i
869 Punchbowl Street
Honolulu, Hawai'i 96813-5097

Dear Mr. Formby:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of November 1, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal. The selected contractor will obtain the permit from the DOT Highways Division, Maui District Office, if oversized and overweight equipment/loads are used on State highway facilities.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

LINDA LINGLE
GOVERNOR

XXXXXXXXXXXXXXXXXXX
PATRICIA HAMAMOTO
XXXXXXXXXXXXXXX
SUPERINTENDENT

KATHRYN S. MATAYOSHI
SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF THE SUPERINTENDENT

October 21, 2010

TO: Ms. Katherine P. Kealoha, Director
Office of Environmental Quality Control
Department of Health

FROM: Kathryn S. Matayoshi, Superintendent
Department of Education

SUBJECT: Review of Draft Environmental Assessment for the
Removal of Kolea Reservoir (Hi00097)

The Department of Education has reviewed the Draft Environmental Assessment Report for the removal of Kolea Reservoir. Based on our review of the draft report, we do not have comments to offer at this time.

Should you have any questions, please do not hesitate to call Roy Ikeda of the Facilities Development Branch at 377-8310.

KSM:RI:to

c: The Honorable Laura Thielen, Chairperson, DLNR
√Derrick Elfalan, Senior Project Engineer, Oceanit

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3030.1

Ms. Kathryn S. Matayoshi
Superintendent
Department of Education
State of Hawai'i
P.O. Box 2360
Honolulu, Hawai'i 96804

Dear Ms. Matayoshi:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of October 21, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc. ✓
DLNR, Russell Tsuji

LINDA LINGLE
GOVERNOR
STATE OF HAWAI'I

KAULANA H. R. PARK
CHAIRMAN
HAWAIIAN HOMES COMMISSION

ANITA S. WONG
DEPUTY TO THE CHAIRMAN

ROBERT J. HALL
EXECUTIVE ASSISTANT

STATE OF HAWAI'I
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAI'I 96805

October 8, 2010

Laura Thielen, Chairperson
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Ms. Thielen:

Title of Project: Kolea Reservoir (H100097) Removal Project
Location: Island of Maui, Hana
Tax Map Key Numbers: (2) 1-1-001:050
Agency Action: Department of Land and Natural Resources

Thank you for the opportunity to review the subject proposal.

The Department of Hawaiian Home Lands has no comment to offer at this time. If you have any questions, please contact our Planning Office at (808) 620-9480.

Aloha and mahalo,

Kaulana H.R. Park, Chairman
Hawaiian Homes Commission

Cc: Oceanit Laboratories, Inc.
Mr. Derrick Elfalan, PE
Senior Projects Engineer

LINDA LINGLE
GOVERNOR
STATE OF HAWAI'I

KAULANA H. R. PARK
CHAIRMAN
HAWAIIAN HOMES COMMISSION

ANITA S. WONG
DEPUTY TO THE CHAIRMAN

ROBERT J. HALL
EXECUTIVE ASSISTANT

STATE OF HAWAI'I
DEPARTMENT OF HAWAIIAN HOME LANDS

P.O. BOX 1879
HONOLULU, HAWAI'I 96805

October 25, 2010

Oceanit Laboratories, Inc.
Mr. Derricek Elfalan, PE
Senior Projects Engineer
Suite 600
828 Fort Street Mall
Honolulu, Hawaii 96813

Dear Mr. Elfalan:

TITLE PROJECT: Kolea Reservoir (HI00097) Removal Project
Location: Island of Maui, Hana
Tax Map Key: (2) 1-1-001:050
Agency Action: Department of Land and Natural Resources

Thank you for the opportunity to review the subject proposal.

The Department of Hawaiian Home Lands has no comment to offer at this time. If you have any questions, please contact our Planning Office at (808) 620-9480.

Aloha and mahalo,

for Kaulana H.R. Park, Chairman
Hawaiian Homes Commission

CC: Laura Thielen, Chairperson
Department of Land and Natural Resources

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3031.1

Mr. Kaulana H.R. Park
Chairman
Hawaiian Homes Commission
Department of Hawaiian Home Lands
State of Hawai'i
P.O. Box 1879
Honolulu, Hawai'i 96805

Dear Mr. Park:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letters of October 8, 2010 and October 25, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

CHARMAINE TAVARES
Mayor

JEFFREY K. ENG
Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauiwater.org

November 22, 2010

Mr. Derrick Elfalon
Oceanit Laboratories
828 Fort Street Mall, Suite 600
Honolulu, HI 96813

Re: I.D.: Draft Environmental Assessment (DEA) (HI00097)
TMK: (2) 1-1-001:050
Project Name: Kolea Reservoir Removal

Dear Mr. Elfalon:

Thank you for the opportunity to comment on this reservoir removal project.

The project area lies outside the Department of Water Supply (DWS) service area, so our comments will be limited in scope.

The DEA states that "Deconstruction of the project will have a positive impact on water resource development because the reservoir will no longer store water for the purpose of agriculture irrigation" (Section 7.1.3, page 32). While this stream restoration project will likely have a positive impact upon water resources, there may not necessarily be a link between less agricultural irrigation in the project area, and water resource development locally, or elsewhere.

Should you have any questions, please contact our Water Resources and Planning Division at 244-8550.

Sincerely,

Jeffrey K. Eng, Director
bab

cc: engineering division

"By Water All Things Find Life"

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3032.1

Mr. Jeffrey K. Eng
Director
Department of Water Supply
County of Maui
200 South High Street
Wailuku, Hawai'i 96793

Dear Mr. Eng:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of November 22, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal. We concur that there may not be a direct link to less agricultural irrigation and water resources development. A downstream diversion on the Kōlea Stream is still in place.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

ALAN M. ARAKAWA
Mayor
WILLIAM R. SPENCE
Director
MICHELE CHOUTEAU McLEAN
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PLANNING

January 10, 2011

Mr. William Aila, Interim Chairperson
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Ms. Thielen:

SUBJECT: REQUEST FOR COMMENT (RFC) ON KOLEA RESERVOIR (HI00097) REMOVAL PROJECT DRAFT ENVIRONMENTAL ASSESSMENT (EA) LOCATED AT KOLEA, HANA, MAUI, HAWAII; TMK: (2) 1-1-001:050 (EAC 2010/0014) (RFC 2010/0064)

The Department of Planning (Department) is in receipt of your October 19, 2010, RFC on Kolea Reservoir (HI00097) Removal Project Draft EA. The project is subject to the Coastal Zone Management Act and Hawaii Revised Statutes (HRS), Chapter 205A must be observed.

Additionally, the Department requests that the State of Hawaii Department of Land and Natural Resources address any potential inconsistencies with the County of Maui Countywide Policy Plan (March 2010).

Thank you for your cooperation. The Department would like the opportunity to comment on the Final EA when available. If additional clarification is required, please contact Staff Planner Anna Benesovska at anna.benesovska@mauicounty.gov or at (808) 463-3867.

Sincerely,

CLAYTON I. YOSHIDA, AICP
Planning Program Administrator

for WILLIAM SPENCE
Planning Director

xc: Anna N. Benesovska, Staff Planner
Derrick Elfalan, PE, Senior Projects Engineer, Oceanit Laboratories, Inc.
RFC File (1 Copy)
Project File
General File

WRS:CIY:ANB:sa
K:\WP_DOCS\PLANNING\EAC\2010\0014_DAGSKoleaDamReservoir\comment.doc

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3033.1

Mr. William Spence
Planning Director
Department of Planning
County of Maui
250 South High Street
Wailuku, Hawai'i 96793

Dear Mr. Spence:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of January 10, 2011 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kolea Reservoir removal. A Coastal Zone Management Federal Consistency Review will be submitted for the project. A County of Maui Countywide Policy Plan (March 2010) section will be added to the Environmental Assessment to address any potential inconsistencies. The final copy of the Environmental Assessment will be sent to you for review.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

LINDA LINGLE
GOVERNOR OF HAWAII

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

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

In reply, please refer to:
EMD / CWB

10018PJF.10

October 11, 2010

Ms. Katherine Kealoha
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Kealoha:

SUBJECT: Draft Environmental Assessment (DEA) for Kolea Reservoir (HI00097) Removal Project Hana, Island of Maui, Hawaii TMK: (2) 1-1-001:050

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

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

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

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

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

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

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

   b. Construction dewatering effluent.

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

3. For types of wastewater not listed in Item No. 2 above or wastewater discharging into Class 1 or Class AA waters, you may need an NPDES individual permit. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at: http://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html.

4. Please contact the Army Corps of Engineers, Regulatory Branch (Tel. No.: (808)438-9258) to determine if this project requires a Section 404 Permit. Pursuant to Federal Water Pollution Control Act (commonly known as the "Clean Water Act" (CWA)), Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (Emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40, Code of Federal Regulations, Section 122.2; and HAR, Chapter 11-54.

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

If you have any questions, please visit our website at: http://www.hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

for ALEC WONG, P.E., CHIEF
Clean Water Branch

JF:ml

c: DOH-EPO #I-3357 [via email only]
Ms. Laura Thielen, Department of Land and Natural Resources
Mr. Derrick Elfalan, Oceanit Laboratories, Inc

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 4 2011

PM-3036.1

Mr. Alec Wong, P.E.
Chief
Clean Water Branch
Department of Health
State of Hawai'i
P.O. Box 3378
Honolulu, Hawai'i 96801-3378

Dear Mr. Wong:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of October 11, 2010 for the subject project. The responses below follow the same numbering system used in your letter:

1. The project will be implemented to meet the requirements of the Hawai'i Administrative Rules (HAR), Chapters 11-54 and 11-55.

2. A National Pollutant Discharge Elimination System (NPDES) permit application will be submitted to the Department of Health (DOH) for approval prior to the construction of the project.

3. The discharge point of the Kōlea Stream into the ocean is into Class AA waters. The project site is located approximately one mile mauka of the stream mouth. For the purpose of the Water Quality Certification, the discharge for this project will be soil and rocks taken from the breached dam to fill in the reservoir and to restore the stream within this vicinity to flow naturally. The disturbed area will be grassed and the stream water will not be released until the grass has been established. The diversion ditch below the reservoir will continue to divert the stream water into the irrigation system.

4. The Army Corps of Engineers has been consulted and they have determined that the Kōlea Stream is a water of the United States and a Section 404 Permit will be required for the project.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc. ✓
DLNR; Russell Tsuji, Administrator

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 · Fax: (808) 973-2941

October 27, 2010

Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

To Whom It May Concern:

Thank you for providing the Habitat Conservation Division of NOAA Fisheries Pacific Islands Regional Office (PIRO) with the opportunity to participate in the draft Environmental Assessment review process for the Kolea Reservoir Removal Project on Maui. The preferred alternative involves breaching the dam to form a 15-foot wide earth channel with 2:1 sloping sides. On the downstream side of the reservoir, a grouted riprap apron will be constructed to allow the stream water to flow into Kolea Stream in the vicinity where the existing spillway currently flows into the stream.

In order to fully evaluate the potential impacts to Coral Reef Essential Fish Habitat (EFH) (section 305(b)(4)(A)of the Magnuson-Stevens Fishery Conservation and Management Act), PIRO suggests additional information be included in the Final Environmental Assessment. These recommendations are overlapping and/or build off our pre-consultation comments provided in an earlier e-mail to Joanna Hiramitsu dated 5/17/2010:

1) Include a description of whether and how the least environmentally damaging alternative has been chosen, e.g. whether the alternative using minimal hard structures, retaining to the greatest extent the natural characteristics of the stream, has been considered. As it stands now, only one alternative has been proposed beyond the no action alternative.
2) Provide a preferably quantitative prediction of potential impacts to stream turbidity, i.e. if/how the preferred alternative (both during and post construction) might lead to increased sediment/pollution loading in the stream and hence discharge in to the ocean.
3) Provide a better description of the marine benthic resources (EFH) that are found at the mouth of the stream. An inference that the prevailing oceanic conditions limit coral growth and a statement that no coral are known to be present at the mouth is not appropriate without either conducting a survey of the area to support this, or alternatively summarizing and referring to another study addressing this.

4) Clarify how effective the avoidance and minimization measures that will be implemented to reduce and limit sediment/pollution input to the stream and thus ocean are expected to be.

Again, we appreciate the opportunity to comment on this project, please contact Danielle Jayewardene at 808-944-2162 if you have any questions.

Sincerely,

Alan Everson
Acting Assistant Regional Administrator
PIRO Habitat Conservation Division

Copies furnished:

- Laura Thielen, Chairperson, Department of Land and Natural Resources, Kalanimoku Bldg, 1151 Punchbowl St, Honolulu, HI 96813
- Derrick Elfalan, PE Senior Project Engineer, Oceanit Laboratories Inc, 828 Fort Street Mall, Suite 600, Honolulu, HI 96813
- U.S Environmental Protection Agency, Region 9, P.O. Box 50003, Honolulu, HI 96850
- U.S. Fish and Wildlife Service, Environmental Services, P.O. Box 50088, Honolulu, HI 96850
- State of Hawaii, Department of Land and Natural Resources, Division of Aquatic Resources, P.O. Box 621, Honolulu, HI 96809

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 4 2011

PM-3035.1

Mr. Alan Everson
Acting Assistant Regional Administrator
PIRO Habitat Conservation Division
Pacific Islands Regional Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
1601 Kapiolani Boulevard, Suite 1110
Honolulu, Hawai'i 96814-4700

Dear Mr. Everson:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of October 27, 2010 and subsequent emails (Attachment 1) for the subject project. We appreciate your review of the Environmental Assessment (EA).

The only other alternative that was considered for this reservoir was to repair the dam. However, the alternative was not considered the best alternative for two reasons: 1) the cost to repair the dam was too high; and 2) the dam was no longer needed to store water in the reservoir for irrigation purposes. We will add this alternative to the Environmental Assessment (EA).

The Best Management Practices that are planned for the project will control sediment runoff during and after construction. The stream water will not be released into the area designed to restore the natural course of the stream through the reservoir area until the vegetation has been established. In addition, the check dams will trap sediment before flowing downstream and water quality monitoring will also be conducted for one week after the stream reestablishes the new alignment.

With regards to the marine benthic resources and essential fish habitat (EFH), a site visit to the mouth of the Kōlea Stream was conducted and a report was submitted (see Attachment 2). Also note that the length of the stream that will be restored is only 570 feet long and is approximately a mile inland from the stream mouth.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc. ✓
DLNR; Russell Tsuji, Administrator

Joanne Hiramatsu

Subject: FW: Comments on Kolea EA
Attachments: Fabricius 2005 Review runoff effect on coral.pdf; Rogers 1990 Review sedimentation to coral.pdf; Storlazzi et al 2011 use of sediment traps on reefs.pdf

From: Danielle Jayewardene [mailto:Danielle.Jayewardene@noaa.gov]
Sent: Tuesday, January 18, 2011 11:10 AM
To: Joanne Hiramatsu
Cc: Robert Bourke; Derrick Elfalan; alan.everson; Gerry.Davis@noaa.gov; mark.a.yamabe@hawaii.gov; Lydia.M.Morikawa@hawaii.gov
Subject: Re: Comments on Kolea EA

Hi Joanne,

Thanks for the contacts at DAGS and DLNR: I have cc'd them on this message as we like to keep the line of communication open with the applicants of projects.

Good question, but unfortunately we do not have written guidelines or standards that I can point you to for sedimentation rates, grain size and/or type of sediment that would have an adverse effect on Coral reef EFH (definition = all substrate down to 100m depth and water column down to 200m depth from shoreline out to EEZ boundary). The sedimentation effect to coral (important component of Coral Reef EFH) varies dependent on the species of coral being affected, the sediment type, the prevailing environmental conditions etc. The attached papers and link
(http://walrus.wr.usgs.gov/coralreefs/pubs.html#papers) may be
informative: the Fabricius 2005 paper section on sedimentation perhaps addresses your questions most specifically.

I haven't received the benthic data yet, but I will forward it to you as soon as I receive it. You are of course welcome to contact our Science Center directly if you wish (http://www.pifsc.noaa.gov/cred/index.php).
They continuously collect ecological and oceanographic data from the Pacific which is available to the public, a useful resource in general.

Aloha
Danielle

Joanne Hiramatsu wrote:
> Hi Danielle:
>
> Thanks. Looking forward to receiving the studies you discovered. Are there standards or guidelines for what concentrations, size, and type of silt (organic/inorganic) that would have an adverse impact to EFH species? If so, can you provide to us or direct me to the site that I can download?
>
> The contact persons at DAGS and DLNR follows:
>
> Mark A. Yamabe
> Project Management Branch
> Dept. of Accounting and General Services (DAGS)
> 1151 Punchbowl Street, Room 427
> Honolulu, HI 96813
> mark.a.yamabe@hawaii.gov
> Phone: (808) 586-0469

> Fax: (808) 586-0530
>
> Lydia Morikawa
> Land Manager
> DLNR - Land Branch
> 1151 Punchbowl Street
> Honolulu, HI 96813
> Phone: (808) 587-0410
> Fax: (808) 587-0422
> Email: Lydia.M.Morikawa@hawaii.gov
>
> Thanks,
> Joanne
>
> Joanne Hiramatsu | Oceanit | Manager, Environmental Engineering & Planning
> Senior Planner, Project Manager
> 828 Fort. St. Mall. Suite 600. Honolulu, HI 96813
> P: 808.531.3017 x262| F: 808.531.3177| Direct: 808.954.4262| Cell: 808.222.2602
> E: jhiramatsu@oceanit.com
> Click4 | Map | Video | Website | Careers
>
> NEWS: Watch "Weird Science with Dr. V" every Tues at 6:40am on KGMB9
>
> P Please consider the environment before printing this message
>
> NOTICE TO RECIPIENT: This message may contain confidential or privileged information and any unauthorized use, disclosure or copying of this message or its contents is prohibited. If you are not the intended recipient, please reply to advise the sender of the error and immediately delete this message and any attachments from your system.
>
> -----Original Message-----
> From: Danielle Jayewardene [mailto:Danielle.Jayewardene@noaa.gov]
> Sent: Thursday, January 13, 2011 4:15 PM
> To: Joanne Hiramatsu
> Cc: Robert Bourke; Derrick Elfalan; alan.everson; Gerry.Davis@noaa.gov
> Subject: Re: Comments on Kolea EA
>
> Hi Joanne,
>
> Indeed the concern is sediment settling on sensitive benthos and/or
> increasing turbidity, i.e. reducing water quality, both impacts
> potentially adverse effects to Coral Reef Essential Fish Habitat (EFH).
>
> Most likely, there isn't an abundance of sensitive benthos at the
> mouth, and as you say probably sufficient water movement to move any
> sediment offshore pretty quick. Still, NMFS needs to ensure that best
> available science supports these statements, i.e. has been used to
> evaluate potential impacts to EFH. I am working on getting benthic
> data from NOAA's Science Center for the area, they did some benthic
> surveys in
> 2008 and 2010. I hope to have this in hand in the next couple of days.
> Can you get some data to verify your statement/observations regarding
> the oceanic conditions along that coast?
>
> Also, could you please forward us the contact information for project
> managers at DAGS and DLNR?
>

> Thanks,
> Danielle
>
> Joanne Hiramatsu wrote:
>
>> Happy New Year Danielle:
>>
>> Thanks for your response. I tried searching for benthic surveys in this region, but only found studies done on the southern coast of Maui and found none on the northern coast in the vicinity of the Kolea Stream mouth. If you do find something, would appreciate if you can share the studies with me.
>>
>> I believe the concern at the mouth of Kolea Stream was sediment settling on coral. With the wave action along the coast, even on a calm day as shown in the memo photos, we feel that the wave action will quickly move sediment offshore and mix rapidly, rather than settling on any coral that may be present.
>>
>> DAGS is the administrator of the contract, but DLNR is the owner and will be the approving agency.
>>
>> Joanne Hiramatsu | Oceanit | Manager, Environmental Engineering & Planning
>> Senior Planner, Project Manager
>> 828 Fort. St. Mall. Suite 600. Honolulu, HI 96813
>> P: 808.531.3017 x262| F: 808.531.3177| Direct: 808.954.4262| Cell: 808.222.2602
>> E: jhiramatsu@oceanit.com
>>
>> -----Original Message-----
>> From: Danielle Jayewardene [mailto:Danielle.Jayewardene@noaa.gov]
>> Sent: Friday, January 07, 2011 11:30 AM
>> To: Joanne Hiramatsu
>> Cc: Robert Bourke; Derrick Elfalan; alan.everson
>> Subject: Re: Comments on Kolea EA
>>
>> Hi Joanne,
>>
>> Happy New year!
>>
>> Yes I've understood this is a tricky coastline due to the cliffs and
>> high wave exposure. I've read the attached report, and indeed it is
>> clear it requires a large effort to survey the marine resources at
>> the stream mouth. As it's always best to avoid making assumption to
>> the greatest extent possible, I wonder whether you could find out
>> whether any other entities have in-situ information on benthic
>> resources from the area that you can refer to? I contacted a couple
>> of people at DAR on Maui yesterday to see if they have any insight
>> from work they've done. I also shot off an e-mail to NMFS Pacific
>> Island's Fisheries Science Center (PIFSC) Coral Reef Ecosystem
>> Division (CRED) who may have some relevant information from having done surveys along that coast by ship.
>> I will get back to you asap with any insight.
>>
>> In regards to this project, who exactly is the applicant, i.e. your
>> client? Office of Environmental quality Control? I would like to
>> include the contact person on this correspondence so they are in the loop.
>>
>> Thanks!
>> Danielle

>>
Danielle Jayewardene Ph.D.
Coral Reef Ecologist
NOAA Fisheries, Pacific Islands Regional Office
1601 Kapiolani Blvd, Suite 1110
Honolulu, HI 96814
Phone # (808) 944 2162
Fax # (808) 973 2941

>> Joanne Hiramatsu wrote:
>>
>>> Danielle:
>>>
>>> This is in regards to the comment letter (Item 3) provided for the
>>> Kolea EA for removal of a reservoir. We did a site visit to look at
>>> the stream mouth and the attached memo provides the results. Your
>>> comment No. 3 suggests that a benthic survey may be needed. However,
>>> after assessing the stream mouth conditions, we feel that conditions
>>> at the mouth of the stream precludes any coral growth in this
>>> vicinity due to the shoreline conditions. The mouth is not
>>> accessible by land and access by sea would present some safety
>>> concerns. Can you please review the attached and let us know if this
>>> information will satisfy comment No. 3? If not, we would like to
>>> meet to see how best we can address this comment.
>>>
>>> Thanks,
>>> Joanne

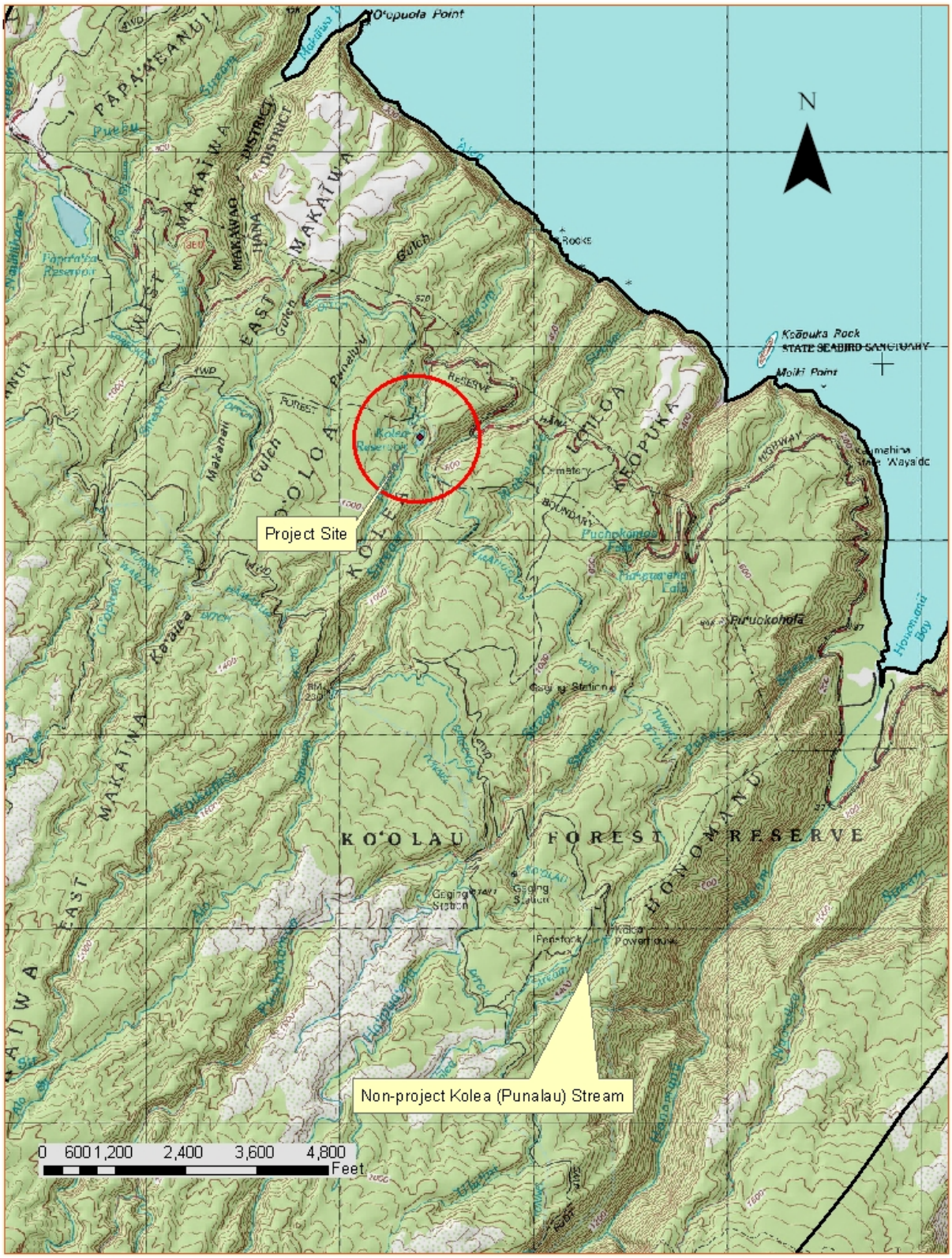
oceanit
innovation through engineering & scientific excellence

To: Derrick Elfalan, Chief, Engineering Department
From: Bob Bourke, Environmental Scientist
Date: January 5, 2010
Subject: Kolea Stream Assessment

On Thursday, December 30, 2010, John Pipan and I visited the Kolea Dam site on Maui limiting our observations below the highway to inspect the stream mouth and its ocean outfall. Pictures were taken from below Hana Highway to the mouth of Kolea Stream (see attached photos). We parked at the trail head and crossed the road to walk down the ranch road through the locked gate. The dirt road proceeds downward along the ridge top about ¼ mile past a ranch bunkhouse equipment structure. An overlook photo taken below the ranch building shows the general lush overgrown nature of the small stream valley. At about ¼ mile, before it reaches the coast, the jeep trail splits, with one branch going down either side of the ridge. We took the left fork down to the Kolea Stream. The stream bed is in a very deep (20-30 ft) gulch with almost vertical sides up to a grassy pasture area. Several photos were taken of the stream bed by leaning out and extending the camera over the chasm. Note that the extremely narrow cobble and rock stream bed with steep walls does not appear susceptible to the settlement of fine sediments.

The shoreline is an almost vertical cliff estimated to be 300 feet high (rock fall time to ocean was 4+ seconds) to the point where the stream falls over the cliff face. The cliff face is lined with Hala trees making it difficult to photograph the actual shoreline. We also accessed the trail on the other (east) side of the ridge down to a similar elevation, incised stream, and cliff face. The photos of the adjacent headland were taken from this point. Note the height of the horizon on the adjacent cliff and the character of the shoreline below. It is my opinion that accessing the stream mouth from the land side would not be practical.

The beach itself appears to consist of cliff face boulder rubble. The boulder rubble at the base of the cliff appears to be completely awash at high tide, but rapidly slopes to deep water. There is no offshore reef at this location with North Pacific swells impacting directly against the shoreline. The combination of wind and waves on the shoreline creates a highly energy charged environment. On the day the photos were taken, the weather was unusually calm, with slight Kona winds and no visible plumes from the streams, so no estimate of shoreline current direction or velocity could be made. The height of the vegetation belt up on the cliff face suggests that during normal tradewind weather the wave and splash zone is tens of feet above sea level. It does not appear reasonable to conduct a marine benthic survey or to install sedimentation meters at this outfall because the high shoreline energy and deep water immediately adjacent to shore would appear to preclude the possibility of any significant sedimentation accumulating on the benthic substrate to the extent that it could compromise the growth of corals or adversely impact other marine species.



Map 1. Kolea Stream and vicinity. Note that there are two streams called Kolea in the area.

Photo #1. View of Kolea Stream vegetation looking north (downstream of Hana Highway).

Photo #2. View of Kolea Stream 30+ feet below looking from atop the ridge.

Photo #3. View of waterfall on Kolea Stream

Photo #4. View of cliff face.

Photo #5. View looking down rock cliff to ocean approximately 300 feet below.

Photo #6. View of boulder beach below Kolea Stream, wave action, and deep waters.

MAUI TOMORROW

Protecting Maui's Future

Nov 22, 2010

Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, HI 96813

RE: Comments on DEA Kolea Reservoir Removal, Hana, Maui

Thank you for the opportunity to offer comments on the proposed project.
Maui Tomorrow Foundation has been active in efforts to restore stream flows in East Maui for over a decade.

We have reviewed this proposal with the hope that the project could contribute to stream health in the region, but find that essential information that would confirm that conclusion is missing from the Draft Environmental Assessment. We request that more detailed and specific information be included in the project's Final EA as required by chapter 343.

Specific information that is missing, or inadequately discussed:

Need To Remove Dam Structure:
The discussion of the dam's structural analyses does not appear to conclude that it has confirmed structural weaknesses, only that a future breach would cause impacts to Hana Highway. Is there a specific reason that the dam is known to be unsound? If so, this should be included in the FEA.

If the dam is merely being removed as a precaution, or because funding is available, that should be clearly discussed in the FEA..

Compliance with Water Resource Development Functional Plan
Objectives of the WRD Plan included in the DEA are:

Coordinate development of land use activities with existing and potential water supply;
Support research and development of alternative methods to meet future water requirements;

Reclaim and encourage the productive use of runoff water and wastewater discharges;
Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use;

Support water supply services to areas experiencing critical water problems.
Promote water conservation programs;

The DEA concludes:
Deconstruction of the project will have positive impact on water resource development because the reservoir will no longer store water for the purpose of agriculture irrigation. The reservoir that allows water to be stored will be breached so that water will flow more naturally into the stream.

This statement does not address any of the WRDFP goals stated above. In fact, the reservoir , located down slope from steeper terrain, is likely providing a way to capture stormwater runoff. The last objective of supporting water supply services to areas with critical problems is may also be contradicted by the proposed dam removal, if areas such as Huelo and Honopou that have no public water supply and have recently been granted increased stream flows in the vicinity of the Lowrie Ditch, see those stream flows impacted by loss of storage capacity in Kolea 7 miles to the east.

Relationship of Kolea Dam as part of EMI storage system.
The DEA does not discuss the rationale for lessening EMI's storage capacity by the removal of the Kolea dam and reservoir. EMI and HC&S have given repeated public testimony that during months of low rainfall they are hard pressed to have enough water for crop irrigation and County water supply demands.

The historic review section of the DEA reveals that the reservoir and dam were constructed in 1901 to harness the flows of Kolea stream to augment water supplies to HC&S's Lowrie ditch during times of low stream flows.

Low stream flow conditions still exist many months of the year in East Maui and overall average rainfall levels have dropped by up to 50% in the region, according to USGS studies.

• The EMI system demands MORE water from the east Maui streams now than it did in the early part of the 20th century. (Based on contract records with the state)

• How will the Lowrie ditch continue to receive sufficient flows for HC&S needs? This should be clearly explained and discussed in the FEA, with factual data.

Compliance with State Agricultural Functional Plan
The DEA states:
"Deconstruction of the project will have an adverse impact on agriculture because the reservoir will no longer store water for the purpose of agriculture irrigation. However, the reason the reservoir is being removed is because it is no longer needed for agricultural irrigation and for dam breach safety measures."

• The DEA concludes that "Agriculture irrigation is no longer needed from this reservoir," but does not explain why that is so. Does the reservoir leak? Is it costly to maintain? Are the ditch systems it serves (Center and Lowrie Ditch) being modified?

• Specific information about the reasons for abandoning the potential ag water storage capacity of the Kolea reservoir should be included in the FEA, otherwise it is not accurate to conclude that the proposed project complies with the State Agricultural Functional Plan.

Secondary Impacts of Reservoir Capacity Loss

• The DEA does not discuss what impacts removal of a potential 5 million gal of storage capacity from the EMI system would have on the withdrawals from other streams to the west. Will stream flows be impacted during low flows if the reservoir capacity is diminished?

• Several streams feeding the Lowrie ditch to the west (Hanehoi, Puolua and Honopou) have been given small amounts of restored flows during both low and high seasonal flows. If the Lowrie Ditch loses reservoir back up in drier times, will restored flows at these streams be impacted to make up the difference? These are secondary impacts that at the very least must be discussed in the EA.

• The DEA does not discuss if EMI has plans to make up for the lost capacity of Kolea reservoir by perhaps deepening or expanding other reservoirs. Those actions would constitute secondary impacts of this action, even if they are taking place on private lands, and should be discussed, as required our state environmental laws.

Kolea Stream Restoration

The project description is given as removal of Kolea dam and "restoration of the stream," but it is not clearly discussed how much of the stream would be "restored."

• No data is provided on what restored flow levels are expected to be and how this compares to present and historic flow levels.

• Although a brief, one-day six sample aquatic survey was conducted, it appeared to include six on-stream sites and no transects, due to high water levels. No visits were made under drier conditions, as is standard for aquatic biology. The methodology used was not consistent with that used by USGS in other east Maui stream studies, therefore conclusions could be of limited use to advance our knowledge of the area's flora and fauna.

• No discussion was included regarding potential for strategies to help increased flows improve aquatic habitat instream for invertebrates and native stream species. This information should be included in the FEA if the project is being labeled a "stream restoration."

• The Biological Survey Report theorizes that the existing ditch blocks migration of non-native species on Kolea stream from the Hana highway bridge to Kolea dam. The Report does not refer to the role of increased stream flow in clearing away non-native species from streams and does not acknowledge that non-native aquatic life can be reintroduced via ditch flows from stream to stream.

• Without clearly identifying these impacts, proper mitigations to have the proposed restoration create actual benefit to the stream, could be limited. The FEA should provide an accurate analysis of the post dam removal conditions in the stream.

• If the dam and reservoir are removed, it appears that the Kolea stream will still be intercepted by the Center ditch intake, a few hundred feet below the present Kolea dam. How much of the stream's flow is expected to be captured by this intake at high, low and median flow levels?

• No data is provided in the DEA on the water demand of the Kolea Dam reservoir system on Kolea stream historically, at present and after the proposed project. This is critical information to determine appropriate mitigations for the project's impacts.

• A series of check dams are proposed in the stream channel to combat sediment loads. Will these have any impacts on stream flows or stream life habitat? Native stream life prefers faster moving waters. Will stream velocities change after the proposed restoration? These topics should be discussed in the FEA.

• The DEA states that a "low head dam on Manual Luis ditch stream would "limit non-native fish" but not pose a threat to native fish migrations." The FEA should further explain how native fish can bypass or scale this dam and what native and non- native population counts are above and below it.

Historic Preservation:
The historic review of the dam acknowledges that the Kolea Dam and reservoir is an excellent example of its type of historic structure and is eligible for listing on the State Register.

The historic research and photo documentation done for the site is excellent, however for meaningful mitigation this material should be more widely presented to better compensate for the loss of a well-constructed and accessible remnant of an important era of Maui's history.

The history included in the project's AIS and Architectural Review should be available not just as an Appendix of the EA, but in a more widely viewable format with photo images of the dam and reservoir. At a minimum this could be posted as a specific document downloadable from the state DLNR website, and more preferably, both the download and a simple commemorative display could be created and installed at the popular Waiakamoi State Park., possibly in partnership with local historic preservation groups.

Cultural Impact Assessment
There is no discussion of whether local residents use the Kolea reservoir or stream for gathering, although extensive declarations of use of various stream resources in the region are on file with the state Water Commission as part of the Native Hawaiian legal Corp. IISF petition. The area is popular for bamboo shoot harvesting and other gathering may also take place there.

Botanical/Avian Survey
The Biological survey confuses the locations of the Manuel Luis and the Center ditches in relationship to the Kolea dam. The Manuel Luis ditch does not intercept Kolea stream. It intercepts Alo/ Waiakamoi stream in an area of higher elevation than the Kolea dam. Center Ditch is a separate structure, unconnected to Manuel Luis ditch that begins at Waiakamoi stream and terminates at Naili'iliha'ele stream in Kailua, to the west. It is located downstream of the Dam.

The Biological Survey appears limited, both in scope and in timeframe. Of especial concern is that various studies point to rare and endangered native damselflies known to be in the Waiakamoi/ Puohakamoa/ Haipuaena area,

The assessment acknowledges that the endangered native damsel fly species (M. Pacificum) has been noted in the region, but then dismisses any chance of it finding habitat in Kolea stream.

This assumption seems shortsighted since it is known that East Maui streams, below 2000" elevation, from Nahiku to Waikamoi are the last remaining habitats where these creatures have been seen. New information about their presence is added every year. The two species were proposed for listing when the Biological Survey was prepared (April 2010), but are now officially listed.

Gina Shultz, acting field supervisor of the Fish and Wildlife Service's Pacific Islands Fish and Wildlife Office was quoted in announcing the federal listing of both M. Pacificum and M Nesiotes damselflies as endangered species in June 2010: This fact should be noted in the FEA.

"We hope the added protection these colorful insects receive from endangered species status will help bring them back from the brink of extinction, but we realize the fate of Hawaiian damselflies depends on protecting, restoring and maintaining the natural health of Hawaii's streams and water systems." The Pacific Hawaiian damselfly was historically found on all of the main Hawaiian Islands except Kaho'olawe and Ni'ihau. This species is found at lower elevations, below 2,000 feet, and breeds predominantly in standing water such as marshes, ponds and pools along stream channels."

Would the Center ditch intake area below the proposed dam removal project serve as potential breeding pool habitat if it was modified? Topics like this should be included in the FEA. The FEA should also discuss what mitigations could be made to improve stream habitat to make it suitable for increased native stream and insect life. Currently the EA claims "gains in native stream habitat will not be substantial from removal of this dam." If this is a stream restoration project supported by public funds, it should provide verified benefits to public trust resources such as native flora and fauna.

Mitigations could include follow up studies on native stream life, monitoring and native species reintroduction.

Thank you for the opportunity to submit these comments. We look forward to seeing Final EA that addresses these topics.

Sincerely,

Irene Bowie

Irene Bowie
Executive Director

Cc: Oceanit, Suite 600, 828 Fort Street Mall, Honolulu, HI 96813

55 N. Church St. Ste. A5, Wailuku, HI 96793 808.244.7570 director@maui-tomorrow.org

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 4 2011

PM-3037.1

Ms. Irene Bowie
Executive Director
Maui Tomorrow
55 North Church Street, A5
Wailuku, Hawai'i 96793

Dear Ms. Bowie:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of November 22, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment (DEA) for the Kōlea Reservoir removal. The responses match the order of the bold points in your letter.

The primary purpose of the project is to remove a potentially hazardous dam. In the course of removing the dam, the stream channel in the vicinity of the dam will be restored to a more natural condition. No additional stream flow will result from removing the dam. The project will not impact regional stream health.

Need to Remove Dam Structures

The dam does not have any known structural defects. Despite this, extensive rehabilitation work would be necessary to bring the dam in compliance with the State Dam Safety Standards. The Phase I Visual Dam Inspection Report by GEI Consultants concluded that the Kōlea Reservoir is in "conditionally fair" condition. To rehabilitate this structure and have it be a viable component of East Maui Irrigation Company's (EMI) water system is extremely cost prohibitive. GEI Consultants made the following recommendations for maintaining the dam and assessing the dam's condition. Additional construction work would be required to implement the recommendations of these studies.

PRIORITY 1 RECOMMENDATIONS

1. Implement a vegetation control plan coordinated with inspections
2. Conduct a survey of the entire embankment and spillway
3. Remove slumped soil and investigate condition of buried pipe
4. Investigate condition of the outlet pipes - Repair if necessary
5. Implement a plan and schedule for monitoring seepage flows

PRIORITY 2 RECOMMENDATIONS

1. Confirm the upstream watershed drainage area
2. Conduct a Phase II Hydrology & Hydraulics Study
3. Perform a Phase II Stability Analysis
4. Update the Emergency Action Plan
5. Repair or Replace the Staff Gage

Compliance with Water Resource Development Functional Plan & the DEA concludes

The Water Resource Development Functional Plan (WRDFP) encourages the use of alternative water supplies and the reuse of storm water. Kōlea Reservoir has a capacity of about 8 million gallons and is distant from any potential users. Its small size and relative isolation make it unsuitable for storage of storm water or other alternative water sources.

Relationship of Kōlea Dam as part of the EMI storage system

Removal of the reservoir will have very little impact on the flows in the EMI system. The reservoir capacity is about 8 million gallons. The dam outlet works can be used to empty the reservoir in about one day. The dam provides a small amount of stream flow regulation upstream from EMI's stream diversion, but does not provide significant water storage for the summer dry season.

The downstream stream diversion works are not part of the project and will continue to be used to divert the Kōlea Stream water into the EMI transmission system (Lowrie Ditch). Therefore, flows in the Lowrie Ditch will not be significantly affected by the removal of the Kōlea Reservoir.

Compliance with State Agricultural Functional Plan

The reservoir is not currently used for agricultural water storage. It impounds water from the Kōlea Stream, but the water is released downstream through the outlet works or via the spillway. Water is not released directly from the reservoir into the irrigation system. We

acknowledge that Kōlea was constructed as a part of the EMI system, but it is no longer a necessary component of the system.

The reasons for removing the dam are discussed above. The ditch system served by the diversion below the reservoir will not be altered as part of this project.

The reservoir provides approximately 8 million gallons of storage and functions only to regulate the flow of the Kōlea Stream. The loss of this flow regulation function will not significantly impact the downstream agricultural uses of the stream water.

Secondary Impacts of Reservoir Capacity Loss

Neighboring streams will not be affected by the removal of the Kōlea Reservoir. The removal of the reservoir does not reduce EMI's capacity. They will continue to divert water from the Kōlea Stream.

Existing flows within neighboring streams will not be affected by the removal of the reservoir. The reservoir removal will not affect the diversion on the Kōlea Stream below the Kōlea Reservoir and EMI will continue to divert water from the Kōlea Stream. The dam removal in no way authorizes EMI to increase diversion rates at other streams.

The removal of the reservoir will not affect the operation or maintenance of the other reservoirs in their irrigation system. EMI will not need to expand the other reservoirs.

Kōlea Stream Restoration

The responses in this section are numbered according to the bullet points in your letter.

1. There are no records on historic flows in the Kōlea Stream. Flow levels are not expected to be significantly affected by the removal of the dam.

2. The biological report was not intended to be consistent with the U.S. Geological Survey (USGS) research on the East Maui streams. The primary purpose of the surveys was to determine if any biological resources of interest or concern, and particularly if any species currently listed as threatened, endangered, or proposed for listing under either the Federal or State endangered species programs, occur on or within the immediate vicinity of the Kōlea Dam, and assess whether biological resources might be impacted by removal of the dam.

3. The intent of the project is to remove the dam. After the dam embankment is partially removed, the stream channel under the existing embankment will be restored

to a condition resembling its original state. As mentioned earlier, the removal of the dam will not affect the net stream discharge.

Only the parts of the stream channel submerged by the reservoir or covered by the dam embankment would be restored. In this case, "stream restoration" means the restoration of the channel where the reservoir exists and elimination of the artificial impoundment. There will be no measurable impact on low flow stream discharge. Impacts to the stream flow from the reservoir removal will include: 1) slight increase in flow due to the decreased evapotranspiration; and 2) increase in peak storm flows due to the slight loss of storm flow attenuation provided by the dam. This is primarily a reservoir-dam removal project and only the stream channel currently inundated by the reservoir or covered by the dam embankment will be restored to a more natural condition.

4. We acknowledge that the stream increased stream flows may improve the aquatic habitat, but note that the dam removal will not affect the stream flow. We also acknowledge that the aquatic flora and fauna might be introduced via the irrigation ditch. This is stated on page 18 of the Biological Report. The irrigation ditch is entirely separate from this project and the dam removal will not affect the operation of the stream diversion.

5. It is expected that the restoration of the stream will be limited. Currently, about 200 feet of the stream channel is covered by the dam embankment and 400 feet of the stream channel is periodically inundated by the impounded reservoir. After the dam is removed, the stream will flow unimpeded through the area. The check dams will not impound significant volumes of water. The area will be grassed after grading is completed. It is expected that the bamboo from the adjacent areas will quickly reestablish in the graded areas and reservoir bottom.

6. The Center Ditch diversion is not part of this project and EMI will continue to operate the diversion. The operation of the EMI intake is not relevant to the dam removal project.

7. We agree that water demand data from the Kōlea Reservoir would be useful, but there are no data sources available on the historic water demand of the Kōlea Reservoir.

8. Stream velocities will increase after the restoration. The water velocities in the reservoir are near zero and when the dam is removed, the stream will flow through the site. The check dams are necessary to retain sediment as site vegetation establishes. The check dams are not expected to be permanent. They will be damaged by flood flows in the stream.

9. The low head dam (diversion structure) is not part of the dam removal project, therefore, it will not be altered. Discussion of the structure and its effects is not relevant.

Historic Preservation

We understand your concern about records retention and disseminating the historic information collected during this project. Currently these records are only retained at the State Historic Preservation Office.

Cultural Impact Assessment

The authors of the Cultural Impact Assessment did not find any evidence that residents were using the stream for any gathering other than for bamboo shoots.

Botanical/Avian Survey

Thank you for correcting our error. We agree that the diversion below the reservoir is into the Center Ditch, and not the Manual Luis.

The Biological Survey Report was adequate for the dam removal project. No known damsel fly habitat was discovered in the project area. The stream bed under the reservoir and dam embankment will be restored to a more natural state to allow more habitats for the damsel fly in the long run.

We understand your concerns about the Center Ditch stream diversion. As stated earlier, the stream diversion below Kōlea Reservoir is not part of this project. The diversion is an entirely different structure and it is not appropriate to discuss the stream diversion in the EA.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc. ✓
DLNR; Russell Tsuji, Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 8, 2010

Oceanit Laboratories, Inc.
828 Fort Street Mall Suite 600
Honolulu, Hawaii 96813

Attention: Mr. Derrick Elfalan, PE
Senior Projects Engineer

Ladies and Gentlemen:

Subject: Draft Environmental Assessment for the Kolea Reservoir (Hi00097) Removal Project

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comment.

Other than the comments from Division of Forestry & Wildlife, Commission on Water Resource Management, Office of Conservation & Coastal Lands, Engineering Division, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Historic Preservation will be submitting comments through a separate letter. Should you have any questions, please feel free to call our office at 587-0414. Thank you.

Sincerely,

Russell Y. Tsuji
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

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

RECEIVED
LAND DIVISION

2010 OCT 28 A 8:31

DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

October 25, 2010

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
__ Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division –Maui District

FROM: Charlene Unoki, Assistant Administrator Charlene
SUBJECT: Draft Environmental Assessment for the Kolea Reservoir (Hi00097) Removal Project
LOCATION: Island of Maui
APPLICANT: Oceanit on behalf of DLNR

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by November 5, 2010.

Only 1 copy of the report available in Room 220.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed:
Date: 10/27/10

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/CharleneUnoki
RE:DEAKoleaReservoirRemoval
Maui.525

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

(X) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone X. The Flood Insurance Program does not have any regulations for developments within Flood Zone X.

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

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

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

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

( ) Mr. Carter Romero at (808) 961-8943 of the County of Hawaii, Department of Public Works.

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

( ) Ms. Wynne Ushigome at (808) 241-4890 of the County of Kauai, Department of Public Works.

( ) The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

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

( ) Additional Comments: _____

_____

( ) Other: _____

_____

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

Signed:_____
CARTY S. CHANG, CHIEF ENGINEER

Date:_____

LINDA LINGLE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
2010 NOV -4 A 11:54
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

October 25, 2010

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division –Maui District

FROM: Charlene Unoki, Assistant Administrator Charlene
SUBJECT: Draft Environmental Assessment for the Kolea Reservoir (Hi00097) Removal Project
LOCATION: Island of Maui
APPLICANT: Oceanit on behalf of DLNR

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by November 5, 2010.

Only 1 copy of the report available in Room 220.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
(✓) We have no comments.
( ) Comments are attached.

Signed: _____
Date: 11/3/10

LINDA LINGLE
GOVERNOR OF HAWAII

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

RECEIVED
LAND DIVISION
2010 NOV -4 P 12:41
DEPT OF LAND & NATURAL RESOURCES STATE OF HAWAII

2010 OCT 26 AM 9:43
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

October 25, 2010

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
__ Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division –Maui District

FROM: Charlene Unoki, Assistant Administrator Charlene

SUBJECT: Draft Environmental Assessment for the Kolea Reservoir (Hi00097) Removal Project

LOCATION: Island of Maui

APPLICANT: Oceanit on behalf of DLNR

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by November 5, 2010.

Only 1 copy of the report available in Room 220.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed: Dean Uyeno
Date: 11/4/2010

ID: RFD.2663.6
DC ID: 7091

1317
Adj

LINDA LINGLE
GOVERNOR OF HAWAII

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

MA-11-79

RECEIVED
2010 OCT 27 A 10:29
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

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

RECEIVED
2010 OCT 25 P 3:33
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

RECEIVED
OFFICE OF CONSERVATION & COASTAL LANDS

October 25, 2010

MEMORANDUM

TO: FROM

DLNR Agencies:

x Div. of Aquatic Resources
__ Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
(x) Office of Conservation & Coastal Lands
x Land Division – Maui District

TO: FROM: Charlene Unoki, Assistant Administrator Charlene

SUBJECT: Draft Environmental Assessment for the Kolea Reservoir (Hi00097) Removal Project

LOCATION: Island of Maui

APPLICANT: Oceanit on behalf of DLNR

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by November 5, 2010.

Only 1 copy of the report available in Room 220.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed: M. Mc

Date: 25 OCT 2010

LINDA LINGLE
GOVERNOR OF HAWAII

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

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

PAUL J. CONRY
ACTING FIRST DEPUTY

LENORE N. OHYE
ACTING DEPUTY DIRECTOR - WATER

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

REF:OCCL:AB

Correspondence: MA-11-79

OCT 25 2010

MEMORANDUM

TO: Charlene Unoki, Assistant Administrator
Land Division

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

SUBJECT: Draft Environmental Assessment for Kōlea Reservoir Removal
LOCATION: Hāna, Maui, TMK: (2) 1-1-001:050
APPLICANT: Oceanit for State Department of Accounting and General Services

---

The Department of Land and Natural Resources, Office of Conservation and Coastal Lands (OCCL) has reviewed the Draft Environmental Assessment (DEA) for the Kōlea Reservoir removal project, located at Hāna, Maui, TMK: (2) 1-1-001:050.

According to the DEA, the Kōlea Reservoir, which is no longer needed for storage of stream water for irrigation, will be removed and restored to a natural stream. The reservoir will be graded to form a 15-foot wide channel with 2:1 slope sides, which will be grassed. Check dams will be installed every 50 feet up to the location where the stream enters the existing reservoir. These check dams and grassing are expected to reduce the amount of sediment traveling downstream. In addition, a grouted riprap apron wall will be constructed to direct the flow downstream.

According to OCCL records, there has been no previous Conservation District Use Application (CDUA) filed for the subject parcel. The subject parcel is located within the State Land Use Conservation District, Protective and Resource Subzones.

In our previous correspondence to the applicant (Correspondence file: MA-10-229), dated May 18, 2010, the OCCL stated that:

> *The removal of the reservoir and dam is identified land use in the Conservation District pursuant to Hawai'i Administrative Rules (HAR) §13-5-22 Identified Land Uses in the Protective Subzone, P-9 STRUCTURES, EXISTING, (C-1) Demolition, removal, or alteration of existing structures, facilities, and equipment. Any historic property shall be evaluated by the department for historical significance.*

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 4 2011

PM-3039.1

Mr. Russell Y. Tsuji
Administrator
Land Division
Department of Land and Natural Resources
State of Hawai'i
P.O. Box 621
Honolulu, Hawai'i 96809

Dear Mr. Tsuji:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of November 8, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment (EA) for the Kōlea Reservoir removal and for circulating the document for comments from the other Divisions.

We acknowledge that the site is within Flood Zone X and does not have any regulations for development.

A Conservation District Use Application (CDUA) will be submitted to the Office of Conservation and Coastal Lands as soon as the Final EA has been published. Page 39 of the Draft EA lists the CDUA as a requirement for this project. We will review Chapter 13-5 HAR and the CDUA requirements for incorporation into the EA.

The State Historic Preservation Division (SHPD) has been consulted and will review the documentation provided in the Draft EA. SHPD is reviewing the Architectural Inventory Survey (AIS) for adequacy of documentation before the dam features are removed.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc. ✓

In exploring these questions, we also noted some omissions, overgeneralization, and inconsistency with regard to existing planning processes, instream uses, and biologic and hydrographic characteristics of Kolea Stream. Please note that many of these concerns could be alleviated in the Final EA by liberally referencing the *Instream Flow Standard Assessment Report for Punalau Stream*, completed in 2009 by the State of Hawaii Commission on Water Resource Management, *available at* http://hawaii.gov/dlnr/cwrm/ifsar/PR200904.pdf, and related information, *see* http://hawaii.gov/dlnr/cwrm/currentissues_EastMauiIIFS.htm#punalau.

Housekeeping

The document would benefit from thorough spell checking, proofreading, and editing, as there are numerous typographical errors, grammatical mistakes, and lapses in style and organization throughout the document.

A lot of useful information is buried in the appendices where it is not readily available to all readers and is not easily understood by the non-engineering public. We suggest that the preparers extract summaries of this information and daylight it within the main body of the Final EA, using lay terms and simplified graphics. For example, Appendix B—which is unpaginated and has no table of contents—includes sketches that illustrate the reservoir and spillway features, which would be a helpful addition to the project description in the main body of the document.

In order to further assist the reader, we also suggest (1) pagination of the entire document; (2) tables of contents for the appendices that are reproduced within the main table of contents (p. iv); (3) adding tables and figures from the appendices to the main lists of tables and figures in the table of contents (p. iv); and (4) a bibliography that compiles references from the main document and the appendices into a single section (p. 41).

In order to maintain consistency with the language of Hawaii Revised Statutes (HRS) Chapter 343 and Hawaii Administrative Rules Chapter 200, we suggest that the DLNR be identified as the "Proposing Agency" and "Determining Agency," rather than as the "Applicant," and "Approving Agency" (p. v). Within the regulatory framework established by the statute and rules, the term "Applicant" is reserved for "any legal entity other than an agency," and the term "Approving" is more properly used to refer to an agency's exercise of its discretionary consent in matters other than the issuance of a negative declaration or the acceptance of an environmental impact statement under HRS 343.

In addition to our general comments, we have a few specific comments:

Project purpose, cost, and responsibilities

Purpose

The Draft EA states that the reservoir "is no longer needed for storage of stream water for irrigation and will be removed and restored to a natural stream" (p. 5) and "agricultural irrigation is no longer needed from this reservoir" (p. 33). It also states that "[w]ater from this reservoir is no longer needed for irrigation, so the reservoir will be removed to allow Kolea Stream to flow downstream without any obstructions" (p. 7). However, there are additional components of the irrigation system, upstream and downstream from the project site, that impair the stream's ability to flow to the sea unobstructed. The flow of Kolea Stream is obstructed/diverted at two locations mauka of the reservoir, and at one location just below the reservoir. As noted in the Draft EA, "[t]he diversion structure [below Kolea Reservoir] is owned by EMI and will remain as part of the irrigation system according to the State Water Commission's decision released on May 28, 2010" (p. 1). Unfortunately, the Draft EA fails to mention that this decision allows EMI to continue the status quo of water diversion at three locations in Kolea Stream. Therefore, it appears that although storage of stream water in the reservoir "has little current economic value . . ." (Appendix B, fifth unnumbered page), water from the regraded channel that would replace the reservoir is still needed for irrigation. To help clarify the situation, we suggest that the Final EA provide direct quotations of the pertinent language from the State Water Commission's decision, instead of merely alluding to it.

The cumulative diversion of Kolea Stream calls into question the viability of stream restoration efforts, as does the lack of information about substrate characteristics of the regraded channel and the "naturalness" of grass plantings and check dams. We suggest that the Final EA clarify how EMI plans to operate its Kolea Stream diversions and how this fits with DLNR's stream restoration plans. Would there be continuous perennial flow through all stream segments? How much streamflow would be diverted, and how much would reach the ocean via Kolea Stream, across a range of flow regimes and timescales? Without this information, it is hard to understand how "[t]he reservoir remediation will return the stream to its natural state for future generations to enjoy" (p. 33). Why is Kolea Stream a better candidate for restoration than other streams that are more amenable to native species migration?

Cost

Page 11 of the Draft EA may reveal the driving purpose of the dam removal project, to avoid future maintenance and inspection costs. This suggests that the reservoir has negative—not "little"—economic value. Therefore, we suggest that the Final EA disclose the economic valuation used to determine that "abandonment would be the best course of action" (*Id.*), including cost estimates for both dam removal and dam retention. This information would be useful statewide, as many other dams are facing similar situations.

Responsibilities

The Draft EA states that DLNR and EMI jointly proposed to decommission the reservoir (Appendix B, fifth unnumbered page). In order to provide greater transparency about the situation, we suggest that the Final EA disclose which party is responsible for (1) dam maintenance and inspection, (2) the costs of dam removal, and (3) ongoing stream restoration and long-term maintenance of the regraded/breach channels. Private industry paid for and profited from dam construction and water diversion, yet it appears that the state is removing the dam at taxpayer expense (p. 1, "[t]he DLNR will be removing the reservoir . . . "). If so, this would be a case that allowed the commodification of water for private profit for well over a century, while now socializing the cost of remediation. Such a potentially significant impact deserves to be addressed in the Final EA.

Stream restoration objectives and streamflow and sediment regimes

The U.S. Army Corps of Engineers recommended that the EA "characterize the hydrology and ecology" of streams and wetlands, and "provide a cross-section of the proposed work and the existing conditions at the proposed project location. Your EA should include Best Management Practices [BMPs] proposed to mitigate the negative impacts to any aquatic environment and a thorough discussion of project alternative that were considered" (Appendix F). Although there is some detailed information about construction-related BMPs in Appendix E, some critical baseline information is either missing altogether or could be recrafted and made accessible to readers of the main section of the EA. Mere statements that "[b]est management practices for stream restoration will be followed during the decommissioning process of Kokea Reservoir" are insufficient (p. 22). We suggest that the main section of the Final EA provide more details about these BMPs, and, more importantly, about the BMPs that will be used over the lifetime of the stream restoration effort.

What is the current storage capacity of the reservoir, and how much sediment is accumulated on the reservoir bed and banks? The rating curve presented on Existing Site Plan EG1 is a starting point for this analysis, but doesn't tell the whole story. Would the sediment all be redistributed on-site, or would some of it need to be moved off-site? What is the sediment load carried by the stream into the reservoir, and how much of this load would accumulate behind the proposed check dams? While this could prevent sediment from moving downstream during less extreme flow events, unless the check dams are maintained they could serve as a source of excessive sediment loading during more extreme flow events. The reservoir has been acting as a sediment sink, and it may not be true that "[t]he remediation project will actually reduce the loss of topsoil into the ocean . . ." (p. 36). Would the check dams present a barrier to the migration of native stream organisms?

Baseline information about stream hydrology and habitat availability is available in various reports published by the U.S. Geological Survey and the State of Hawaii Commission on

Water Resource Management. We suggest that the preparers consult these reports and their own engineering information to more completely identify, in the Final EA, pre-reservoir conditions, existing conditions, post-reservoir conditions, and stream restoration target conditions. A schematic and graphical depiction of this progression would be quite helpful. Please clarify whether or not the existing spillway will be removed, and why aligning the regraded stream to flow through the existing spillway would not be a viable alternative.

Existing planning processes

The Draft EA does not reference or address a number of planning processes under the Hawaii Water Plan (State of Hawaii Commission on Water Resource Management) and other agency and community efforts that appear to be relevant to the proposed action. At the same time, the Social and Economic Factors section (pp. 27-28) provides generic demographic information for the County of Maui, including population, ethnicity, and housing values, but no specific data for the project site. It is unclear why island-wide data is of any use in this Draft EA.

We suggest that the preparers consider the following processes and explain, in the Final EA, their relationships with the proposed action:

- State Water Resources Protection Plan
- State Water Resources Development Plan
- State Agricultural Water Use & Development Plan
- State Water Quality Plan
- State Aquatic Invasive Species Plan
- Hawaii's Implementation Plan for Polluted Runoff Control (Department of Health)
- Hawaii Coastal Nonpoint Pollution Control Program Management Plan (Office of Planning)
- Maui County Water Use & Development Plan
- East Maui Watershed Partnership Watershed Protection Program

Mauka segments of Kolea Stream, including the two diversions above Kolea Reservoir, appear to be Class 1.b. waters under the state water quality standards. Any portion of the proposed project site that lies within the Protective Subzone (*see* Pre-Consultation letter from DLNR Office of Conservation and Coastal Lands, Appendix F) also harbor Class 1.b. waters. Because the protected uses of Class 1 waters include protection of native breeding stock, we suggest that the Draft EA discuss how the proposed action would contribute to the protection and restoration of Class 1 uses above the reservoir site. With regard to cultural resource planning, page 36 of Appendix A recommends "a minimum of an Architectural Inventory Survey . . . the level of recordation to be determined in consultation with the SHPD Historic Architecture Branch." A comment letter from SHPD in Appendix F recommends that a Historic American Engineering

Report and an Architectural Inventory Survey Report be submitted for the site. Appendix B includes an Architectural Inventory Survey Report that does not bear a SHPD Doc Number, and does not include a Historic American Engineering Report. Does this Report meet the level of recordation determined in consultation with SHPD? As a matter of practice, wouldn't it be prudent to wait for SHPD to complete its reviews and approvals before publishing the Draft EA?

Instream uses and biologic and hydrographic characteristics

The Archaeological and Cultural Surveys (Appendix A) provide interesting historic information but do not make use of readily available materials concerning contemporary native Hawaiian beliefs, values, and practices in Kolea Stream. We suggest that Final EA include reference to and evaluation of the information held in (1) the statewide Registration of Water Sources and Declaration of Water Uses collected in the late twentieth century by the State of Hawaii Commission on Water Resource Management, and (2) the testimonies about East Maui instream uses submitted to the Commission in 2001 by the Native Hawaiian Legal Corporation. Information from both of these sources is summarized in the *Instream Flow Standard Assessment Report for Punalau Stream, available at* http://hawaii.gov/dlnr/cwrm/ifsar/PR200904.pdf.

An email from the U.S. Fish & Wildlife Service offered to assist the preparers in identifying appropriate survey methods and data regarding the historical or current presence of native stream species, and in conducting stream or riparian habitat surveys (Appendix F). However, the biological surveys reported in Appendix C do not provide the level of baseline information that would be expected in order to conduct a stream restoration project. We suggest that the proposing agency conduct the Hawaii Stream Bioassessment Protocol on Kolea Stream and report the results in the Final EA. This methodology establishes a baseline level of stream habitat quality and stream biotic integrity that can be reassessed over time, thus serving as an indicator of the success or failure of long-term efforts to restore native stream habitat, flora, and fauna.

Appendix C and the *Instream Flow Standard Assessment Report for Punalau Stream* present conflicting information about (1) the presence of native species in Kolea Stream, and (2) the ocean terminus of the stream channel (waterfall or not?). We suggest that these inconsistencies be rectified in the Final EA, and note that some of them may have occurred due to the dual naming of the stream. We suggest that the preparers also consult the *Report on Punalau Stream, Maui, Hawaii*, produced in 2009 by the DLNR Division of Aquatic Resources and the Bernice Pauahi Bishop Museum, *available at* http://hawaii.gov/dlnr/cwrm/currentissues/iifsmaui1/dar-6050.pdf

Thank you for the opportunity to comment on this Draft Environmental Assessment. When the Final EA is distributed, please send two printed copies to the Environmental Center.

Sincerely,

John Cusick
Environmental Review Coordinator

cc: State of Hawaii Office of Environmental Quality Control (OEQC)
Chittaranjan Ray, Interim Director, Water Resources Research Center, UH Manoa
Derrick Elfalan, Senior Projects Engineer, Oceanit Laboratories, Inc.
Davianna McGregor
David Penn

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

MAR 4 2011

PM-3038.1

Mr. John Cusick
Environmental Review Coordinator
Environmental Center
University of Hawai'i
2500 Dole Street, Krauss Annex 19
Honolulu, Hawai'i 96822

Dear Mr. Cusick:

Subject: Draft Environmental Assessment (DEA)
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of November 22, 2010 for the subject project. The responses follow the same ordering used in your letter.

3rd Paragraph

1. The project is paid for by the State of Hawai'i, contracted by the Department of Accounting and General Services (DAGS) on behalf of the Department of Land and Natural Resources (DLNR). The cost for removing the dam is approximately $700,000.
2. There is no long-term maintenance planned. After removal of the dam the stream channel will be allowed to revert to its natural state.
3. The objective of the project is to remove the dam and reservoir. This will be achieved by demolishing the dam appurtenant equipment and grading a breach in the dam. The stream channel currently inundated by the reservoir or covered by the dam embankment will be restored to a more natural condition.
4. The stream flow will not change significantly. The reservoir is small and during rainfall events, water is released over the spillway. After construction is completed and the vegetation is re-established it is not anticipated that the sediment regime will change significantly.

4th Paragraph

Thank you for the Punalau Stream reference. There are two (2) streams named Kōlea in the immediate area. The Kōlea tributary to Punalau is not the correct stream.

5th Paragraph

Your comments on proofreading will be incorporated throughout the document.

6th Paragraph

Brief summaries of the technical reports attached to the DEA are already included in the text. We will paginate Appendix B and add more graphics to the Final Environmental Assessment (FEA) text.

7th Paragraph

Thank you for these comments. We will consider them for the FEA.

8th Paragraph

Thank you for these comments. We will correct the inconsistencies. The proposing agency is the DAGS and the approving agency is the DLNR.

9th Paragraph

We acknowledge that there are other components to the East Maui Irrigation Company (EMI) ditch system. These components are not part of this project and are not relevant to the Environmental Assessment (EA). Please note that the two upstream diversions that you refer to are on the Kōlea-Punalau Stream, an entirely different stream. This is a dam safety project and the purpose of the project is to remove the Kōlea Reservoir. The project is not related to the on-going implementation of the interim instream flow standards (IIFS) in East Maui.

10th Paragraph

The operation of EMI's diversions is not relevant to the dam removal project. The reservoir-dam is being removed because the structure is no longer needed by the landowner (State of Hawai'i) or Lessee (EMI). The Kōlea Stream was not included in the recent Commission on Water Resource Management decision on IIFS in East Maui streams; therefore, it is not

necessary to discuss its relation with the DLNR stream restoration plans. In this case, "stream restoration" means the restoration of the channel and elimination of the artificial impoundment. There will be no measurable impact on low flow stream discharge. The intent of the project is to remove the Kōlea Reservoir-Dam. There is no intent to restore stream flow. During the process of removing the dam embankment the channel will be restored to a more natural state.

11th Paragraph

A formal economic valuation was not conducted. The reservoir-dam is being removed because the structure is no longer needed by the landowner (State of Hawai'i) or Lessee (EMI).

12th Paragraph

(1) Under their revocable permit agreement with the State of Hawai'i, East Maui Irrigation (Alexander & Baldwin) is responsible for the operation and maintenance of the reservoir. The State of Hawai'i owns the land and leases it to EMI. (2) The State will pay for the dam removal. (3) No maintenance of the stream channel will be necessary after the dam is removed. Although the lessee is responsible for the maintenance of the dam, the landowner (State of Hawai'i) also has an interest in the structures on the property. The use of public funds to remove the dam is not "socialization," but merely the State assuming responsibility for State lands. This does not represent "socializing" the cost of remediation.

13th Paragraph

We will include more discussion of best management practices in the FEA.

14th Paragraph

The maximum operating storage of Kōlea Reservoir is about 8 million gallons. The volume of sediment retained in the reservoir is not known. Inspections of the basin when the reservoir is near empty did not reveal excessive amounts of sediment. Sediment in the reservoir basin will not be disturbed. It will be stabilized with grass and will eventually be overgrown by the bamboo currently around the reservoir perimeter. The check dams will serve to retard the movement of soil as stream vegetation is reestablished. They are not intended to prevent soil from being transported downstream during extreme flow events. The check dams are not expected to be a barrier for migration of native stream organisms.

15th Paragraph

There is no available baseline flow condition data for the Kōlea Stream in the U.S. Geological Survey (USGS) records or in Commission on Water Resource Management (CWRM) records. The preparers have already consulted the available USGS and CWRM records.

The existing spillway will not be removed. It was cut into the rock on the left abutment of the dam. Aligning the stream along the spillway would be a potentially viable but more expensive alternative. Approximately 22 vertical feet of rock would have to be excavated along the spillway alignment. This would be more difficult and expensive then removing the artificial dam embankment. In addition, it is also not known if the DLNR Dam Safety Office would allow the embankment to be left in place.

16th Paragraph

We will include demographic information for the immediate area. Please note that there is nobody living in the immediate project area.

17th Paragraph

This DEA is for a dam removal project. It does not relate to the IIFS implantation in East Maui. It is not necessary to relate the project to the plans listed in this paragraph.

18th Paragraph

The project probably will not affect the protection or restoration of Class 1 water uses above the reservoir site. Removing the dam will remove one barrier on the stream, but the stream diversion downstream from the reservoir will remain in place.

The Architectural Inventory Survey Report meets the level of recordation required by the State Historic Preservation Division. A Historic American Engineering Report is not appropriate for this structure.

19th Paragraph

1) Water use registration data for the Kōlea Stream will be included in the FEA.
2) As noted earlier, the testimony and IIFS report for Punalau Stream is not relevant to the project. The Punalau-Kōlea Stream is a different stream from the project Kōlea Stream.

20th Paragraph

A more detailed biological survey is not necessary. The survey conducted is adequate for the dam removal project. No post-project monitoring is contemplated.

21st Paragraph

There is no conflicting information. As noted earlier the Punalau Stream is a different stream from the project Kōlea Stream and the information presented for Punalau is not directly comparable with the project area.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc. ✓
DLNR; Russell Tsuji, Administrator

APPENDIX A

Archaeological & Cultural Surveys

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

July 27, 2010

Hallett H. Hammatt, Ph.D.
Cultural Surveys Hawai'i, Inc.
PO Box 1114
Kailua, Hawaii 96734

LOG NO: 2010.1975
DOC NO: 1007MD27
Archaeology

Dear Dr. Hammatt:

SUBJECT: Chapter 6E-8 Historic Preservation Review –
Archaeological Inventory Survey of Four Acres with One New Site
Kolea Ahupua'a, Hāna District, Island of Maui
TMK: (2) 1-1-001:050 (por.)

This letter reviews the aforementioned report (McCurdy and Hammatt March 2010*; Archaeological Inventory Survey Report for the Kolea Reservoir Decommissioning Project, Kolea Ahupua`a, Hana District, Maui Island, TMK: [2] 1-1-001:050; CSH Job Code: MAKAIWA 1*), which we received on May 10, 2010. We apologize for the delay in our reply.

The project area of the survey encompasses the Kolea Dam, newly recorded as SIHP 50-50-13-6683, a Plantation-era reservoir that was hand-constructed in 1910. It is being decommissioned as a water storage facility at this location because it is no longer needed.

This was the first reservoir built following the annexation of Hawaii by the United States in 1898. It has been recommended significant under criteria "a" (association with a period of great change in Hawaii followed by an influx of immigrant contract labors due to the water availability for improved crop yields); "c" (for its distinctive style and hand-built construction); and "d" for information important to the understanding of water diversion techniques and structures employed during the early plantation period on Maui. We concur with these recommendations. We also agree that the next step is to begin an architectural inventory survey in consultation with our Architecture Branch.

This report is approved as final pursuant to HAR §13-276. Upon receipt of this letter please submit one paper copy of your plan marked "Final" to our Kapolei office along with a CD containing a searchable pdf version of the final report and a copy of this approval letter, marked to the attention of the "**Kapolei Library.**" If you have questions about this letter please contact Morgan Davis at (808) 896-0514 or via email to: morgan.e.davis@hawaii.gov.

Aloha,

Theresa K. Donham
Acting Archaeology Branch Chief
State Historic Preservation Division

Archaeological Inventory Survey Report for the Kolea Reservoir Decommissioning Project, Kolea Ahupua‘a, Hāna District, Maui Island TMK: [2] 1-1-001:050

Prepared for
Oceanit Laboratories, Inc.

FINAL

Prepared by
Todd C. McCurdy, M.A.
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawai‘i, Inc.
Kailua, Hawai‘i
(Job Code: MAKAIWA 1)

March 2010

O‘ahu Office
P.O. Box 1114
Kailua, Hawai‘i 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Maui Office
1993 Main Street
Wailuku, Hawai‘i 96793
Ph: (808) 242-9882
Fax: (808) 244-1994

Management Summary

<table>
<tr><td>Reference</td><td>Archaeological Inventory Survey Report for the Kolea Reservoir Decommissioning Project, Kolea Ahupua’a, Hāna District, Maui Island, TMK: [2] 1-1-001:050 (McCurdy and Hammatt 2010)</td></tr>
<tr><td>Date</td><td>March 2010</td></tr>
<tr><td>Project Number (s)</td><td>Cultural Surveys Hawai‘i Inc. (CSH) Job Code: MAKAIWA 1</td></tr>
<tr><td>Investigation Permit Number</td><td>The fieldwork component of the archaeological inventory survey documentation was carried out under archaeological permit # 10-10 issued by the Hawai‘i State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR), per Hawai‘i Administrative Rules (HAR) Chapter 13-282.</td></tr>
<tr><td>Project Location</td><td>The project area is approximately 430 m southwest of the Waikamoi Forest Ridge trailhead and is accessed by way of a locked gate in the parking area for the trail.</td></tr>
<tr><td>Land Jurisdiction</td><td>State Ownership, Department of Land and Natural Resources (DLNR). Leased by East Maui Irrigation Company, Ltd. (EMI)</td></tr>
<tr><td>Agencies</td><td>State: Hawai‘i Department of Land and Natural Resources</td></tr>
<tr><td>Project Description</td><td>The current project involves the decommissioning of the Kolea Reservoir as the water storage is no longer necessary.</td></tr>
<tr><td>Project Acreage</td><td>4 acres (1.6 ha)</td></tr>
<tr><td>Area of Potential Effect (APE) and Survey Acreage</td><td>The project area’s Area of Potential Effect (APE) is defined as the immediate area of ground disturbance. The APE in this instance is defined as the entire project area, approximately 4 acres (1.6 ha).</td></tr>
<tr><td>Historic Preservation Regulatory Context</td><td>This document was written in accordance with Hawai‘i Administrative Rules (HAR) 13-276 and Chapters 6E-7 and 8.</td></tr>
<tr><td>Fieldwork Effort</td><td>The fieldwork component of the archaeological inventory survey was accomplished on February 23 and 24, 2010 by CSH archaeologists, Todd McCurdy, M.A. and Robert Hill, B.A., under the general supervision of Hallett H. Hammatt, Ph.D. The fieldwork required approximately 20 person-hours to complete. The inventory survey documentation included site recordation of the Kolea Reservoir and associated features.</td></tr>
<tr><td>Number of Historic Properties Identified</td><td>One Historic Property was identified during this investigation.</td></tr>
<tr><td>Historic Properties Recommended Eligible to the Hawai‘i Register of Historic Places (Hawai‘i Register)</td><td>
<table>
<tr><th>SIHP 50-50-13-</th><th>Site Type</th><th>Function</th><th>Age</th><th>Significance Criteria</th></tr>
<tr><td>6683</td><td>Plantation Reservoir</td><td>Water Diversion</td><td>Plantation era</td><td>A, C, and D</td></tr>
</table>
</td></tr>
<tr><td>Historic Properties Recommended Ineligible to the Hawai‘i Register</td><td>None observed</td></tr>
</table>

<table>
<tr><td>Effect Recommendation</td><td colspan="6"><table>
<tr><th>SIHP 50-50-13-</th><th>Site Type</th><th>Age</th><th>Significance Criteria</th><th>Recommendations</th></tr>
<tr><td>6683</td><td>Plantation Reservoir</td><td>Plantation era</td><td>A,C,D</td><td>A minimum of Architectural Inventory Survey Report Documentation.</td></tr>
</table></td></tr>
<tr><td>Mitigation Recommendation</td><td colspan="6">Cultural Surveys Hawai‘i recommends a minimum of an Architectural Inventory Survey of SIHP 50-50-13-6683 prior to any alteration, the level of recordation to be determined in consultation with SHPD Historic Architecture Branch.</td></tr>
</table>

Table of Contents

List of Figures

List of Tables

Section 1 Introduction

1.1 Project Background

At the request of Oceanit Laboratories, Inc., Cultural Surveys Hawai‘i, Inc. conducted an archaeological inventory survey for the Kolea Reservoir Decommissioning Project, Kolea Ahupua‘a, Hāna District, Maui Island, TMK (2) 1-1-001:050 (Figure 1 and Figure 2). The intent is to breach the existing dam and restore the reservoir to a natural looking environment because it has been determined that the water storage is no longer necessary. The area of potential effect (APE) is approximately 4 acres, and is hereafter referred to as the project area.

1.2 Scope of Work

The following archaeological inventory survey scope of work is designed to satisfy the Hawai‘i state requirements for archaeological inventory surveys (Hawai‘i Administrative Rules [HAR] Chapter 13-276 and Chapter 13-275/284):

1) Historic and archaeological background research, including a search of historic maps, written records, Land Commission Award documents, and the reports from prior archaeological investigations. This research will focus on the specific project area’s past land use, with general background on the pre-contact and historic settlement patterns of the *ahupua‘a* and district. This background information will be used to compile a predictive model for the types and locations of historic properties that could be expected within the project area.

2) A complete (100 %) systematic pedestrian inspection of the project area to identify any potential surface historic properties. Surface historic properties will be recorded with an evaluation of age, function, interrelationships, and significance. Documentation will include photographs, scale drawings, and, if warranted, limited controlled excavation of select sites and/or features.

3) As appropriate, consultation with knowledgeable individuals regarding the project area’s history, past land use, and the function and age of the historic properties documented within the project area.

4) As appropriate, laboratory work to process and gather relevant environmental and/or archaeological information from collected samples.

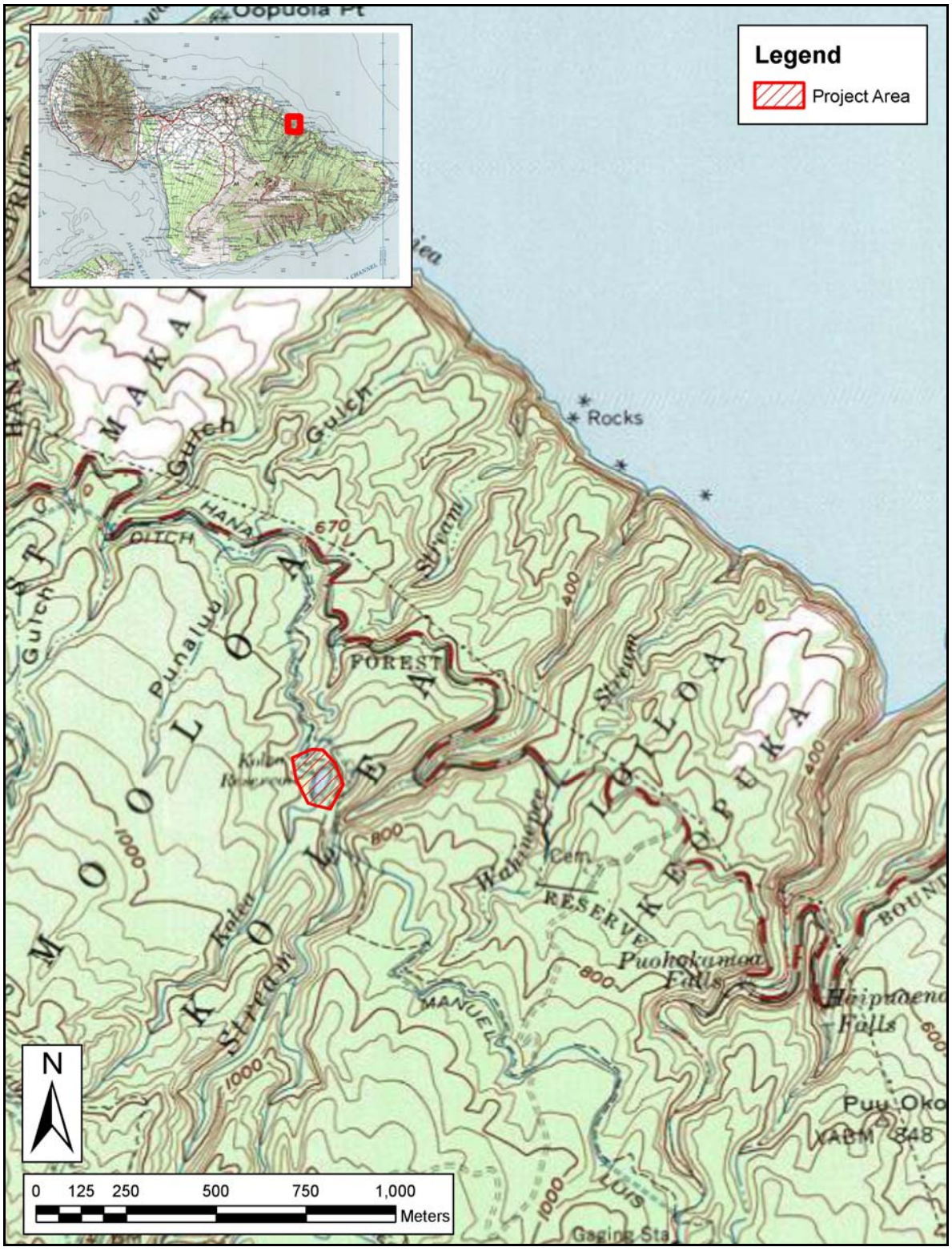


Figure 1. A portion of the USGS 7.5’ topographic map, Keanae Quadrangle (1983) showing the project area.

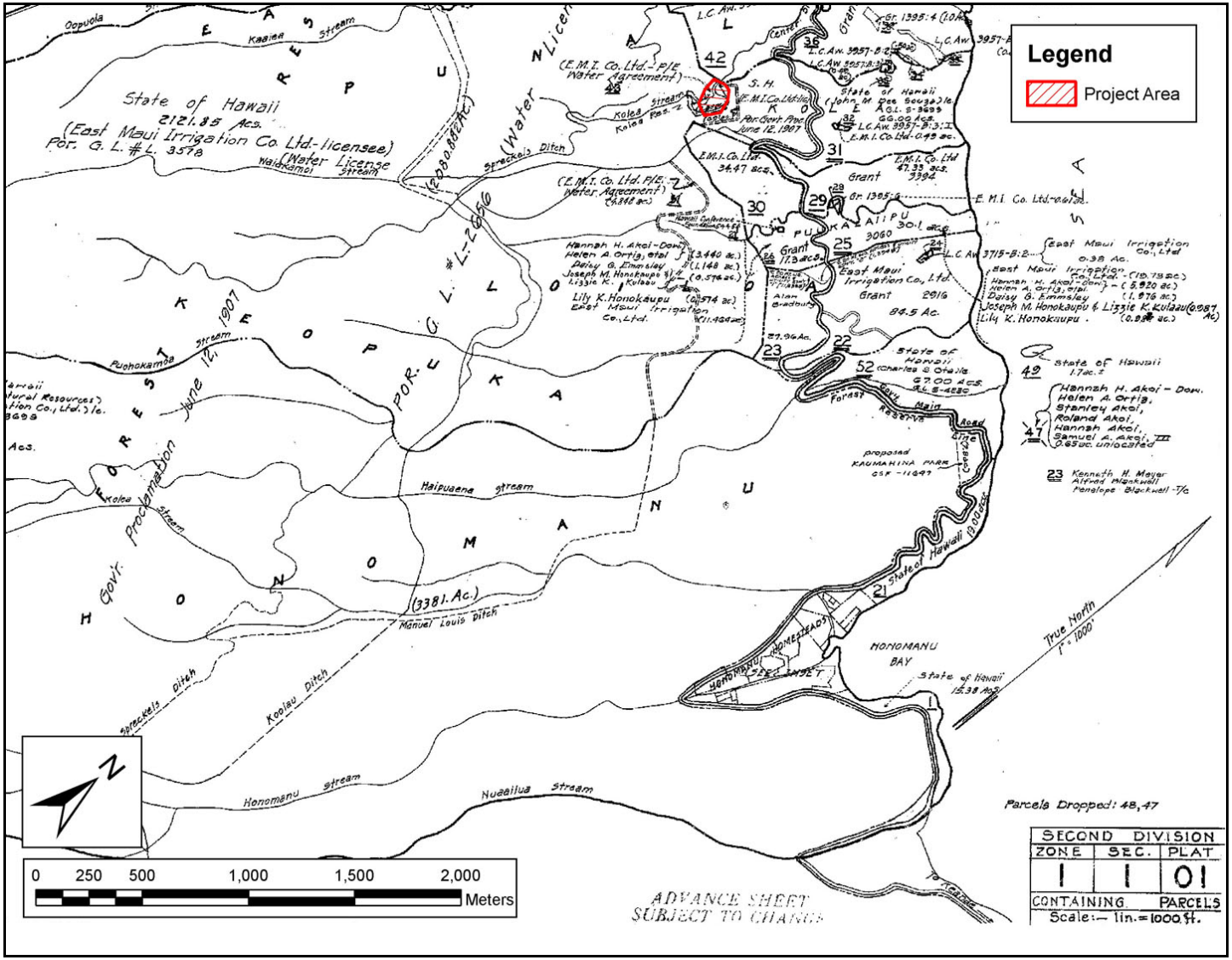


Figure 2. A portion of TMK (2) 1-1-001 showing the location of the project area.

5) Preparation of an inventory survey report, which will include the following:
   a) A project description;
   b) A section of a USGS topographic map showing the project area boundaries and the location of all recorded historic properties;
   c) Historical and archaeological background sections summarizing prehistoric and historic land use of the project area and its vicinity;
   d) Descriptions of all historic properties, including selected photographs, scale drawings, and discussions of age, function, laboratory results, and significance, per the requirements of HAR 13-276. Each historic property will be assigned a Hawai‘i State Inventory of Historic Properties number;
   e) If appropriate, a section concerning cultural consultations [per the requirements of HAR 13-276-5(g) and HAR 13-275/284-8(a) (2)].
   f) A summary of historic property categories, integrity, and significance based upon the Hawai‘i Register of Historic Places criteria;
   g) A project effect recommendation;
   h) Treatment recommendations to mitigate the project’s adverse effect on any historic properties identified in the project area that are recommended eligible to the Hawai‘i Register of Historic Places.

This scope of work includes full coordination with the State Historic Preservation Division/Department of Land and Natural Resources (SHPD/DLNR) and Maui County relating to archaeological matters. This coordination takes place after consent of the owner or representatives.

Part of the SHPD/DLNR mandated scope of work for an archaeological inventory survey includes specific documentation of located historic properties. This documentation includes recording their geographic location with a GPS on project area maps and written descriptions and may include, as appropriate, sampling, section drawings and profiles, plan views, and photographs. For traditional Hawaiian deposits, this can include analysis of recovered artifacts and midden. It often also includes radiocarbon dating of samples from cultural contexts. If historic-era deposits are located, then analysis of associated historic artifacts is often required.

1.3 Environmental Setting

1.3.1 Natural Environment

Kolea Ahupua‘a is located in between Mo‘oloa Ahupua‘a to the west and Loiloa Ahupua‘a to the east. The Kolea Reservoir is located along Kolea Stream at the 800-foot contour and approximately 1.15 kilometers from the coastline (Figure 1). Soils in the area are described as Rough Mountainous Land (rRT) (Figure 3). Occurring in mountainous areas throughout the Hawaiian Islands, it consists of very steep land broken up by numerous intermittent drainage channels. The stratigraphy is generally 0-25 cm of soil over saprolite. (Foote et al. 1972:119).

The average rainfall in the vicinity of the project area is between 120” and 160” with the heaviest rainfall occurring in the winter months (Giambelluca et al. 1986:57). In this region of the island the soil type and precipitation rate support a wet forest and woodland ecosystem (Pratt and Gon 1998). As a result of land alteration associated with water diversion the ecosystem has been modified. The current environment around the Ko‘lea Reservoir consists of introduced florae including Swamp mahogany (*Eucalyptus robusta*), Chinese banyan (*Ficus microcarpa*), Paperbark (*Melaleuca quinquenervia*) and Moreton Bay fig (*Ficus Macrophylla*).

1.3.2 Built Environment

The built environment consists of a reservoir and associated dam constructed in 1901 (Figure 4). A wood-framed catwalk extends from the crest of the dam approximately 12 m straight out into the reservoir with a control wheel at its end, presumably to open and close the outlet. The exiting water is re-directed from Kolea Stream into the center ditch for the purpose of irrigation. An access road that begins near the Waikamoi Forest Ridge trailhead ends atop the crest of the dam.

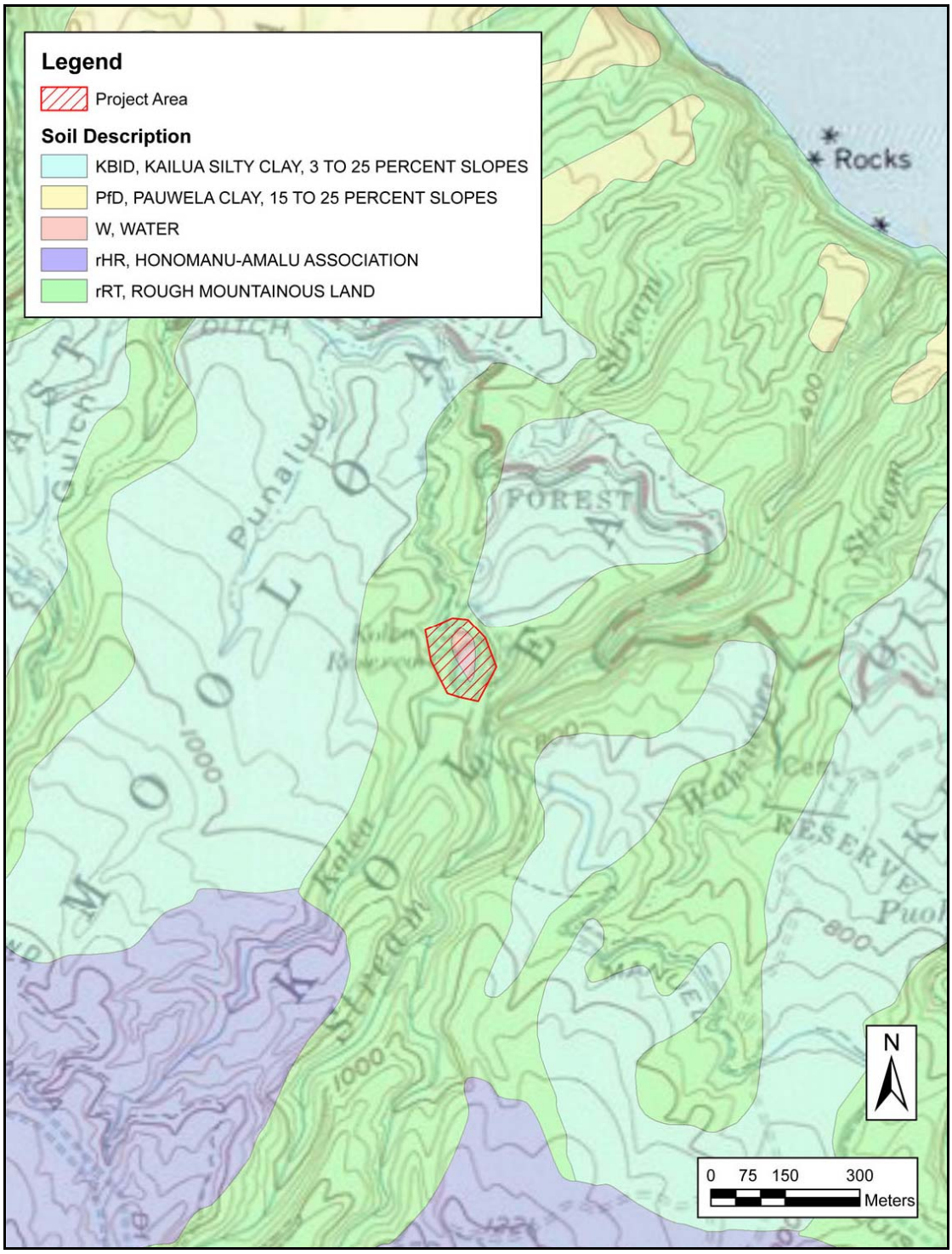


Figure 3. A portion of the 1983 Ke‘anae 7.5-minute USGS topographic quadrangles, showing the project area and related local soil series (U.S. Department of Agriculture, Natural Resources Conservation Service 2001).

Figure 4. Overview of the Kolea Reservoir, view to north.

Section 2 Methods

2.1 Field Methods

The fieldwork component of the archaeological inventory survey was accomplished on February 23 and 24, 2010 by CSH archaeologists, Todd McCurdy, M.A. and Robert Hill, B.A., under the general supervision of Hallett H. Hammatt, Ph.D. The fieldwork required approximately 20 person-hours to complete. The inventory survey documentation included site recordation of the Kolea Reservoir and associated features.

2.1.1 Site Recordation

Archaeological documentation included:

1. Mapping to scale using a tape and compass
2. Detailed written descriptions
3. Photographic documentation using an Olympus Stylus 780, resolution 7.1 megapixels
4. Site location through GPS data collection

2.2 Document Review

Background research included a review of previous archaeological studies and mitigation plans on file at SHPD/DLNR and a review of documents, books and maps at the Cultural Surveys Hawai‘i library. Land Commission Award documentation was researched using the Waihona ‘Āina online database and previous reports. Additionally, documents, books and maps were consulted at the Maui Historical Society and Wailuku Public Library. Other sources such as the World Wide Web were utilized as needed.

Section 3 Background Research

The division of Maui's lands into political districts occurred during the rule of Kaka‘alaneo, under the direction of his *kahuna*, Kalaiha‘ōhi‘a (Beckwith 1970:383). This division resulted in twelve districts during traditional times: Honua‘ula, Kahikinui, Kaupō, Kīpahulu, Hāna, Ko‘olau, Hāmākua Loa, Hāmākua Poko, Wailuku, Ka‘anapali, Lahaina, and Kula. The current project area is located on the windward flank of Haleakalā in the traditional district or *moku* of Ko‘olau and *ahupua‘a* of Kolea.

This section contains a summary of the rich traditional historic background associated with the Ko‘olau Moku. In addition, this section details the previous archaeological investigations in the vicinity of the current project area. It concludes with a background summary and predictive model.

3.1 Traditional and Historical Background

3.1.1 Mythological and Traditional Accounts

Ko‘olau Moku, on the northeast coast of Maui is located in between Hāmākua Loa Moku to the west and Hāna Moku to the south. A translation of *Ko‘olau* is "windward" (Pukui et al. 1974:117). Although Ko‘olau Moku extends from O‘opuola Pt. to beyond Nihuku, the lands from Ke‘anae to Wailua are considered to be representative of the traditional cultural landscape for the Ko‘olau region as a whole (Handy and Handy 1997:499-501).

Oral tradition passed from down from one generation to the next provides valuable insight into the pre-Contact cultural landscape of Ko‘olau Moku. The waters that feed this verdant region were said to have been brought forth by the god Kāne, who thrust his *kauila* staff into solid rock to bring forth the waters of Ke‘anae (Beckwith 1970:64). Another tale tells of a famous shark of Ko‘olau called Hi‘u (the tail of a fish) (Sterling 1998:109 and Lueras 1983:92):

> According to this story, two families in the area used to exchange food, a common practice, the couple living seaside at Ke'anae giving fish and the couple living upland giving garden produce.
>
> One day the woman from the shore gave her sister-in-law on the hillside nothing but a fishtail in exchange for bananas and sweet potatoes. The woman took the fishtail home in her calabash, saying nothing about the scanty trade.
>
> That night both she and her husband dreamed of a shark, and when they woke up in the morning they found a live shark swimming around in the calabash, where only a tail had been the night before.
>
> The excited couple freed the shark in an upland pool and made offerings to it. During a heavy rain, the shark was washed down to the ocean, where…it lives to this day in an underground cave near Ke'anae wharf (Lueras 1983:92).

Studies of the history of land use indicate that lands within the Ko‘olau Moku were intensively and continuously used for wetland taro cultivation or *lo‘i* agriculture from the pre-Contact era up until the present day (Group 70 International, Inc. et al. 1995; Handy and Handy 1997). In addition to extensive *lo‘i* terracing and associated temporary habitation features, Land Commission Award testimony also indicates that the cultivation of the *olona* plant and gathering of *olona* fibers were also important parts of the traditional economy in the Ko‘olau area.

With regard to political influence and the course of Hawaiian history, it has been noted that there may have been some rivalry within Ko‘olau Moku between the *ahupua‘a* of Ke‘anae and neighboring Wailuanui. This rivalry, however, would give way to larger political battles concerning the rule of Maui Island and the line of succession between the sons of Pi‘ilani (Kamakau 1992:22-29), and later, the consolidation of power and unification of the Hawaiian Islands under Kamehameha (Group 70 International, Inc. et al. 1995).

Chief Pi‘ilani united all of Maui under his rule during the 16th or 17th century. Pi‘ilani’s sons Lonopi‘ilani and Kiha-a-Pi‘ilani fought for control of Maui. Kiha-a-Pi‘ilani eventually took refuge at Hāna. While in Hāna, Kiha-a-Pi‘ilani took as his wife Koleamoku, who had been betrothed to Lonopi‘ilani, which again put the two brothers to warring. Kiha-a-Pi‘ilani and his wife Koleamoku fled to Hawai‘i Island to enlist the aid of Umi. Umi was married to Pi‘ikea, the daughter of Pi‘ilani (sister of Lonopi‘ilani and Kiha-a-Pi‘ilani), a marriage that had formerly brought peace between the islands of Hawai‘i and Maui. However, Umi sided with Kiha-a-Pi‘ilani and sent an invasion fleet to Hāna. In Hāna, at Ka‘uiki, Lonopi‘ilani's forces, under the command of Ho‘olaemakua, withstood the Hawai‘i forces for a while until a nighttime raid overwhelmed them. With this battle Kiha-a-Pi‘ilani gained control of Maui. Kiha-a-Pi‘ilani "is credited with finishing the paved road around the island (Ke Alaloa o Maui), which his father (Pi‘ilani) had begun ... and restoring Honua‘ula *heiau* just inland of Pu‘u Ka‘uiki" (Griffin 1987:9).

During the last half of the 18th century the battles between Maui and Hawai‘i were carried on by the high chiefs Kahekili of Maui and Kalani-‘opu‘u of Hawai‘i. Kalani-‘opu‘u was in control of the Hāna and Kīpahulu areas from ca. 1759 to 1765 when Kahekili won out. However, the Hawai‘i forces were able to regain control from ca. 1775 to 1783. In 1778, when Capt. James Cook’s ships returned from their North American explorations, they stopped off Hāna but didn’t land. Kalani-‘opu‘u and Kamehameha both visited Cook’s ships, indicating who controlled the Hāna area. With the death of Kalani-‘opu‘u in 1782, Kahekili regained control of Hāna, which he retained, though not without further battles with Hawai‘i Island forces (i.e. Kamehameha), until his death in 1794. With the death of Kahekili and the assistance of newly acquired foreign power (canons, muskets, men) Kamehameha gained control not only of Maui, but of all the Hawaiian Islands, except Kaua‘i, by 1795.

Figure 5. Portion of the Dodge 1885 map showing the location of Kolea Reservoir in relation to traditional land divisions.

3.1.2 Early Historic Period

Following western contact and unification of the islands under a single ruler, and as a result of the shift from traditional Hawaiian land tenure to one based on western principles of private ownership through the execution of the Māhele, the influx of foreign interests and the introduction of rice as a cash crop began to change the cultural demographic of Ko‘olau Moku. The Hawaiian communities became more concentrated rather than dispersed throughout the region following the mid-19th century Māhele. When opportunities for land purchases through Royal Patent Grants arose, Hawaiians from the Ke‘anae area began to acquire these grants primarily for *kula,* or pasture lands, as either a single owner or as a *hui* or co-op (Linnekin 1983:185, 1985:24-25). There were twenty-one Royal Patent Grants issued in the Ke‘anae region (769.35 acres) alone, all but one going to Hawaiians (Linnekin 1985:24-25). The primary thrust, it seems, for the formation of the *hui* ventures and acquisition of these *kula* lands was to regain access to upland resources. A corollary effect of the formation of these land *hui* and the acquisition of *kula* lands was a greater retention of acreage by Hawaiians from Ke‘anae, thus effectively preventing foreign interests from developing sugar plantations or cattle ranches along the *mauka* portions of the region (Linnekin 1983;181-185).

In the second half of the 19th century, the market for rice grew markedly with an increasing demand from Chinese laborers working on the sugar plantations in Hāna. With a pond field irrigation system already in place in Ke‘anae, the region was ripe for conversion from taro cultivation to rice. It was common practice for Chinese entrepreneurs to lease former *lo‘i kalo* lands from Hawaiian owners for rice cultivation (Group 70 International, Inc et al. 1995:28). Tax records for 1890 indicate that the rice lands in Ke‘anae and Wailuanui comprised approximately 67.84 acres out of a total of 163.322 acres in pond-field agriculture. Two years later, this number rose to 75 acres in Ke‘anae and Wailuanui while other lands on Maui (Honokowai, Waikapu, Wailuku, Waiehu, and Waihe‘e) registered a combined acreage of 175 (Group 70 International, Inc. 1995:28 and Linnekin 1985:30). The Chinese farming community flourished in Ke‘anae and with an increase in population came improvements to infrastructure needed to support more people as well as to facilitate accessibility to this once remote region of Maui. These improvements included the opening of the historic Hāna Belt Road and construction of necessary buildings associated with the rice plantations. Rice farming however would decline sharply following 1910 and by 1935 it had ceased entirely (Group 70 International, Inc. et al. 1995:36-37).

3.1.3 Land Commission Awards in the Immediate Area

Following the Great Māhele of 1848, two *kuleana* Land Commission Award (LCA) claims were awarded in the general vicinity of the Kolea Reservoir (see Table 1, Figure 6). The LCA information suggests that, into the mid-19th century, the area surrounding the reservoir maintained a limited population with an economy focused on wetland agriculture. In addition there were also claims for *olona* and *kīhīpai*.

Table 1. Land Commission Awards near Kolea Reservoir (Waihona ‘Aina Corporation 2000).

LCA #	Claimant	Apana	‘Ili	Land Use
03715-B	Kekuahani	n=3	Keopuka, Loiloa	Lo‘i and Olona

LCA #	Claimant	Apana	‘Ili	Land Use
03957-B	Keuoho, Luka and Kenhoa	n=5	Punaluu	Agriculture

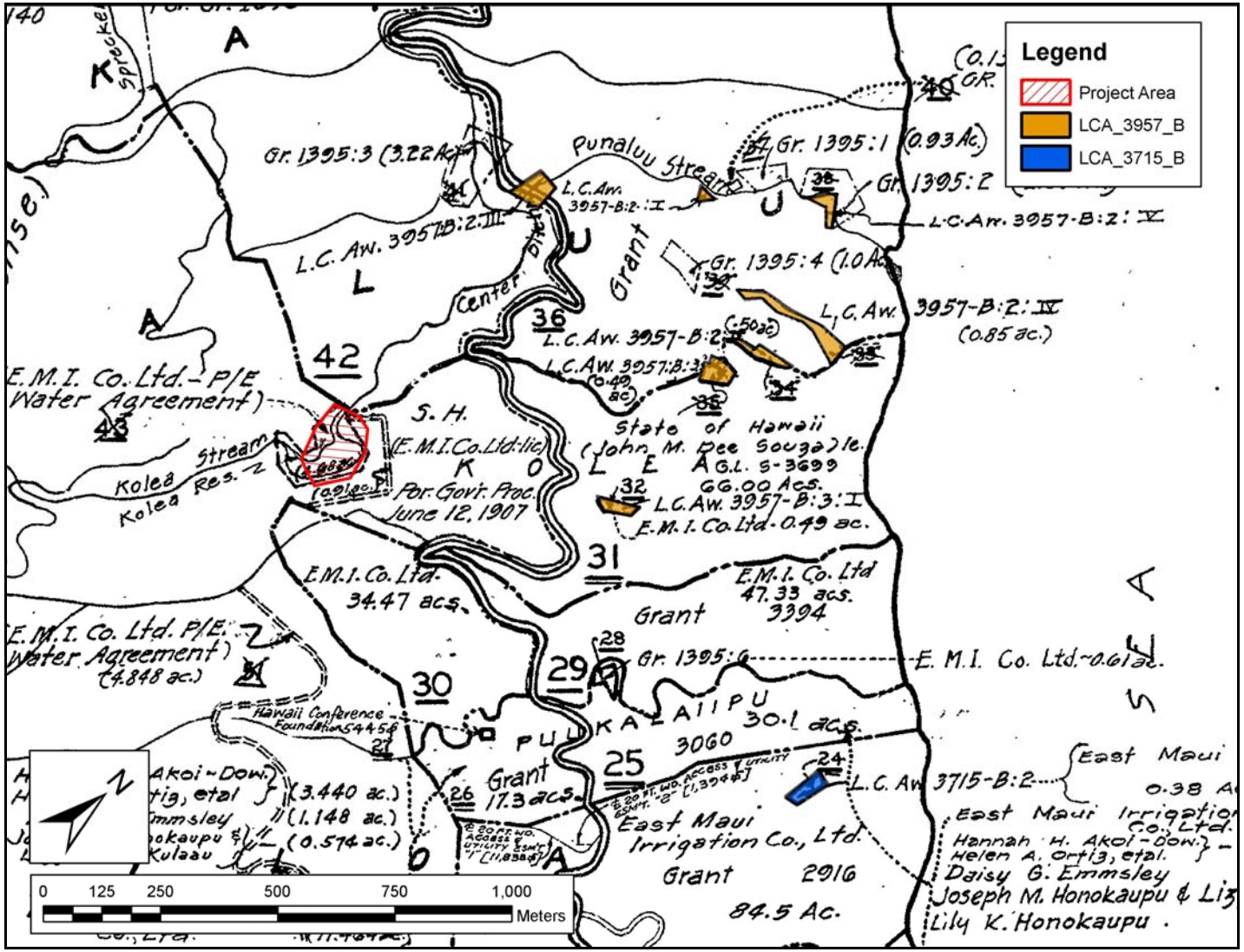


Figure 6 A portion of TMK (2) 1-1-001 showing LCA claims in Plat 001 in relation to the Kolea Reservoir.

3.1.4 1900s

Following the annexation of the Hawaiian Islands as a Territory of the United States in 1898, a county system of government was adopted. By 1905, Maui County had elected its first Board of Supervisors, hired its first road engineer, and established a system to appropriate money for road improvements (Maui News 1926). The “Belt Road” connecting Kahului with Hāna was given a high priority, with a general plan for its completion in place by 1910.

Prior to the construction of the Belt Road to Hāna, horse trails, developed when engineers constructed ditch systems between East Maui and the central Maui isthmus, were the only means of overland travel. Inter-island steamships made regular stops at the Ke‘anae Landing, but were considered expensive ($2.00 for deck passage). Travelers leaving Ha‘ikū on horseback for Ke‘anae descended and ascended 22 major valleys before arriving at Ke‘anae. Along the way, the traveler would have visited Native Hawaiian villages at Huelo, Kolia, Waiakamoi, Wahinepe‘e, Puahokamoa and Honomanū (Maui News 1926).

Writer George Bowser traveled to Ke‘anae on horseback in 1879, and described the village:

> My next halting place was the little hamlet of Keanae. There are here only few Kanaka huts and some patches of taro cultivation, but it is just the spot for the growth of the sugar cane, and has the benefit of a very good landing at which the steamer “Mokolii” calls about once a month. Mr. J.C. Garrett has a sugar plantation here, which was a delight to the eyes, as a contrast to the forest scenery I had been passing through. There are something like 2,000 acres here, all virgin land, capable of being turned account for the cultivation of the sugar cane.
>
> The native huts are generally constructed of a framework of bamboo, with something more substantial for uprights with rafters of bamboo for the roof. Over these a covering is laid of the native grass called pili, which will last for twenty years and will withstand the heaviest rains. Some huts, however, are covered with lauhala, which is the leaf of the puhala tree. The natives sometimes cook inside their huts. The sleeping place is on a raised platform about a foot and a half from the floor, and is covered with two or three layers of matting, also made of lauhala. I found these matting beds very comfortable to sleep upon and very suitable to the climate.
>
> Wailua is the name of the next place I arrived at, some two miles further on. Near the road from Keanae to here are several beautiful waterfalls. These, in the summertime, are beautified by perpetual rainbows. The Wailua Valley is about two miles square. There are here a church and a school house and a number of native houses, some of which are built of wood. For shooting, there is an abundance of wild turkeys and wild goats; plenty of fish of various sorts are always close at hand, oranges and wild bananas, mountain apples and guavas, all to be had for the picking.
>
> There is, in this part of the island, a species of taro which does not require irrigation. It is planted in rows the same way we plant potatoes, and it comes to

> maturity within the same time as the other species which needs to constantly be covered with water viz.: in about twelve months from the time of planting (Maui News 1926:Section Seven).

By 1922, the Belt Road had been completed between Kuiaha and Kakipi Gulch. In 1923, the County Board of Supervisors requested more prison labor for roadwork between Kailua and Ke‘anae. While road work continued toward Ke‘anae, survey work commenced between Ke‘anae and Kopili‘ula. In June 1925, the grand opening of the Kailua-to-Ke‘anae portion of the Belt Road was celebrated by a procession of automobiles to Ke‘anae. Territorial Governor Wallace Farrington dedicated the opening of the road with County Board of Supervisors Chairman Samuel Kalama and others (Figure 7) (Maui News 1926).

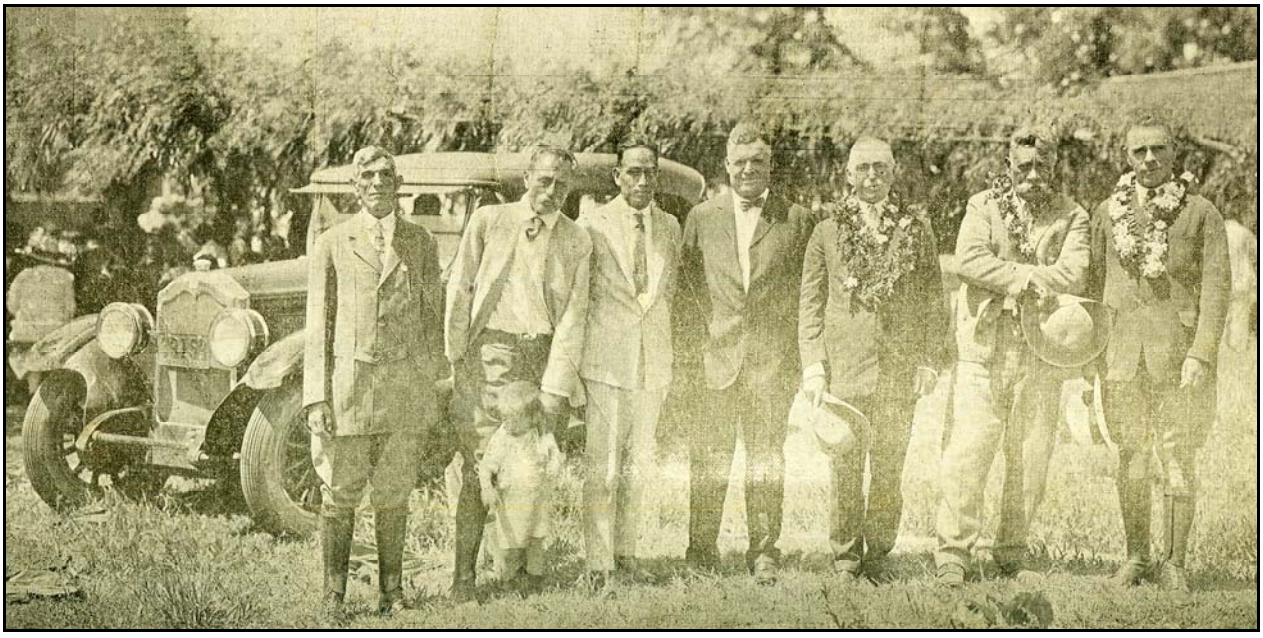


Figure 7. A group of Maui County Supervisors pose with Governor Farrington in Ke‘anae. Left to right: R.A. Drummond, W.F. Kaae, County Engineer P. Low, Sheriff C. Crowell, Governor W. Farrington, Chairman S. Kalama and D.T. Fleming.

On April 1, 1946 a *tsunami* generated by an earthquake in the Aleutian Islands off the coast of Alaska, struck the Ke‘anae Peninsula. The height of the *tsunami* run-up over two separate spots at Wailua was measured at 4.8 meters (15.7 ft.) and at 5.1 meters (16.7 ft.) (World Data Center 1977). The Lanakila Ihiihi O Iehowa Ona Kaua Congregational Church, constructed of coral and stone on the Ke‘anae Peninsula between 1857 and 1863, was the only structure left standing when the *tsunami* receded (Bartholomew and Bailey 1994). Today, Ke‘anae and Wailua are a fretwork of working taro fields, small residential areas, and parks. Residents live on higher ground in Wailua, and send their children to school in Hāna, some 14 miles away.

3.2 Previous Archaeological Research

This section provides a brief overview of the research and findings of previous archaeological investigations in the general area of the current project (Figure 8 and Figure 9). Investigations including the current project area are discussed next followed by a summary of those conducted nearby (Table 2).

While there is a relatively high density of historic properties recorded within Ko‘olau Moku (Figure 9 and Table 3), few archaeological investigations have been conducted in this area. Formal archaeological research began on Maui early in the twentieth century when Thomas Thrum began recording the *heiau* of Maui in the Hawaiian Annual from 1909 through 1918. By the conclusion of his study, Thrum had located 121 *heiau* on Maui (Thrum 1909-1918). At the same time, J.F.G. Stokes documented many structures and heiau in Maui (Stokes 1918). However, the first attempt at a systematic island –wide survey was undertaken by Winslow Metcalf Walker from 1928 to 1929. The survey was commissioned by the Bishop Museum and focused on large sites and *heiau* around the island.

Table 2. Previous archaeological studies in the general vicinity of Ko‘lea dam.

Author(s)/ Date	Location	Nature of Work	Findings
Stokes 1918	Island-wide	Search for heiau structures	Identified seven heiau in Ko‘olau Moku.
Walker 1931	Island-wide	Island-wide archaeological survey with a primary focus on monumental and/or ceremonial archaeology	Identified 20 heiau in Ko‘olau Moku, noted ten destroyed.
Palama 1981	Wailua Homestead	Archaeological field inspection	No findings
Group 70 et al. 1995	Keanae/Wailuanui	Archaeological inventory survey in conjunction with a cultural landscape study of the Wailua Nui and Ke‘anae irrigated taro complex	Identified three distinct taro field systems and defined the overlying cultural landscape of the region.
Haun and Henry 2003	Wailuanui Ahupua‘a	Archaeological inventory survey	Pre-contact temporary habitation site and trail

Stephen Palama (1981) conducted an archaeological field inspection of approximately 3.16 acres within Wailua Homesteads. This cursory field inspection did not locate any new historic properties.

Kukui o Puni Heiau (SIHP 50-50-07-096) was further described during a more recent archaeological cultural landscape investigation of three separate taro field systems found at Wailuanui and Ke‘anae (Group 70 International, Inc. et al. 1995).

Haun and Henry (2003) conducted an archaeological inventory survey of approximately 4 acres at Pauwalu in Wailuanui Ahupua‘a. The inventory survey resulted in the identification of one historic property, SIHP 50-50-07-5237, consisting of an overhang (Feature A) and trail (Feature B). The overhang was interpreted as a pre-contact temporary habitation shelter that was occupied between AD 1420-1650 and the trail as a transportation route.

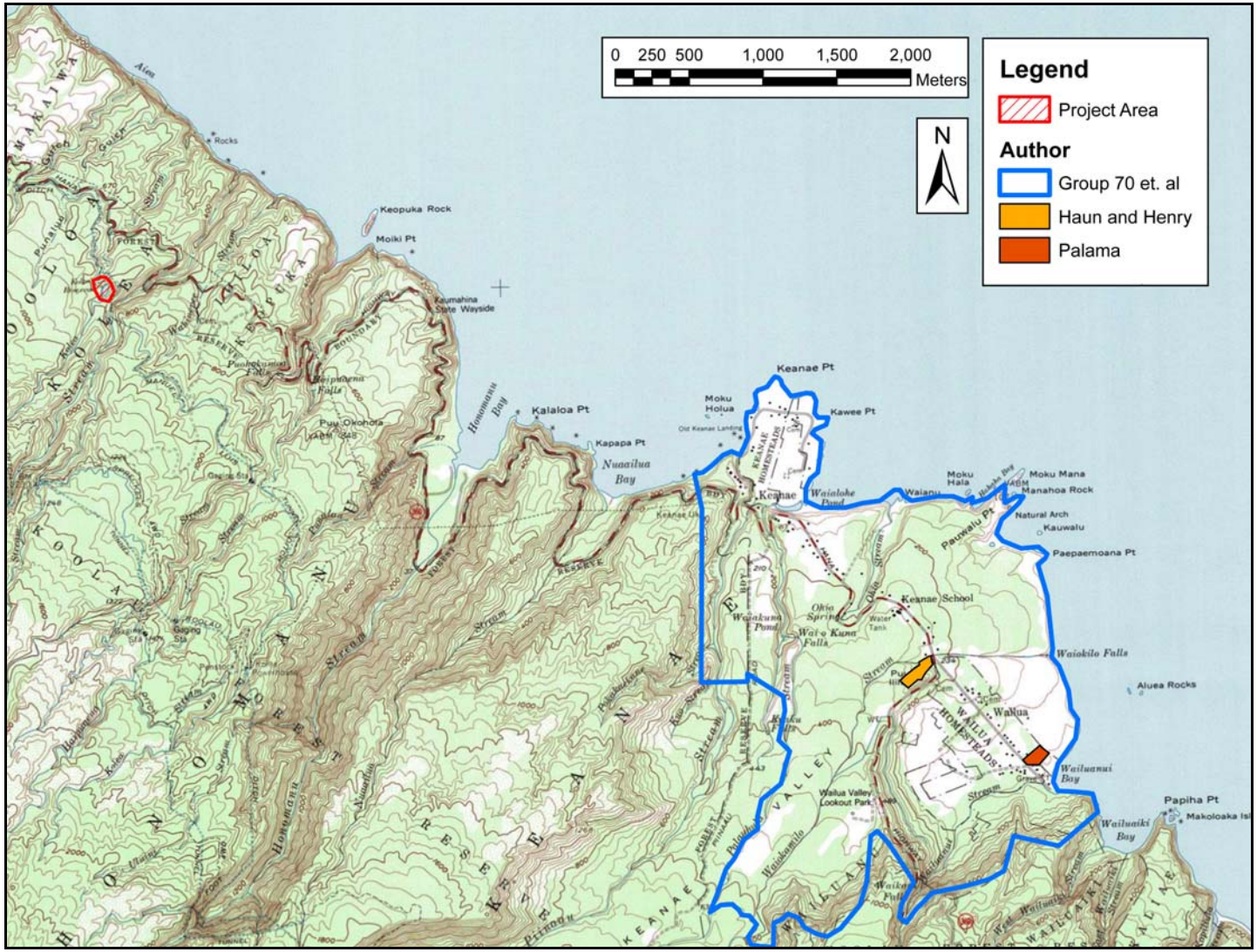


Figure 8. A portion of the 1983 Keanae 7.5-minute USGS topographic quadrangle showing previous archaeological studies in the vicinity of Kolea Reservoir

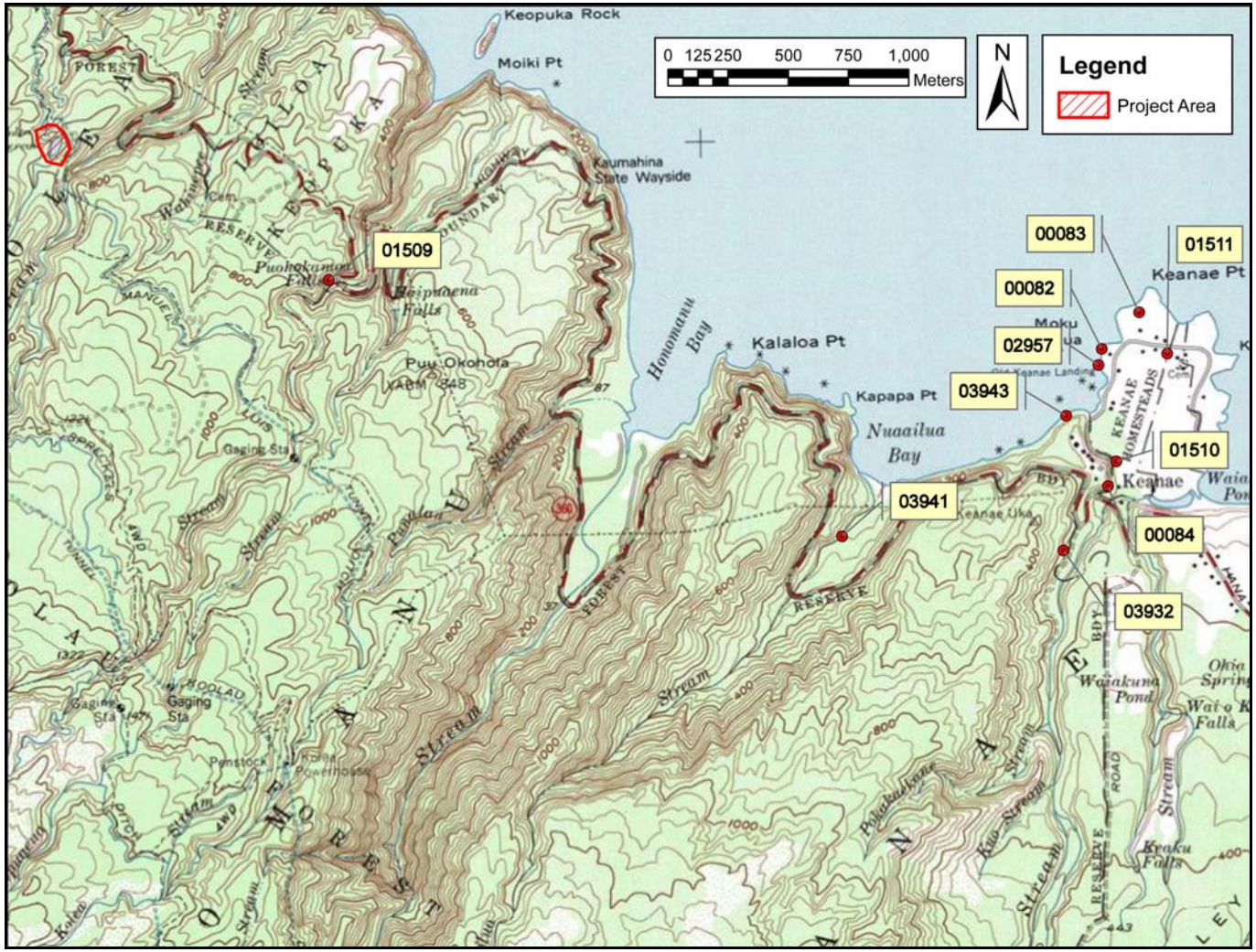


Figure 9. A portion of the 1983 Keanae 7.5-minute USGS topographic quadrangle showing the locations (Department of Land and Natural Resources, State Historic Preservation Division [DLNR/SHPD] 2004) of previously documented historic properties in relation to the Kolea Reservoir.

Table 3. Brief descriptions (DLNR/SHPD 2004; Haun and Henry 2003) of previously documented historic properties in relation to the Kolea Reservoir

SIHP# 50-50-07-	Name	Ahupua‘a	Comments
00082	Kukuiolono Heiau	Ke‘anae	Destroyed
00083	Laloa Heiau	Ke‘anae	Destroyed
00084	Pakanaloa Heiau	Ke‘anae	Reported as a war heiau to Kanehikili; Destroyed
01509	Puohokamoa Bridge	Honomanu	Constructed in 1912, placed on Hawaii Register of Historic Places in 1974.
01510	Lin Hing Society Building	Ke‘anae	Placed on Hawaii Register in 1974; disassembled
01511	Lanakila Church	Ke‘anae	Established 1856
02957	Ke‘anae Landing	Ke‘anae	Historic boat/steamship landing
03932	Ke‘anae Arboretum Taro Complex	Ke‘anae	Comprised of 14 lo‘i and a main ‘auwai
03941	Nua`ailua Taro Complex	Ke‘anae	Site -03941 appeared to be an old, unmodified complex of lo`i sitting above and below Hana Highway. No size estimate given by CSH (1994 survey).
03943	Ke‘anae Quarry	Ke‘anae	Consists of historic quarry with rock crusher still in place. A stone platform within the quarry boundaries is said to be the grave of a worker killed in a quarry accident.

3.3 Background Summary and Predictive Model

The initial occupation of this portion of Maui first occurred along the coastal region of Hāna about AD 1200 (Haun et al. 2004). The accepted pre-contact settlement pattern for the region of Ke‘anae/Wailuanui centers on the series of occupational episodes that utilized the Palauhulu Stream for taro (*Colocasia esculenta*) cultivation. A 1995 cultural landscape study by Group 70 International, Inc., Davianna McGregor, and Cultural Surveys Hawai‘i Inc. recorded the intensive use of the Ke‘anae and Wailuanui region for taro, identified three separate field systems, and noted the processes by which community cooperation led to the field system operation.

Evidence of a cohesive population is perhaps best described by the first Europeans to visit Ke‘anae. From the journal of William Richards (1829), a Protestant missionary, comes information that the region between Honomanu and Wailua was densely populated:

> We went on board the canoe, and rowed a few miles, avoiding some difficult *paries* [steep cliffs]. After landing, we walked a few miles further, to Wailua, where we

> put up for the Sabbath. Very early the morning [of the Sabbath], the horns, summoning the people to the house of God, were heard in every direction; and we soon perceived that the call had not been heard with indifference. At the early hour, the house was thronged with attentive worshippers. [The next day] we examined the schools, which were large. About 10 o'clock, A.M., the princess [Nahienaena] arrived, and addressed the people; after which, we proceeded on our way [to Hāna] (Richards 1829:249).

According to the Group 70 International, Inc. et al. (1995) cultural landscape study, over 490 LCAs claimed taro patches of various sizes at Ke‘anae and Wailuanui during the mid-19th century Great Māhele. Several LCAs included claims for pools and fishponds. In addition, evidence of densely-grouped regional *heiau* and smaller shrines was the subject of specialized studies dating from the turn of the 20th century (Thrum 1907) to more recent work by Maria E. Orr (1990).

Background research into the land use patterns of the surrounding vicinity indicated that the area was intensively used for pre-contact agricultural pursuits, permanent and temporary habitation and traditional ceremony, as well as historic-era agriculture represented by both taro and rice cultivation. As such, it was deemed possible that historically significant subsurface cultural deposits in the form of pond-field deposits representing both traditional and historic agriculture, as well as, midden and other cultural material concentrations representing both traditional and historic habitation may occur within the area.

Section 4 Results of Fieldwork

During the current investigation one historic property was recorded, SIHP # 50-50-13-6682, the Kolea Reservoir. According to the Department of Land and Natural Resources (DLNR) Dam Safety Program, the Reservoir, State Dam ID MA-0097, National ID HI00097, was constructed in 1901 (Figure 10). Six associated features were observed during the inventory survey, five within the project area and one just outside. A detailed description of the historic property is presented in this following section.

4.1 Historic Property Description

SITE NUMBER SIHP # 50-50-13-6682

FUNCTION: Water Control

SITE TYPE: Plantation Reservoir

TOTAL FEATURES: 6

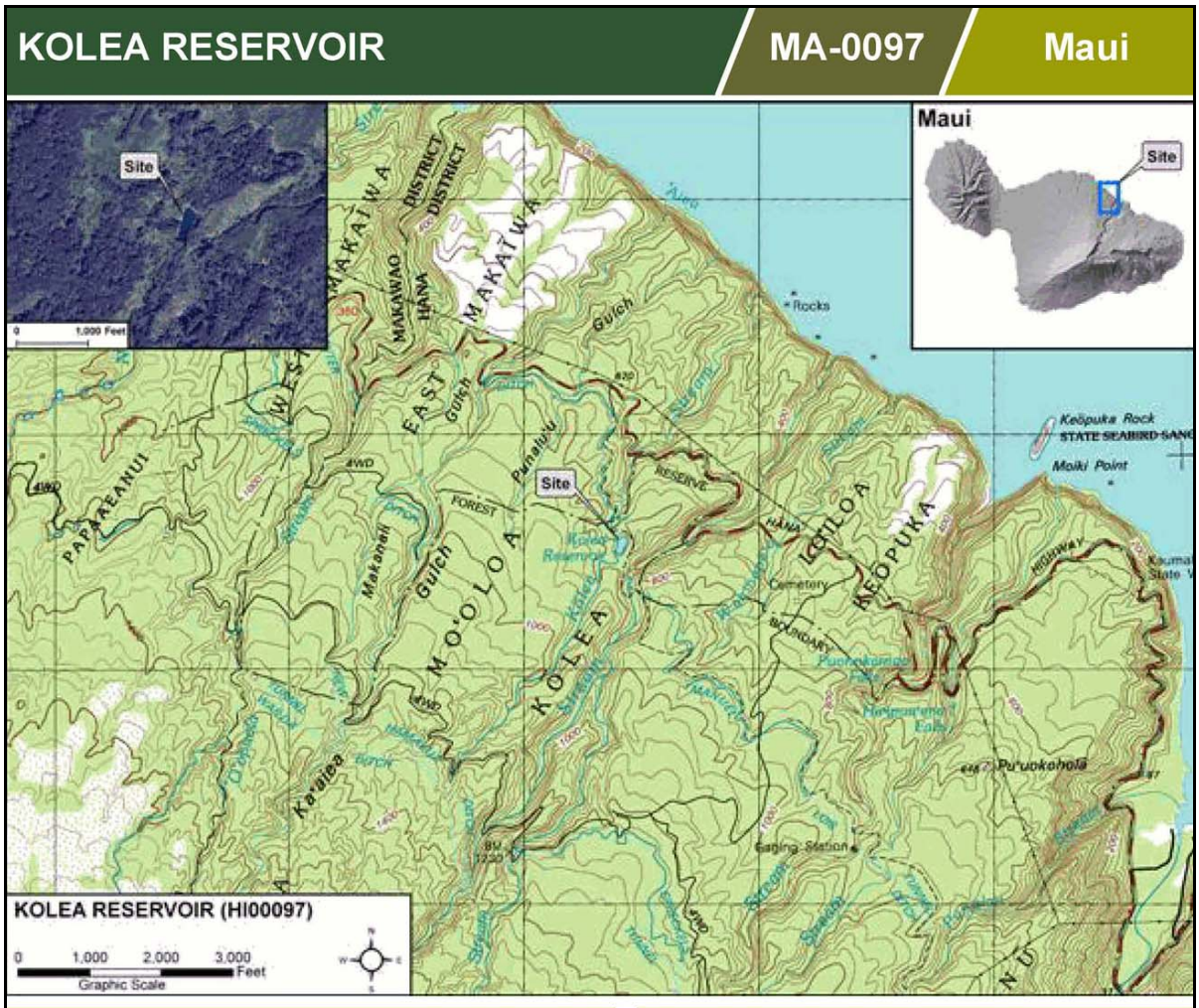
DIMENSIONS: 120m N/S 120m E/W

CONDITION: Good

AGE: Plantation era

DESCRIPTION: SIHP # 50-50-13-6682 (Figure 11) is a plantation-era reservoir/water control system constructed in 1901 consisting of six associated features, five within the project area, and one just outside (Figure 12 and Figure 13). These features include: the spillway (Feature A), reservoir (Feature B), a catwalk (Feature C), the dam (Feature D), and the reservoir outlet (Feature E) within the project area. Feature F, a water diversion structure, is located immediately north of the project area.

There are no known construction or design plans for the reservoir (Mark K. Vaught, Operations Manager, East Maui Irrigation Co, Ltd., Personal Communication 2010). However, Stephen Cabral, a former EMI Manager, was able to provide some insight into the construction of the reservoir. Mr. Cabral notes that all of the stone work at the face of the dam, obscured today by bamboo, was delivered to the site by mule and ox and dumped in place from the stream level up. All cutting was by hand and explosives (Stephen Cabral Personal Communication March 08, 2010).



1. General Information	
a. State Dam ID	MA-0097
b. National ID	HI00097
c. Dam Name	KOLEA RESERVOIR
d. Other Name(s)	
e. Longitude / Latitude	-156.1898 / 20.8724
f. County / Island	Maui / Maui
g. Type of Dam	Earthen
h. Purpose	Irrigation
i. Completed / Last Modified	1901 /
j. Nearest City / Town	
k. Water Body Type	State Regulated Dam
l. Dam Height	45 ft
m. Dam Length	300 ft
n. Drainage Area	/
q. Primary Spillway Type	Channel
r. Maximum Storage	34 ac-ft / 11 MG

2. Owner Information	
a. Name of Owner	East Maui Irrigation Company; State of Hawaii, Dept of Land & Natural Resources
b. TMK(s):	(2) 1-1-001: 050

3. Hazard Potential Classification	
a. Hazard Rating1	Proposed Low
b. Date of Assessment	

4. Other Information	
a. Last Inspection	03/07/2008
b. Emergency Action Plan Date	03/22/2006

Figure 10. Dam Information Sheet provided by the Department of Land and Natural Resources-Engineering Division (DLNR 2009)

Figure 11. A portion of the USGS 7.5’ topographic map, Keanae Quadrangle (1983) showing the site boundary in relation to the project area.

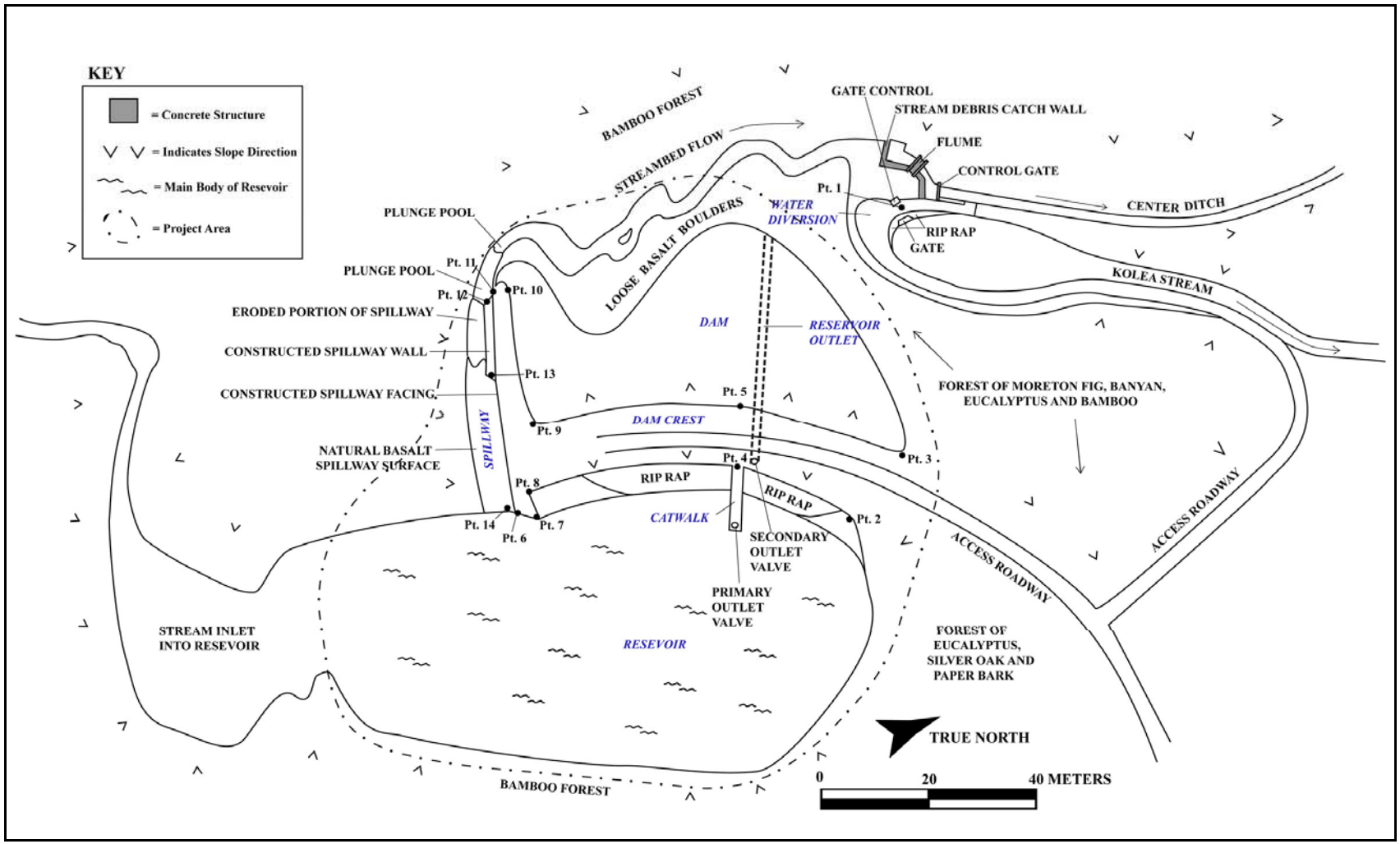


Figure 12. Field drawing of site CSH 1, features shown in blue.

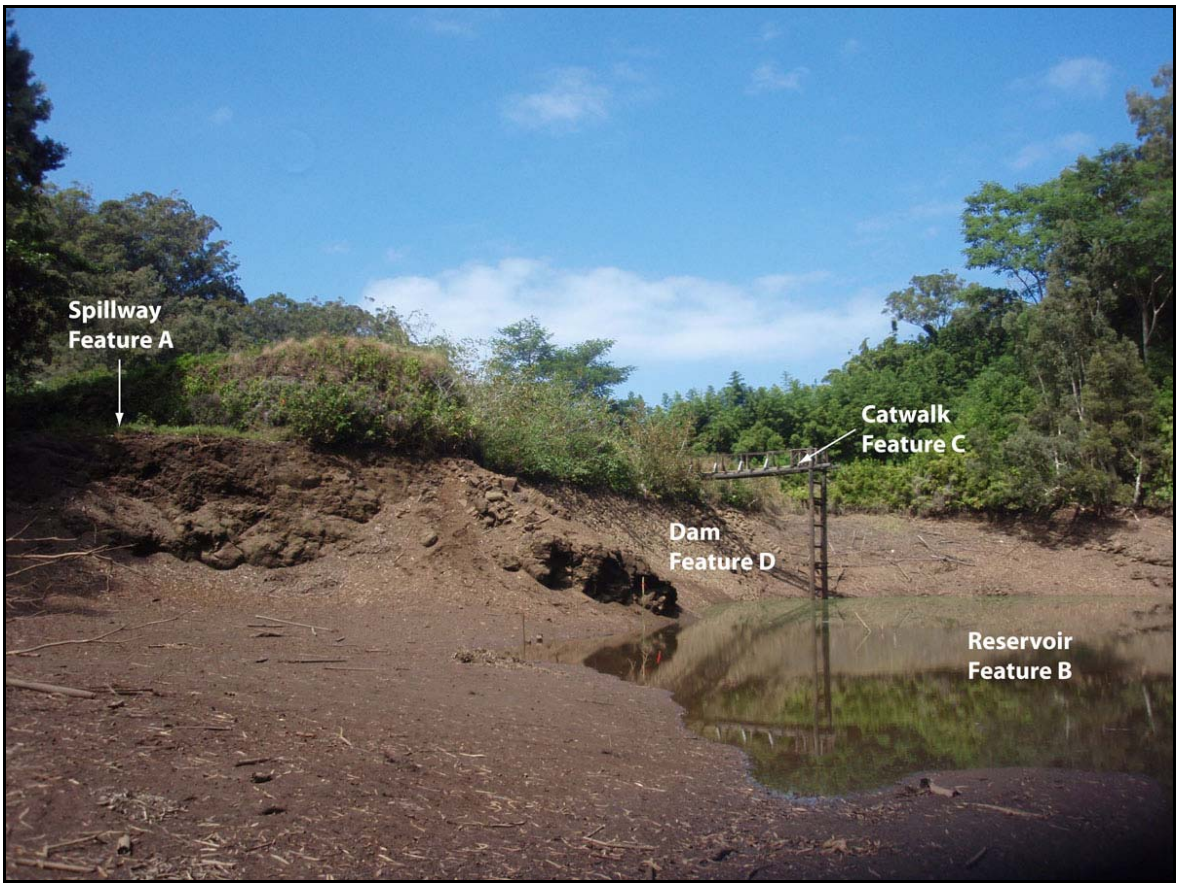


Figure 13.A view of the reservoir showing associated features within the project area, Feature E is underwater and not visible.

Feature A, the spillway, is located upstream of the Kolea Dam and west of the reservoir. It was designed to allow excess storm runoff to bypass the resevoir. The spillway is essentially a notch cut against a mountainside resulting in a 16m tall wall to the south, and a 3 m tall constructed stacked basalt boulder wall along its north face. The spillway is 10m wide and 4m above the floor of the reservoir ending in two deep natural plunge pools, each 4m deep. Water diverted by the spillway is returned to the natural streambed via the two plunge pools. The entire floor of feature A is exposed bedrock.

Figure 14. Feature A, spillway, view to west.

Feature B, the Kolea Stream reservoir was dredged and constructed in 1901. By the use of a dam constructed of the dredged earth and large basalt boulders, the reservoir holds stream water. A control allows the stored water to be released at a regulated rate. All sides of the reservoir are earthen.

Feature C is a wood frame catwalk which begins at the crest of the Kolea Dam. It is built straight out into the reservoir on a pair of wood poles over 15m tall (Figure 15). Another pair of poles over 10m long connect the structure to the bank of the crest of the dam. A row of 14 wood 4 x 4 beams provides a base for metal panels that span the entire length of the catwalk. A railing that runs the length of the catwalk is of wood and is supported by 8 2x 4 beams on each side (16 in all). At the end of the catwalk, some 60 feet above the Kolea Reservoir, is a control wheel for the reservoir. At scale built onto one of the support poles measures the level of the reservoir to a maximum depth of 43 feet. The reservoir catwalk was an improvement constructed sometime in the 1970’s; prior to that, the reservoir control was built into the side of the reservoir dam crest (Stephen Cabral Personal Communication March 08, 2010).

Figure 15 Feature B, the catwalk, and Feature C, the reservoir, view to south.

The Kolea Dam was constructed to store stream water from the Kolea Stream in a reservoir located southeast of and behind the crest of the dam. The date of construction is between 1900 and 1901, according to DLNR records. While constructing the dam, earth was packed behind the dam face. Rock from blasting at the spillway was utilized to construct the rock face cut just south of the spillway. All rip-rap surfaces at the reservoir and at the lower water diversion ditch were hand-built (Stephen Cabral Personal, Communication March 08, 2010). The Crest of the dam measures 70m long of the 100m and is 10m wide.

Figure 16. Feature D, the dam view to south.

Feature E, the Kolea Dam reservoir outlet is a controlled gate built into the reservoir that allows the reservoir water to exit and travel to the center ditch diversion control (Feature F). The reservoir outlet consists of a primary control wheel on the catwalk and a secondary control wheel on the crest of the dam which operate a gate releasing stored water at a controlled rate. The gate is supported on the interior of the reservoir by a rip-rap wall of set basalt boulders that appear faced, but in fact are not.

Figure 17. The secondary outlet valve control for Feature E, view to the north.

Feature F, the concrete stream diversion controls, are located to the northwest and downstream of the Kolea Dam, just outside of the project area. The diversion controls consist of a poured concrete wall which separates stream debris from the water, a basalt boulder dam which diverts stream overflow into the streambed of Kolea Stream (if required), a flume which delivers additional off-site stream water to the diversion control, in addition to a concrete control gate and concrete-lined canal which constitutes the beginning of the "center ditch". According to Mr Cabral, concrete improvements at the Center Ditch diversion continued through the 1970’s, but he had not heard about any concrete work done there since (Stephen Cabral Personal, Communication March 08, 2010). A dirt access road ends atop the basalt boulder dam. A control wheel allows the overflow to travel through a gate to the Kolea stream.

Figure 18. Feature F, the water diversion controls, view north.

Section 5 Summary and Interpretation

One historic property was recorded, SIHP # 50-50-03-6683, the Kolea Reservoir. According to the Department of Land and Natural Resources (DLNR) Dam Safety Program, the Reservoir, State Dam ID MA-0097, National ID HI00097, was constructed in 1901. Six associated features were observed during the inventory survey, five within the project area and one just outside. These include the spillway (Feature A), reservoir (Feature B), a catwalk (Feature C), the dam (Feature D), and the reservoir outlet (Feature E) within the project area. Feature F, a water diversion structure is located immediately north of the project area

The fieldwork component of the archaeological inventory survey was accomplished on February 23 and 24, 2010 by CSH archaeologists, Todd McCurdy, M.A. and Robert Hill, B.A., under the general supervision of Hallett H. Hammatt, Ph.D. The fieldwork required approximately 20 person-hours to complete. The inventory survey documentation included site recordation of the Kolea Reservoir and associated features.

For well over 100 years the Kolea Reservoir has been a reminder of the water intensive agriculture and associated development on the "Valley Isle" during the plantation period. Of the 54 reservoirs recorded in Maui, there are only two others that pre-date the Kolea Reservoir, Kaupakalua and Kapalaalaea Reservoirs, both constructed in 1885 (Department of Natural Resources-Engineering Division 2009). The crude style and hand-built construction of the Kolea Reservoir represent the ingenuity the plantation-era engineers and the determination of the workers who built it. The more dependable water supply from the reservoir increased production of the fields and increased the amount of arable land which necessitated additional labor, thus affecting the broad economic and social patterns of the island.

Section 6 Significance Assessments

Significance assessments have been made in accordance with the State Department of Land and Natural Resources (DLNR) Chapter 13-284, Hawai‘i Administrative Rules (HAR), entitled “Rules Governing Procedures for Historic Preservation Review to Comment on Section 6E-42, Hawai‘i Revised Statutes (HRS), Projects”. Chapter 13-284-6, entitled “Evaluation of Significance”, states:

a. Once a historic property is identified, then an assessment of significance shall occur. The agency shall make this initial assessment, or delegate this assessment, in writing, to the SHPD. This information shall be submitted concurrently with the survey report, if historic properties are found in the survey.

b. To be significant, a historic property shall possess integrity of location, design, setting, materials, workmanship, feeling, and association and shall meet one or more of the following criteria:

   A. *Sites that are associated with events that have made a significant contribution to broad patterns of our history; or*

   B. *Sites that are associated with the lives of persons significant in our past; or*

   C. *Sites that embody the distinctive characteristics of a type, period, or method of construction, or that represents the work of a master, or that possesses high artistic values, or that represents a significant or distinguishable entity, whose components may lack individual distinction; or*

   D. *Sites which have yielded, or may be likely to yield, information important in prehistory or history; or*

   E. *Sites which have an important value to the native Hawaiian people or to another ethnic group of the State due to associations with cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events, or oral accounts- these associations being important to the groups’ history and cultural identity.*

6.1 SIHP 50-50-13-6683

Table 4. Summary of Significance Assessments.

SIHP 50-50-13-	Site Type	Function	Age	Significance Criteria	Recommendations
6683	Plantation Reservoir	Water Diversion	Plantation era	A,C,D	A minimum of Architectural Inventory Survey Report Documentation

6.1.1 Criterion of Significance A

SIHP 50-50-13-6683, the Kolea Reservoir, is identified as significant under Criterion A as being associated with events that have made a significant contribution to broad patterns of our history. The reservoir is associated with a period of major change on Maui. Built in 1901, it was the first reservoir constructed on Maui after the annexation of Hawai‘i by the United States in 1898 according to the DLNR-Engineering Division (2009). The relaxation of tariffs and escalating demand for sugar thereafter made it a more profitable industry. Of the 54 existing reservoirs, 29 were built by 1918 and only two were constructed prior to the annexation, both in 1885 (DLNR-Engineering Division 2009). The increased water supply from the reservoirs improved the crop yield and more importantly increased the amount of arable land, therefore leading to additional labor requirements. This in turn encouraged an influx of immigrant contract laborers thus affecting the broad economic and social patterns of the island.

6.1.2 Criterion of Significance C

The method of construction utilized at SIHP-6683 displays a distinctive style consistent with the early plantation period on Maui. Its crude style and hand-built construction represent the ingenuity of the plantation-era engineers and the determination of the workers who built it. In addition it serves as a good example of early water diversion methods associated with the sugar industry. For these reasons SIHP-6683 is considered significant under Criterion C as it embodies the distinct characteristics of a method of construction.

6.1.3 Criterion of Significance D

This portion of plantation infrastructure has yielded information important to the understanding of water diversion techniques and structures employed during the early plantation period on Maui. For this reason, SIHP -6683 is considered significant under Criterion D.

Section 7 Project Effect and Mitigation Recommendations

Since there are no known construction or design plans for this reservoir (Mark K. Vaught Operations Manager, East Maui Irrigation Co, Ltd. Personal Communication 2010) and based on the above significance evaluations of SIHP 50-50-13-6683, Cultural Surveys Hawai‘i recommends a minimum of an Architectural Inventory Survey of this historic property the level of recordation to be determined in consultation with SHPD Historic Architecture Branch.

7.1 Disposition of Materials

All of the data gathered and generated during the course of documenting SIHP 50-50-13-6683 are currently being curated and housed at the Maui Office of Cultural Surveys Hawai‘i, Inc. (1993 Main Street, Wailuku, HI 96793), with copies on file at the main office of Cultural Surveys Hawai‘i, Inc. (41-1537 Kalanianaole Hwy # 200, Waimanalo, HI 96795-1185).

Section 8 References Cited

Bartholomew, Gail and Bren Bailey
1994 *Maui Remembers, A Local History*, Mutual Publishing, Honolulu

Beckwith, Martha
1970 *Hawaiian Mythology*. University of Hawaii Press, Honolulu,HI.

Department of Land and Natural Resources-Engineering Division
2009 Department of Land and Natural Resources Electric document, http://www.hidlnr.org/eng/dam/Maui.aspx, accessed March 4, 2010.

Department of Land and Natural Resources, State Historic Preservation Division
2004 *Geographic Information System (GIS) Archaeological Site Data for Maui (Version 2004.02)*. Electronic Database and GIS coverages. Universal Transverse Mercator (UTM) Projection, Zone 4, Old Hawaiian Datum (Clarke 1886 Ellipsoid). DLNR/SHPD, Honolulu.

Dodge, F.S.
1885 Maui, Hawaiian islands/primary triangulation by W.D. Alexander and S.E. Bishop; topography and boundaries by W.D. Alexander, C.J. Lyons, M.D. Monsarratt [map]. Scale = 1:90,000. Hawaiian Government Survey. On file at the Library of Congress Geography and Map Division, Washington D.C. Digital ID g4382m ha000012 http://hdl.loc.gov/loc.gmd/g4382.ha000012 (last accessed October 2007).

Fornander, Abraham
1999 [1916-16] *Hawaiian Antiquities and Folklore*. Vols. IV and V. Bishop Museum Press, Honolulu.

Foote, Donald E., E.L. Hill, S. Nakamura, and F. Stephens
1972 Soil Survey of the Islands of Kaua‘i, Oahu, Maui, Molokai and Lanai, State of Hawaii, U.S. Dept. of Agriculture. U.S. Government Printing Office, Washington, D.C.

Giambelluca, Thomas W., Michael A. Nullet, and Thomas A. Schroeder
1986 *Rainfall Atlas of Hawai‘i*. Department of Land and Natural Resources, Honolulu.

Griffin, Agnes
1987 *Report on a Field Inspection of Hāna Ranch Inc. Construction Site, Wananalua, Hāna, Island of Maui*, DLNR, HI.

Group 70 International, Inc., Davianna McGregor, and Cultural Surveys Hawai‘i Inc.
1995 *Kalo Kanu O Ka‘āina*: *A Cultural Landscape Study of Ke‘anae and Wailuanui, Island of Maui*. Prepared for The County of Maui Planning Department and The Maui County Cultural Resources Commission.

Handy, E.S. Craighill and Elizabeth Handy
1997 *Native Planters in Old Hawaii*, B.P. Bishop Museum Press, Honolulu.

Haun, Alan E. and Dave Henry
2003 Archaeological Inventory Survey TMK: 1-1-008:015, 023, Land of Pauwalu, Hana District, Island of Maui. Haun & Associates. Keaau, HI.

Haun, Alan, Dave Henry, and Maria E. Orr
2004 Archaeological Inventory Survey Wai‘ānapanapa State Park, Lands of Honokalani, Wākiu, and Kawaipapa, Hāna District, Island of Maui, Haun and Associates, Kea‘au HI.

Kamakau, Samuel M.
1992 *Ruling Chiefs of Hawaii*, the Kamehameha School Press, Honolulu.

Linnekin, Jocelyn
1983 The *Hui* Lands of Keanae: Hawaiian Land Tenure and the Great Mahele. *Journal of the Polynesian Society* 92:169-188.

1985 *Children of the Land.* Rutgers University Press. New Brunswick, NJ.

Lueras, Leonard
1983 *On the Hana Coast*. Honolulu: Emphasis International Ltd.

Maui News
1926 Industrial Edition, Saturday, December 4, 1926, Maui Publishing Company, Wailuku, Maui, HI.

Orr, Maria E.
1990 A Preliminary Report on the Heiau of Hana and their Significance, Past and Present, Department of Anthropology, University of Hawai‘i, Honolulu.

Palama, Stephen
1981 Archaeological Field Inspection, Wailua, Hana, Maui. Makawao, HI.

Pratt, Linda W. and Samuel M. Gon III
1998 Terrestrial Ecosystems, section, appearing in *Atlas of Hawai‘i*, edited by Sonia p. and James O. Juvik, University of Hawai‘i Press, Honolulu.

Pukui, Mary K., Samuel H. Elbert and Esther Mookini
1974 *Place Names of Hawaii*, University of Hawai‘i Press, Honolulu, HI.

Richards, Reverend William
1829 Journal of William Richards, as printed in *The Missionary Herald*, For the Year 1829, Volume 25, American Board of Commissioners for Foreign Missions, Crocker & Brewster, Boston.

Sterling, Elspeth P.
1998 *Sites of Maui*, Bishop Museum Press, Honolulu, HI.

Stokes, J. F. G.
1918 Field notes, MS SC Group 2 Box 3; *Report on the Heiau of Maui*, 1918, MS SC Stokes Group 3, Box I; *Maui Sites Notes*, Anthropology Department Records, Group 7 Box 10. Bishop Museum Archives, Honolulu, HI.

Thrum, Thomas
1907 Heiaus and Heiau Sites Throughout the Hawaiian Islands, *Thrum's Hawaiian Almanac and Annual* (also issues for the years 1909, 1917 and 1921), Honolulu.

U.S. Department of Agriculture, Natural Resources Conservation Service

2001 *Soil Survey Geographic (SSURGO) database for Island of Maui, Hawaii (hi980).* U.S. Department of Agriculture, Natural Resources Conservation Service. Fort Worth, Texas. <http://www.ncgc.nrcs.usda.gov/products/datasets/ssurgo/> (last accessed October 2007).

Waihona ‘Aina

2000 Mahele Database. Online database, http://www.waihona.com/, last accessed August 2006.

Walker, Winslow

1931 Archaeology of Maui, Manuscript, Anthropology Department, Bernice Pauahi Bishop Museum, Honolulu.

World Data Center for Solid Earth Geophysics

1977 *Catalog of Tsunamis in Hawaii*, National Academy of Sciences, 2101 Constitution Avenue N.W., Washington, D.C.

Appendix A Land Commission Awards (Waihona ‘Aina Corporation 2000)

A.1 03715B Kekuahani

Claim Number:	**03715B**		
Claimant:	**Kekuahani**		
Other claimant:			
Other name:			
Island:	**Maui**		
District:	**Koolau**		
Ahupuaa:	**Haiku**		
Ili:	**Keopuka, Loiloa**		
Apana:	**3**	Awarded:	**1**
Loi:		FR:	
Plus:		NR:	
Mala Taro:		FT:	**39v15**
Kula:		NT:	
House lot:		RP:	**7518**
Kihapai/Pakanu:		Number of Royal Patents:	**1**
Salt lands:		Koele/Poalima:	**No**
Wauke:		Loko:	**No**
Olona:		Lokoia:	**No**
Noni:		Fishing Rights:	**No**
Hala:		Sea/Shore/Dunes:	**No**
Sweet Potatoes:		Auwai/Ditch:	**No**
Irish Potatoes:		Other Edifice:	**No**
Bananas:		Spring/Well:	**No**
Breadfruit:		Pigpen:	**No**
Coconut:		Road/Path:	**Yes**
Coffee:		Burial/Graveyard:	**No**
Oranges:		Wall/Fence:	**No**
Bitter Melon/Gourd:		Stream/Muliwai/River:	**No**
Sugar Cane:		Pali:	**Yes**
Tobacco:		Disease:	**No**

Koa/Kou Trees:		Claimant Died:	**No**
Other Plants:		Other Trees:	
Other Mammals:	**No**	Miscellaneous:	**government road**

No. 5250D, Kekuahani
F.T. 125v8

The claimant, sworn, that he had written the claim and have sent it to the Land Commission.

Inihia, sworn, The claimants land are of two pieces.

No. 1 is kalo and kula land in the Ahupuaa of Keopuka & Loiloa.
No. 2 is kula land in the Ahlupuaa of Keopuka & Loiloa.

The claimant received these lands from Ikoa, Konohiki for Loiloa in the year 1839. His title has never been disputed.

No. 1 is bounded:
Mauka by Aupuni
Koolau by pali of Keopuka
Makai by sea shore and Liloa
Wailuku by Keopuka Aina.

No. 2 is bounded:
Mauka and all sides by Aupuni.

N.T. 6v7
No. 3715B, Kekuahani, July 18 1849

Inihia, sworn,

Section 1 - Taro pasture in Keopuka.
Section 2 - Taro pasture in Loiloa.
Section 3 - Olona pasture in Loiloa.

Land from Ikoa in 1839.

Section 1:
Mauka by Government road
Hana by Keopuka pali
Makai by Liloa/Keopuka pali
Wailuku by Ke.

Section 2 - Surrounded by government boundaries.

[Award 3715B; R.P.7518; Loiloa Haiku Koolau; 2 ap.; .48 Ac.; See No. 5250D for F.T. document; 5250D not awarded]

A.1 03715B Keuoho, Luka

Number: 03957B

Claim Number:	**03957B**		
Claimant:	**Keuoho, Luka**		
Other claimant:	Kenoha		
Other name:			
Island:	**Maui**		
District:	**Koolau**		
Ahupuaa:	**Makaiwa, Kolea, Moolua, Punaluu**		
Ili:	**Punaluu**		
Apana:	**5**	Awarded:	**1**
Loi:		FR:	
Plus:		NR:	
Mala Taro:		FT:	
Kula:		NT:	**439v5**
House lot:		RP:	**4109**
Kihapai/Pakanu:	2	Number of Royal Patents:	**1**
Salt lands:		Koele/Poalima:	**No**
Wauke:		Loko:	**No**
Olona:		Lokoia:	**No**
Noni:		Fishing Rights:	**No**
Hala:		Sea/Shore/Dunes:	**No**
Sweet Potatoes:		Auwai/Ditch:	**No**
Irish Potatoes:		Other Edifice:	**No**
Bananas:		Spring/Well:	**No**
Breadfruit:		Pigpen:	**No**
Coconut:		Road/Path:	**No**
Coffee:		Burial/Graveyard:	**No**
Oranges:		Wall/Fence:	**No**
Bitter Melon/Gourd:		Stream/Muliwai/River:	**No**
Sugar Cane:		Pali:	**No**
Tobacco:		Disease:	**No**
Koa/Kou Trees:		Claimant Died:	**No**
Other Plants:		Other Trees:	
Other Mammals:	**No**	Miscellaneous:	

No. 3957B, Luka or Kenoha, See K, July 2, 1849
N.T. 439v5

Kalama, sworn, He has seen Luka's land Makaiwa in Koloa of Koolau land it is an old land from Kauluha before 1819.

Section 1:
Mauka by Waonahele
Hana by Kekua's land
Makai by pali
Hamakua by Nawaihi's land.

Section 2 Kihapai in Punaluu.
Mauka by Ku
Hana and Makai by pali
Hamakua by stream.

Section 3 Kihapai in Kolea.
Mauka by Pahupu's land

Hana and Makai by pali
Hamakua by Pahupu's land.

No one has objected to him.

[Award 3957B; R.P. 4109; Kolea Koolau; 2 ap.; .91 Ac.; Makaiwa Koolau; 1 ap.; 13 Acs; Moloa Koolau; 1 ap.; .19 Ac.; Punalau Koolau; 1 ap.; .88 Ac; Punaluu Koolau; 3 ap.; 1.36 Acs]

Cultural Impact Assessment
for the Kolea Reservoir Decommissioning Project,
Kolea Ahupuaʻa, Hāna District,
Maui Island
TMK: [2] 1-1-001:050

Prepared for
Oceanit Laboratories, Inc.

FINAL

Prepared by
Colleen Medeiros Dagan, B.S.
and
Hallett H. Hammatt, Ph.D.

Cultural Surveys Hawaiʻi, Inc.
Maui, Hawaiʻi
(Job Code: MAKAIWA 2)

July 2010

Oʻahu Office
P.O. Box 1114
Kailua, Hawaiʻi 96734
Ph.: (808) 262-9972
Fax: (808) 262-4950

www.culturalsurveys.com

Maui Office
1993 Main Street
Wailuku, Hawaiʻi 96793
Ph: (808) 242-9882
Fax: (808) 244-1994

Acknowledgements

Cultural Surveys Hawai‘i (CSH) would like to extend our thanks and gratitude to the people who have contributed their time and personal knowledge to this study. Without the assistance of these individuals, this study would not have been possible. Many thanks to Mr. Garrett Hew who put CSH in contact with the Tateyama family of Kailua and Waikamoi, East Maui. It is difficult to find individuals familiar with remote locations such as those of the study area and our gratitude goes out to this family for taking the time to share their knowledge and memories for this study.

Management Summary

Date	July 2010 (FINAL)
Project Number (s)	CSH Job Code: MAKAIWA 2
Project Location	Kolea Reservoir and Dam, Kolea Ahupua‘a, Hāna District, Maui Island, TMK (2) 1-1-001:050
Land Jurisdiction	State: Department of Land and Natural Resources (DLNR) Private (Lessee): East Maui Irrigation Company (EMI)
Agencies	Private: East Maui Irrigation Company State: State of Hawai‘i Department of Land and Natural Resources
Project Description	At the request of Oceanit Laboratories, Inc., Cultural Surveys Hawai‘i, Inc. conducted a Cultural Impact Assessment (CIA) for the Kolea Reservoir Decommissioning Project, Kolea Ahupua‘a, Hāna District, Maui Island, TMK (2) 1-1-001:050. Through an assessment conducted by the State of Hawai‘i, Department of Land and Natural Resources, Engineering Division, it was found that the Kolea dam and reservoir are no longer necessary. The intent of the decommissioning project is to breach the existing dam and restore the reservoir its natural streambed environment.
Region of Influence (ROI)	The area of direct effect for the proposed undertaking is considered the approximate 4-acre area of potential effect (APE). When assessing the presence or absence of direct, indirect, and cumulative effects of the project on the traditional cultural practices of this region, traditional use and access to resources from the mountains to ocean, or *mauka* to *makai* must be taken into consideration. As such, the ROI for this undertaking is defined as the geographic area encompassing the *ahupua‘a* of Kolea.
Regulatory Context	This cultural impact assessment was conducted per the requirements of the Hawaii State Office of Environmental Quality Control (OEQC) subject to Hawai‘i Administrative Rules (HAR) Title 11 Chapter 200-4(a) and Chapter 343 of the Hawai‘i Revised Statutes (HRS). This cultural impact assessment follows the Guidelines for Assessing Cultural Impacts as set forth by the OEQC.
Fieldwork Effort	Field work was conducted by Todd McCurdy M.A. and Colleen Medeiros Dagan, B.S. and consisted of a field inspection of Kolea, Waikamoi and O‘opuola Streams. Interview with the Tateyama family

	of Kailua was conducted by Colleen Medeiros Dagan, B.S.
Recommendations	Based on the background research of the area and the community consultation process, it is recommended that the best management practices regarding stream restoration be enforced during the decommissioning process as eventual restoration of this portion of Kolea Stream takes place. All efforts should be made to reduce silt runoff downstream and maintain a healthy stream environment. Additionally, it is recommended that *mauka-makai* access be maintained to both the bamboo forest for the collection of *takenoko* (bamboo shoots) and potential gathering of other forest resources as well as access to the coast for fishing. Finally, a sensitive approach should be taken as the decommissioning of the Kolea Reservoir proceeds with regards to the legal issues ongoing between EMI and east Maui taro farmers.

Table of Contents

List of Figures

List of Tables

Section 1 Introduction

1.1 Project Background

At the request of Oceanit Laboratories, Inc., Cultural Surveys Hawai‘i, Inc. conducted a Cultural Impact Assessment (CIA) for the Kolea Reservoir Decommissioning Project, Kolea Ahupua‘a, Hāna District, Maui Island, TMK (2) 1-1-001:050 (Figure 1 and Figure 2). Through an assessment conducted by the State of Hawai‘i, Department of Land and Natural Resources, Engineering Division, it was found that the Kolea dam and reservoir are no longer necessary as the reservoir had not been in use for several years. The intent of the decommissioning project is to breach the existing dam and restore the reservoir its natural streambed environment. As part of this process, the proposed restored section of Kolea stream will include the creation of a series of spillways or check dams constructed of stacked cobbles in an effort to control sediment runoff.

The area of potential effect (APE) is approximately 4 acres, and is hereafter referred to as the "project area", while the entire *ahupua‘a* of Kolea is considered the ROI and will be researched and hereafter referred to as the "study area". Because Kolea Ahupua‘a is relatively small, research of neighboring *ahupua‘a* was conducted in an effort to compare the similarities and potentially apply the neighboring model to Kolea.

1.2 Scope of Work

The following scope of work was carried out for this study:

1. Examination of historical documents Land Commission Awards, historic maps, with the specific purpose of identifying traditional Hawaiian activities including gathering of plant, animal and other resources or agricultural pursuits as may be indicated in the historic record.
2. A review of the existing archaeological information pertaining to archaeological sited within the study area to reconstruct traditional land use activities and to identify and describe the cultural resources, practices and beliefs associated with the parcel and identify present uses, if appropriate.
3. Interviews with persons knowledgeable about the past and present cultural practices in the project area and its surrounding area. We anticipate both formal and informal interviews.
4. Preparation of a report on items 1-3 summarizing the information gathered related to traditional practices and land use. The report will assess the impact of the proposed undertaking on the cultural practices and features identified.

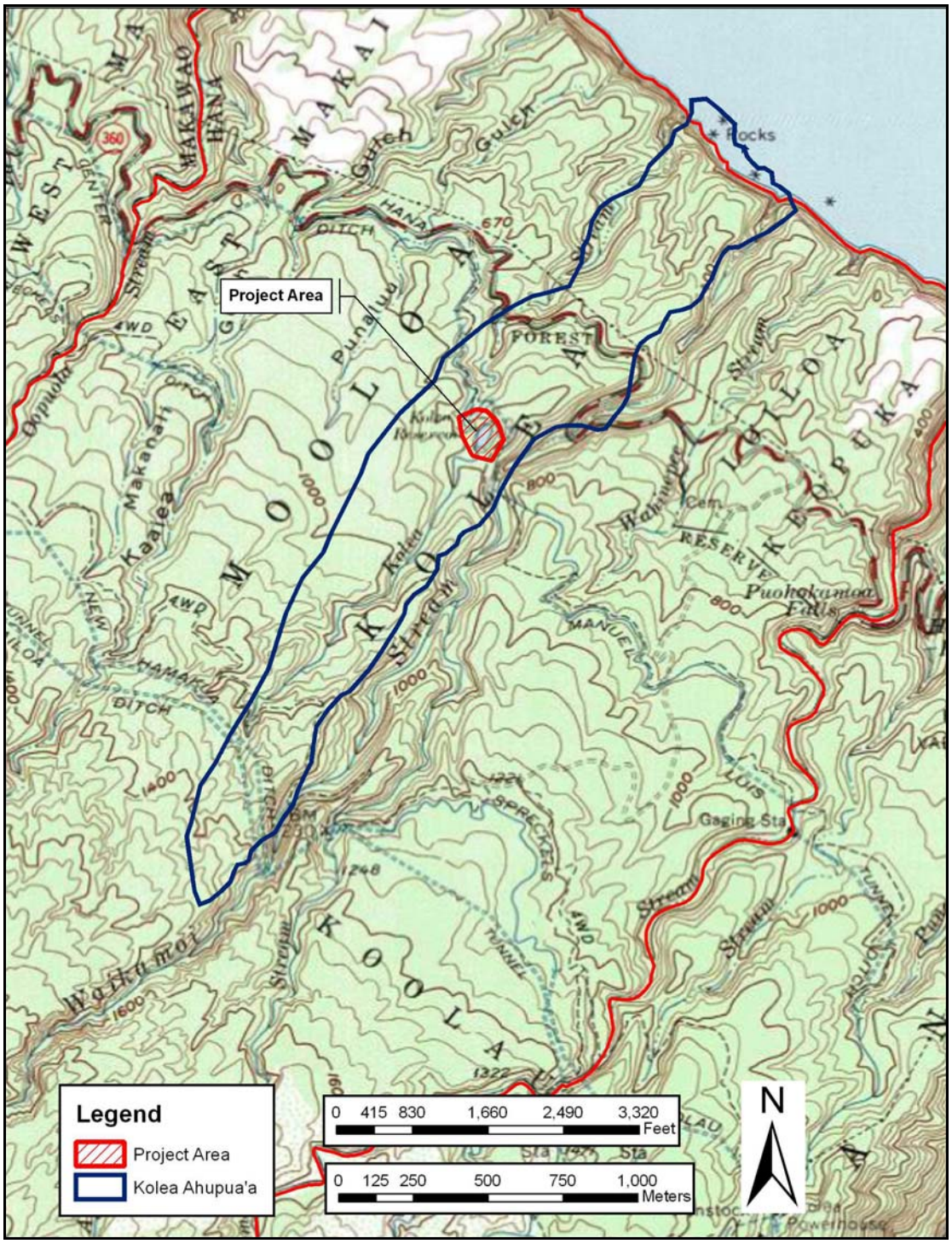


Figure 1. A portion of the USGS 7.5’ topographic map, Ke‘anae Quadrangle (1983) showing both the project area and overall study area.

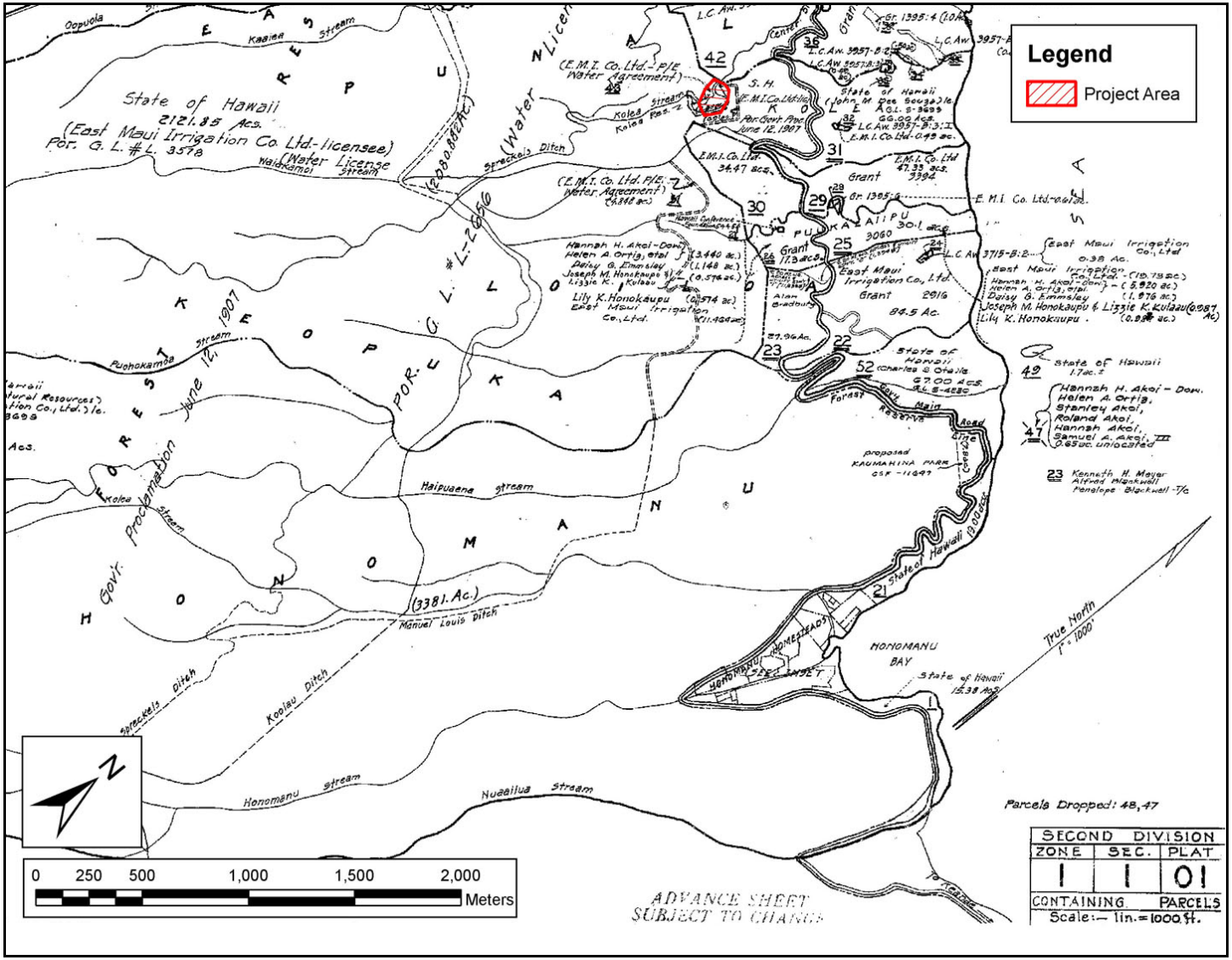


Figure 2. A portion of TMK (2) 1-1-001 showing the location of the project area.

1.3 Environmental Setting

1.3.1 Natural Environment

Kolea Ahupua‘a is located in between Mo‘oloa Ahupua‘a to the west and Loiloa Ahupua‘a to the east. The Kolea Reservoir is located along Kolea Stream at the 800-foot contour and approximately 1.15 kilometers from the coastline (Figure 3). Soils in the area are described as Rough Mountainous Land (rRT). Occurring in mountainous areas throughout the Hawaiian Islands, it consists of very steep land broken up by numerous intermittent drainage channels. The soils of the rRT soil unit are shallow with the representative stratigraphy generally consisting of 0-25 cm of soil over saprolite. (Foote et al. 1972:119).

The average rainfall in the vicinity of the project area is between 120” and 160” with the heaviest rainfall occurring in the winter months (Giambelluca et al. 1986:57). In this region of the island the soil type and precipitation rate support a wet forest and woodland ecosystem (Pratt and Gon 1998). As a result of land alteration activities associated with water diversion the ecosystem has been modified. The current environment around the Kolea Reservoir consists of introduced florae including Swamp mahogany (*Eucalyptus robusta*), Chinese banyan (*Ficus microcarpa*), Paperbark (*Melaleuca quinquenervia*) and Moreton Bay fig (*Ficus Macrophylla*).

1.3.2 Built Environment

While water diversion ditches built for the irrigation of sugarcane wind throughout the Ko‘olau Moku, The built environment of the project area is limited to the features of the Kolea Reservoir and an un-improved access road that begins near the Waikamoi Forest Ridge trailhead ends atop the crest of the reservoir dam (Figure 3). A wood-framed catwalk extends from the crest of the dam approximately 12 m straight out into the reservoir with a control wheel at its end, presumably to open and close the outlet. The exiting water is re-directed from Kolea Stream into the center ditch for the purpose of irrigation.

Figure 3. Overview of the Kolea Reservoir, view north.

Section 2 Methods

2.1 Field Methods

In an effort to attain a more thorough understanding of the topography of the study area and likelihood for crop cultivation, fishing resources and forest resources, as well as evidence of historic and pre-contact habitation, a field visit of the Kolea, Waikamoi and the O‘opuola streams was conducted. The fieldwork component of the cultural impact assessment was accomplished on June 8, 2010 by CSH archaeologists and historical researchers, Todd McCurdy, M.A. and Colleen Medeiros Dagan, B.S., under the general supervision of Hallett H. Hammatt, Ph.D. The fieldwork required approximately 6.5 person-hours to complete.

2.2 Document Review

Background research included a review of previous archaeological studies and mitigation plans on file at SHPD/DLNR and a review of documents, books and maps at the Cultural Surveys Hawai‘i library. Land Commission Award documentation was researched using the Waihona ‘Āina online database and previous reports. Additionally, documents, books and maps were consulted at the Maui Historical Society and Wailuku Public Library. Other sources such as the World Wide Web were utilized as needed.

2.3 Scoping and Community Outreach

2.3.1 Government Agencies, Advisory Councils, Local Community Organizations and Hawaiian Cultural Practitioners

In order to identify individuals with knowledge of the traditional cultural practices of the area of potential effect for the proposed project as it relates to this study, CSH initiated contact with government agencies, advisory councils, and local community organizations (Section 4). Letters and project area maps showing the location of the Kolea Ahupua‘a were mailed out with the following accompanying text ():

> At the request of Oceanit Laboratories, Inc., Cultural Surveys Hawai‘i, Inc. (CSH) is conducting a Cultural Impact Assessment (CIA) for the proposed Kolea Reservoir Decommissioning Project, located in Kolea Ahupua‘a, Hāna District, Maui Island, TMK (2) 1-1-001:050. An archaeological inventory survey of the project site is also being conducted by CSH along with the CIA. The Kolea Reservoir is located along Kolea Stream at the 800-foot contour and approximately 1.15 kilometers from the coastline (Figures 1 & 2).
>
> The purpose of this project is to decommission the dam at Kolea Reservoir. East Maui Irrigation Co., Ltd. currently owns and operates the reservoir and associated dam that was originally built in 1901. With funding from the State of Hawai‘i, the plan is to remove a portion of the existing embankment in order to make the dam non-functional. The amount of flow to Kolea Stream will remain unchanged.

The area in and around the reservoir that will be affected is approximately 4 acres. For the CIA portion of this project, the entire Kolea Ahupua‘a will be researched.

The purpose of the CIA is to evaluate potential impacts to traditional cultural practices as a result of the proposed project.

We are seeking your *kōkua* or help and guidance regarding the following aspects of our study:

General history and present and past land use of the project area.

Knowledge of cultural resources which may be impacted by the Kolea Reservoir Decommissioning Project - for example, traditional plant gathering sites, historic sites, archaeological sites, and burials.

Knowledge of traditional gathering practices in the area – both past and ongoing.

Cultural associations of the project area, such as legends and traditional uses.

Referrals of *kūpuna* or elders who might be willing to share their cultural knowledge of the project area and the surrounding *ahupua`a* lands.

Any other cultural concerns the community might have related to Hawaiian cultural practices within the Kolea Ahupua‘a and/or in the vicinity of the proposed Kolea Reservoir Decommissioning Project area.

We invite you to contact us, Anna Cordova and/or Colleen Medeiros Dagan, at 1-808-242-9882. You may also contact us by e-mail at acordova@culturalsurveys.com and cdagan@culturalsurveys.com if you have any information you would like to share.

Mahalo,

Anna Cordova, Archaeologist

Colleen Medeiros Dagan, Archaeologist

Section 3 Background Research

The division of Maui's lands into political districts occurred during the rule of Kaka‘alaneo, under the direction of his *kahuna*, Kalaiha‘ōhi‘a (Beckwith 1970:383). This division resulted in twelve districts during traditional times: Honua‘ula, Kahikinui, Kaupō, Kīpahulu, Hāna, Ko‘olau, Hāmākua Loa, Hāmākua Poko, Wailuku, Ka‘anapali, Lahaina, and Kula. The current project area is located on the windward flank of Haleakalā in the traditional district or *moku* of Ko‘olau and *ahupua‘a* of Kolea.

This section contains a summary of the rich traditional historic background associated with the Ko‘olau Moku. In addition, this section details the previous archaeological investigations in the vicinity of the current project area.

3.1 Traditional and Historical Background

3.1.1 Mythological and Traditional Accounts

Ko‘olau Moku, on the northeast coast of Maui is located in between Hāmākua Loa Moku to the west and Hāna Moku to the south. A translation of *Ko‘olau* is "windward" (Pukui, et al. 1974:117). Although Ko‘olau Moku extends from O‘opuola Pt. to beyond Nahiku, the lands from Ke‘anae to Wailua are considered to be representative of the traditional cultural landscape for the Ko‘olau region as a whole (Handy, et al. 1991:499-501).

Oral tradition passed from down from one generation to the next provides valuable insight into the pre-Contact cultural landscape of Ko‘olau Moku. The waters that feed this verdant region were said to have been brought forth by the god Kāne, who thrust his *kauila* staff into solid rock to bring forth the waters of Ke‘anae (Beckwith 1970:64). Another tale tells of a famous shark of Ko‘olau called Hi‘u (the tail of a fish) (Sterling 1998:109; Youngblood, et al. 1983:92):

> According to this story, two families in the area used to exchange food, a common practice, the couple living seaside at Ke'anae giving fish and the couple living upland giving garden produce.
>
> One day the woman from the shore gave her sister-in-law on the hillside nothing but a fishtail in exchange for bananas and sweet potatoes. The woman took the fishtail home in her calabash, saying nothing about the scanty trade.
>
> That night both she and her husband dreamed of a shark, and when they woke up in the morning they found a live shark swimming around in the calabash, where only a tail had been the night before.
>
> The excited couple freed the shark in an upland pool and made offerings to it. During a heavy rain, the shark was washed down to the ocean, where…it lives to this day in an underground cave near Ke'anae wharf.

Studies of the history of land use indicate that lands within the Ko‘olau Moku were intensively and continuously used for wetland taro cultivation or *lo‘i* agriculture from the pre-Contact era up until the present day (Group 70 International, et al. 1995; Handy, et al. 1991)(Figure 4). Ke‘anae typically sets the example for traditional pond field cultivation in the Ko‘olau Moku. Although it is unique because it was engineered by ancient Hawaiians. The Ke‘anae peninsula and was not naturally an ideal location for *lo‘i,* as it was mostly barren lava. It is said that in an effort to empower Ke‘anae from the neighboring Wailua, an unnamed chief ordered his subjects to carry soil down from the valley, where they lived at the time, to the peninsula where they literally deposited this soil which over the years became the productive *lo‘i* systems present today (Handy, et al. 1991:500). In addition to extensive *lo‘i* terracing and associated temporary habitation features, Land Commission Award testimony also indicates that the cultivation of the *olona* plant and gathering of *olona* fibers were also important parts of the traditional economy in the Ko‘olau area.

With regard to political influence and the course of Hawaiian history, it has been noted that there may have been some rivalry within Ko‘olau Moku between the *ahupua‘a* of Ke‘anae and neighboring Wailuanui. This rivalry, however, would give way to larger political battles concerning the rule of Maui Island and the line of succession between the sons of Pi‘ilani (Kamakau 1992:22-29), and later, the consolidation of power and unification of the Hawaiian Islands under Kamehameha (Group 70 International, et al. 1995).

Chief Pi‘ilani united all of Maui under his rule during the 16th or 17th century. Pi‘ilani’s sons Lonopi‘ilani and Kiha-a-Pi‘ilani fought for control of Maui. Kiha-a-Pi‘ilani eventually took refuge at Hāna. While in Hāna, Kiha-a-Pi‘ilani took as his wife Koleamoku, who had been betrothed to Lonopi‘ilani, which again put the two brothers to warring. Kiha-a-Pi‘ilani and his wife Koleamoku fled to Hawai‘i Island to enlist the aid of Umi. Umi was married to Pi‘ikea, the daughter of Pi‘ilani (sister of Lonopi‘ilani and Kiha-a-Pi‘ilani), a marriage that had formerly brought peace between the islands of Hawai‘i and Maui. However, Umi sided with Kiha-a-Pi‘ilani and sent an invasion fleet to Hāna. In Hāna, at Ka‘uiki, Lonopi‘ilani's forces, under the command of Ho‘olaemakua, withstood the Hawai‘i forces for a while until a nighttime raid overwhelmed them. With this battle Kiha-a-Pi‘ilani gained control of Maui. Kiha-a-Pi‘ilani "is credited with finishing the paved road around the island (Ke Alaloa o Maui), which his father (Pi‘ilani) had begun ... and restoring Honua‘ula *heiau* just inland of Pu‘u Ka‘uiki" (Griffin 1987:9).

During the last half of the 18th century the battles between Maui and Hawai‘i were carried on by the high chiefs Kahekili of Maui and Kalani-‘opu‘u of Hawai‘i. Kalani-‘opu‘u was in control of the Hāna and Kīpahulu areas from ca. 1759 to 1765 when Kahekili won out. However, the Hawai‘i forces were able to regain control from ca. 1775 to 1783. In 1778, when Capt. James Cook’s ships returned from their North American explorations, they stopped off Hāna but didn’t land. Kalani-‘opu‘u and Kamehameha both visited Cook’s ships, indicating who controlled the Hāna area. With the death of Kalani-‘opu‘u in 1782, Kahekili regained control of Hāna, which he retained, though not without further battles with Hawai‘i Island forces (i.e. Kamehameha), until his death in 1794. With the death of Kahekili and the assistance of newly acquired foreign power (canons, muskets, men) Kamehameha gained control not only of Maui, but of all the Hawaiian Islands, except Kaua‘i, by 1795.

Figure 4. Portion of the Dodge 1885 map showing the location of Kolea Reservoir in relation to traditional land divisions.

3.1.2 Early Historic Period

Following western contact and unification of the islands under a single ruler, and as a result of the shift from traditional Hawaiian land tenure to one based on western principles of private ownership through the execution of the Māhele, the influx of foreign interests and the introduction of rice as a cash crop began to change the cultural demographic of Ko‘olau Moku. The Hawaiian communities became more concentrated rather than dispersed throughout the region following the mid-19th century Māhele. When opportunities for land purchases through Royal Patent Grants arose, Hawaiians from the Ke‘anae area began to acquire these grants primarily for *kula,* or pasture lands, as either a single owner or as a *hui* or co-op (Linnekin 1983:185; 1985:24-25). There were twenty-one Royal Patent Grants issued in the Ke‘anae region (769.35 acres) alone, all but one going to Hawaiians (Linnekin 1985:24-25). The primary thrust, it seems, for the formation of the *hui* ventures and acquisition of these *kula* lands was to regain access to upland resources. A corollary effect of the formation of these land *hui* and the acquisition of *kula* lands was a greater retention of acreage by Hawaiians from Ke‘anae, thus effectively preventing foreign interests from developing sugar plantations or cattle ranches along the *mauka* portions of the region (Linnekin 1983:181-185).

In the second half of the 19th century, the market for rice grew markedly with an increasing demand from Chinese laborers working on the sugar plantations in Hāna. With a pond field irrigation system already in place in Ke‘anae, the region was ripe for conversion from taro cultivation to rice. It was common practice for Chinese entrepreneurs to lease former *lo‘i kalo* lands from Hawaiian owners for rice cultivation (Group 70 International, et al. 1995:28). Tax records for 1890 indicate that the rice lands in Ke‘anae and Wailuanui comprised approximately 67.84 acres out of a total of 163.322 acres in pond-field agriculture. Two years later, this number rose to 75 acres in Ke‘anae and Wailuanui while other lands on Maui (Honokowai, Waikapu, Wailuku, Waiehu, and Waihe‘e) registered a combined acreage of 175 (Group 70 International, et al. 1995:28) and (Linnekin 1985:30). The Chinese farming community flourished in Ke‘anae and with an increase in population came improvements to infrastructure needed to support more people as well as to facilitate accessibility to this once remote region of Maui. These improvements included the opening of the historic Hāna Belt Road and construction of necessary buildings associated with the rice plantations. Rice farming however would decline sharply following 1910 and by 1935 it had ceased entirely (Group 70 International, et al. 1995:36-37).

3.1.3 Land Commission Awards in the Immediate Area

Following the Great Māhele of 1848, two *kuleana* Land Commission Award (LCA) claims were awarded in the general vicinity of the Kolea Reservoir (see Table 1, Figure 5). The LCA information suggests that into the mid-19th century, the area surrounding the reservoir maintained a limited population with an economy focused on wetland agriculture. In addition there were also claims for *olona* and *kīhīpai*.

Table 1. Land Commission Awards near Kolea Reservoir (Waihona ‘Aina 2002).

LCA #	Claimant	Apana	‘Ili	Land Use
03715-B	Kekuahani	n=3	Keopuka, Loiloa	Lo‘i and Olona
03957-B	Keuoho, Luka	n=5	Punaluu	Agriculture

LCA #	Claimant	Apana	‘Ili	Land Use
	and Kenhoa			

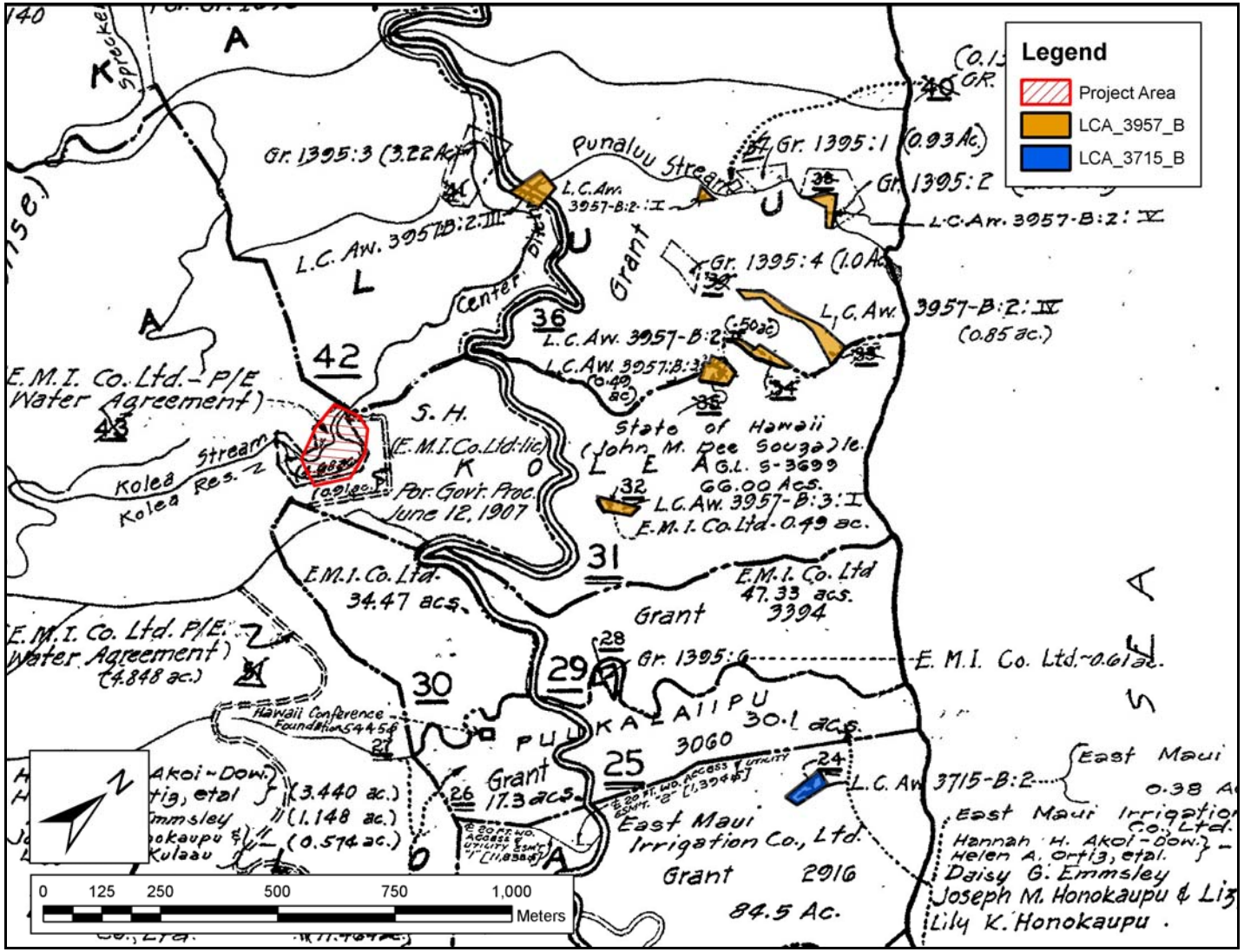


Figure 5. A portion of TMK (2) 1-1-001 showing LCA claims in Plat 001 in relation to the Kolea Reservoir.

3.1.4 1900s

Following the annexation of the Hawaiian Islands as a Territory of the United States in 1898, a county system of government was adopted. By 1905, Maui County had elected its first Board of Supervisors, hired its first road engineer, and established a system to appropriate money for road improvements (Maui News 1926) The “Belt Road” connecting Kahului with Hāna was given a high priority, with a general plan for its completion in place by 1910.

Prior to the construction of the Belt Road to Hāna, horse trails, developed when engineers constructed ditch systems between East Maui and the central Maui isthmus, were the only means of overland travel. Inter-island steamships made regular stops at the Ke‘anae Landing, but were considered expensive ($2.00 for deck passage). Travelers leaving Ha‘ikū on horseback for Ke‘anae descended and ascended 22 major valleys before arriving at Ke‘anae. Along the way, the traveler would have visited Native Hawaiian villages at Huelo, Kolia, Waiakamoi, Wahinepe‘e, Puahokamoa and Honomanū (Maui News 1926).

Writer George Bowser traveled to Ke‘anae on horseback in 1879, and described the village:

> My next halting place was the little hamlet of Keanae. There are here only few Kanaka huts and some patches of taro cultivation, but it is just the spot for the growth of the sugar cane, and has the benefit of a very good landing at which the steamer “Mokolii” calls about once a month. Mr. J.C. Garrett has a sugar plantation here, which was a delight to the eyes, as a contrast to the forest scenery I had been passing through. There are something like 2,000 acres here, all virgin land, capable of being turned account for the cultivation of the sugar cane.
>
> The native huts are generally constructed of a framework of bamboo, with something more substantial for uprights with rafters of bamboo for the roof. Over these a covering is laid of the native grass called pili, which will last for twenty years and will withstand the heaviest rains. Some huts, however, are covered with lauhala, which is the leaf of the puhala tree. The natives sometimes cook inside their huts. The sleeping place is on a raised platform about a foot and a half from the floor, and is covered with two or three layers of matting, also made of lauhala. I found these matting beds very comfortable to sleep upon and very suitable to the climate.
>
> Wailua is the name of the next place I arrived at, some two miles further on. Near the road from Keanae to here are several beautiful waterfalls. These, in the summertime, are beautified by perpetual rainbows. The Wailua Valley is about two miles square. There are here a church and a school house and a number of native houses, some of which are built of wood. For shooting, there is an abundance of wild turkeys and wild goats; plenty of fish of various sorts are always close at hand, oranges and wild bananas, mountain apples and guavas, all to be had for the picking.
>
> There is, in this part of the island, a species of taro which does not require irrigation. It is planted in rows the same way we plant potatoes, and it comes to

> maturity within the same time as the other species which needs to constantly be covered with water viz.: in about twelve months from the time of planting (Maui News 1926).

By 1922, the Belt Road had been completed between Kuiaha and Kakipi Gulch. In 1923, the County Board of Supervisors requested more prison labor for roadwork between Kailua and Ke‘anae. While road work continued toward Ke‘anae, survey work commenced between Ke‘anae and Kopili‘ula. In June 1925, the grand opening of the Kailua-to-Ke‘anae portion of the Belt Road was celebrated by a procession of automobiles to Ke‘anae. Territorial Governor Wallace Farrington dedicated the opening of the road with County Board of Supervisors Chairman Samuel Kalama and others (Maui News 1926) (Figure 6).

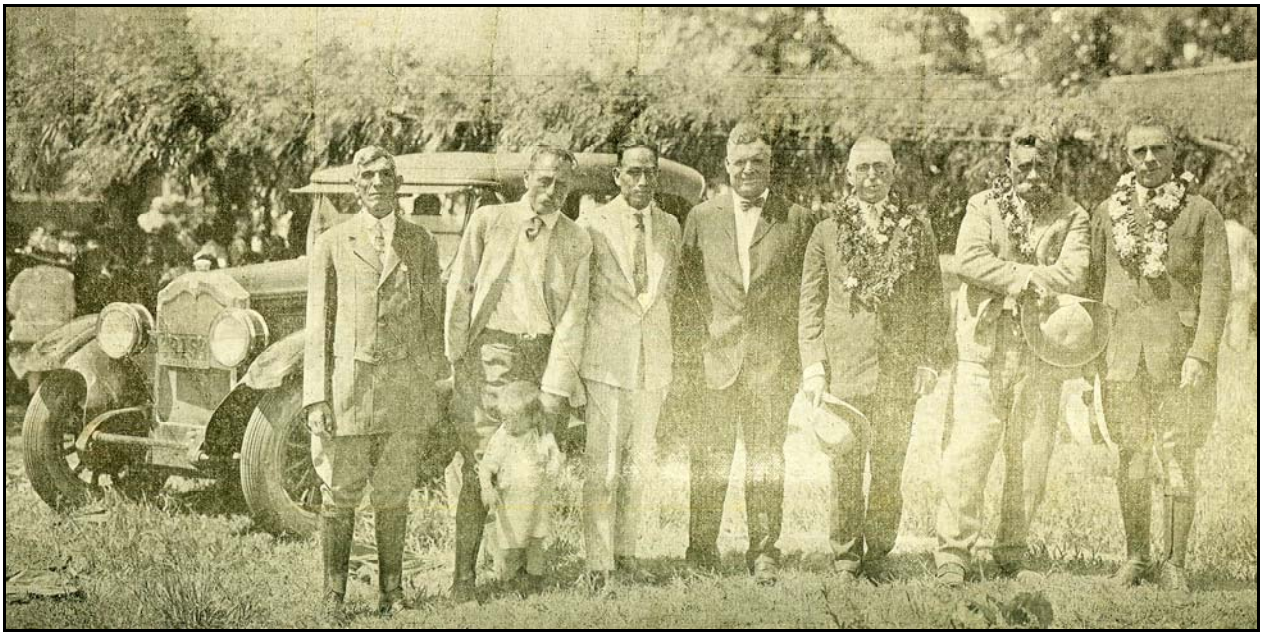


Figure 6. A group of Maui County Supervisors pose with Governor Farrington in Ke‘anae. Left to right: R.A. Drummond, W.F. Kaae, County Engineer P. Low, Sheriff C. Crowell, Governor W. Farrington, Chairman S. Kalama and D.T. Fleming.

On April 1, 1946 a *tsunami* generated by an earthquake in the Aleutian Islands off the coast of Alaska, struck the Ke‘anae Peninsula. The height of the *tsunami* run-up over two separate spots at Wailua was measured at 4.8 meters (15.7 ft.) and at 5.1 meters (16.7 ft.) (World Data Center 1977). The Lanakila Ihiihi O Iehowa Ona Kaua Congregational Church, constructed of coral and stone on the Ke‘anae Peninsula between 1857 and 1863, was the only structure left standing when the *tsunami* receded (Bartholomew 1994). Today, Ke‘anae and Wailua are a fretwork of working taro fields, small residential areas, and parks. Residents live on higher ground in Wailua, and send their children to school in Hāna, some 14 miles away.

3.2 Archaeological Studies

This section provides a brief overview of the research and findings of previous archaeological investigations in the general area of the current project (Figure 7 and Figure 8). Investigations including the current project area are discussed next followed by a summary of those conducted nearby (Table 2).

While there is a relatively high density of historic properties recorded within Ko‘olau Moku (Figure 8 and Table 3), few archaeological investigations have been conducted in the study area. Formal archaeological research began on Maui early in the twentieth century when Thomas Thrum began recording the *heiau* of Maui in the Hawaiian Annual from 1909 through 1918. By the conclusion of his study, Thrum had located 121 *heiau* on Maui (Thrum 1916). At the same time, J.F.G. Stokes documented many structures and heiau in Maui (Stokes 1917). However, the first attempt at a systematic island –wide survey was undertaken by Winslow Metcalf Walker from 1928 to 1929. The survey was commissioned by the Bishop Museum and focused on large sites and *heiau* around the island.

Table 2. Archaeological studies in the general vicinity of Kolea dam.

Author(s)/ Date	Location	Nature of Work	Findings
Stokes 1918	Island-wide	Search for heiau structures	Identified seven heiau in Ko‘olau Moku.
Walker 1931	Island-wide	Island-wide archaeological survey with a primary focus on monumental and/or ceremonial archaeology	Identified 20 heiau in Ko‘olau Moku, noted ten destroyed.
Palama 1981	Wailua Homestead	Archaeological field inspection	No findings
Group 70 et al. 1995	Keanae/Wailuanui	Archaeological inventory survey in conjunction with a cultural landscape study of the Wailua Nui and Ke‘anae irrigated taro complex	Identified three distinct taro field systems and defined the overlying cultural landscape of the region.
Haun and Henry 2003	Wailuanui Ahupua‘a	Archaeological inventory survey	Pre-contact temporary habitation site and trail

Stephen Palama (1981) conducted an archaeological field inspection of approximately 3.16 acres within Wailua Homesteads. This cursory field inspection did not locate any new historic properties.

Kukui o Puni Heiau (SIHP 50-50-07-096) was further described during a more recent archaeological cultural landscape investigation of three separate taro field systems found at Wailuanui and Ke‘anae (Group 70 International, et al. 1995).

Haun and Henry (2003) conducted an archaeological inventory survey of approximately 4 acres at Pauwalu in Wailuanui Ahupua‘a. The inventory survey resulted in the identification of one historic property, SIHP 50-50-07-5237, consisting of an overhang (Feature A) and trail (Feature B). The overhang was interpreted as a pre-contact temporary habitation shelter that was occupied between AD 1420-1650 and the trail as a transportation route.

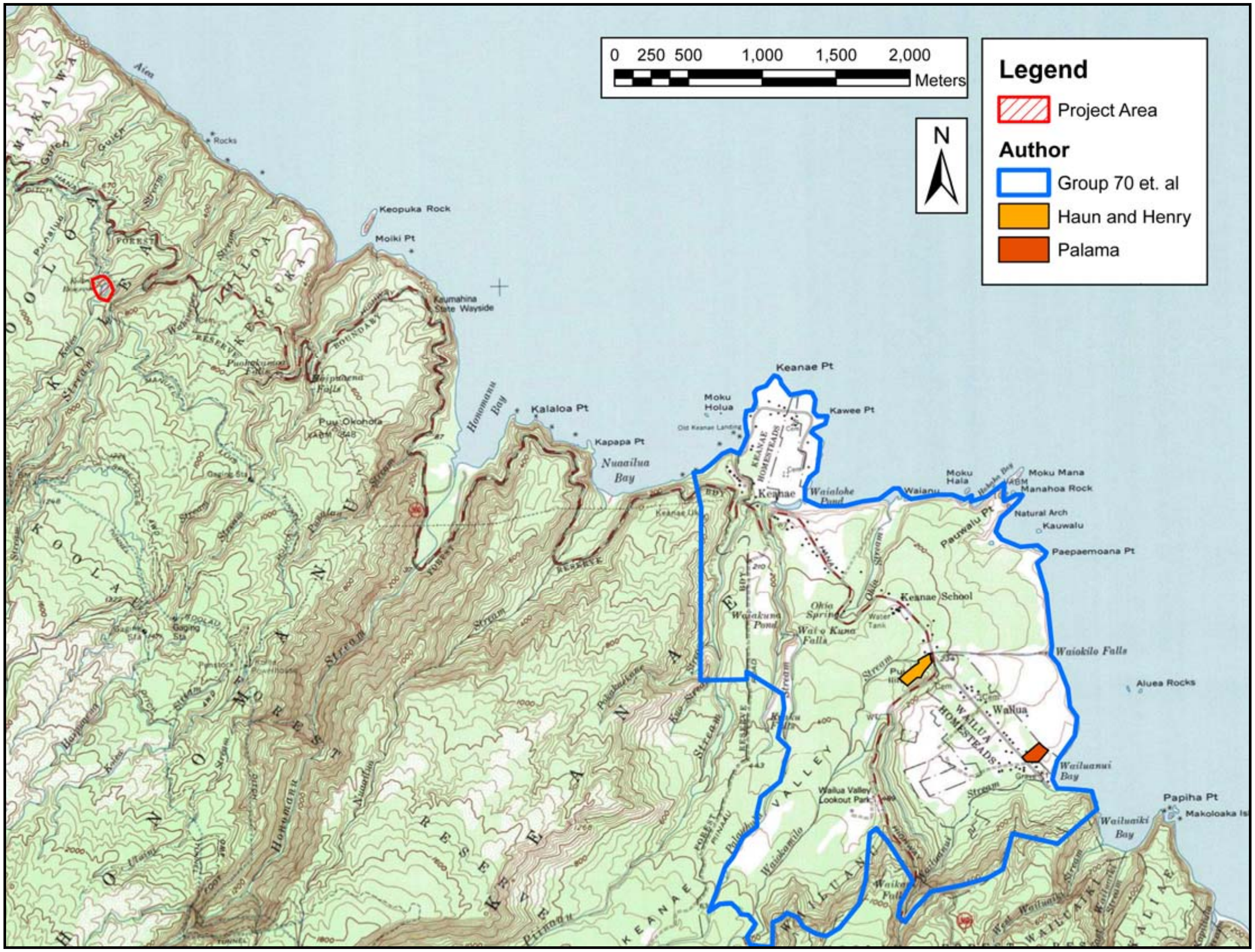


Figure 7. A portion of the 1983 Keanae 7.5-minute USGS topographic quadrangle showing previous archaeological studies in the vicinity of Kolea Reservoir

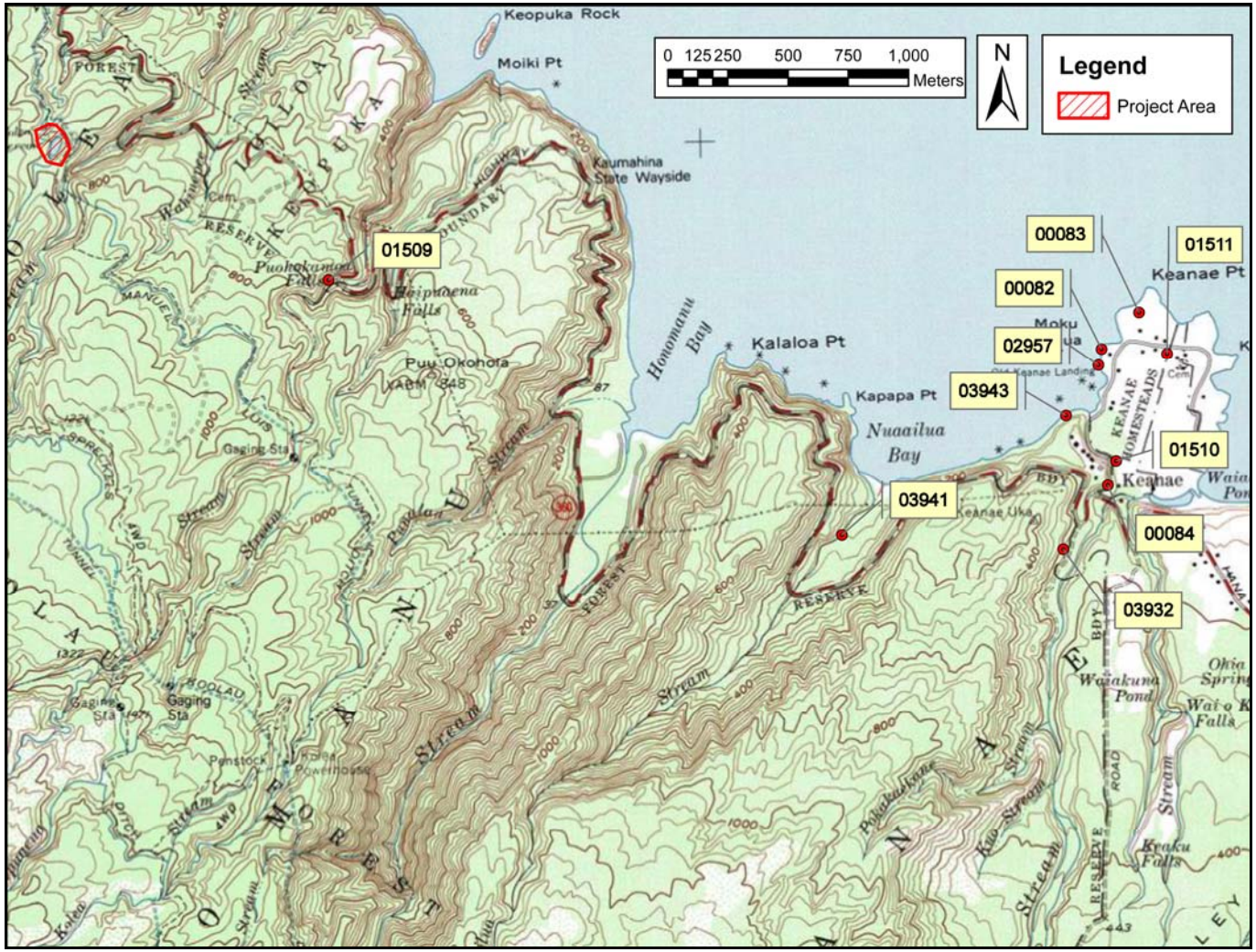


Figure 8. A portion of the 1983 Keanae 7.5-minute USGS topographic quadrangle showing the locations (Department of Land and Natural Resources, State Historic Preservation Division [DLNR/SHPD] 2004) of previously documented historic properties in relation to the Kolea Reservoir.

Table 3. Brief descriptions (Department of Land and Natural Resources 2004; Haun and Henry 2003) of previously documented historic properties in relation to the Kolea Reservoir

SIHP# 50-50-07-	Name	Ahupua‘a	Comments
00082	Kukuiolono Heiau	Ke‘anae	Destroyed
00083	Laloa Heiau	Ke‘anae	Destroyed
00084	Pakanaloa Heiau	Ke‘anae	Reported as a war heiau to Kanehikili; Destroyed
01509	Puohokamoa Bridge	Honomanu	Constructed in 1912, placed on Hawaii Register of Historic Places in 1974.
01510	Lin Hing Society Building	Ke‘anae	Placed on Hawaii Register in 1974; disassembled
01511	Lanakila Church	Ke‘anae	Established 1856
02957	Ke‘anae Landing	Ke‘anae	Historic boat/steamship landing
03932	Ke‘anae Arboretum Taro Complex	Ke‘anae	Comprised of 14 lo‘i and a main ‘auwai
03941	Nua`ailua Taro Complex	Ke‘anae	Site -03941 appeared to be an old, unmodified complex of lo`i sitting above and below Hana Highway. No size estimate given by CSH (1994 survey).
03943	Ke‘anae Quarry	Ke‘anae	Consists of historic quarry with rock crusher still in place. A stone platform within the quarry boundaries is said to be the grave of a worker killed in a quarry accident.

Section 4 Community Consultations

Cultural Surveys Hawai‘i Inc. contacted the following individuals and Hawaiian organizations requesting their *kōkua* and guidance regarding knowledge of traditional cultural practices and cultural resources of the study area. The following table represents all community consultations conducted with *kama‘āina*, Hawaiian cultural advisors and Hawaiian organizations. Individuals who expressed personal knowledge of the study area and gave their consent to share their *mana‘o* for this study, both formally and informally, are presented in Table 4. Formal letters of response to the scoping letter sent out by CSH have been appended to this study as Appendix B .

Table 4. Community Contacts

Name	Affiliation	Contacted[1]	Personal Knowledge (Y/N/S)	Comments
Mr. Terry Akuna	*Kama‘āina* from Wailua	N	Y	Referred by Mrs. Coochie Cayan-SHPD
Jas Akuna	*Kama‘āina* from Wailua	A	--	Referred by Nicole Spalding
Mr. Timothy Bailey	Aha Kiole Advisory Council	Y	--	CSH mailed formal letter of inquiry. Mr. Bailey e-mailed list of *kūpuna*.
Ms. Leslie Bruce	*Kama‘āina*	A		Referred to CSH by Mrs. Joann Carriera.
Mrs. Joann Carriera	*Kama‘āina* from Hana	A	--	Referred by Mrs. Thelma Shimaoka - OHA
Mrs. Mele Carroll	State Representative	A		Referred by Mrs. Coochie Cayan-SHPD
Ms. Phyllis “Coochie” Cayan	DLNR-State Historic Preservation Division, History and Culture Branch Chief	Y	S	CSH sent letter of inquiry. Mr. Cayan made referrals to Terry Akuna, Virgil Day, Kyle Nakanelua, Ed Wendt, Sen. Kalani English, Rep. Mele Carroll the Hawaiian Studies instructor at Hana High School and the Hana Senior Citizen community center. See

[1] Key:

Y=Yes
N=No
A=Attempted (at least 3 attempts were made to contact individual, with no response)
S=Some knowledge of project area
DC=Declined to comment
DP=Declined to participate
U=Unable to contact, i.e., no phone or forwarding address, phone number unknown

Name	Affiliation	Contacted[1]	Personal Knowledge (Y/N/S)	Comments
				Appendix B
Melody Cosma-Gonslaves	Teacher, Hawaiian Studies-Hana High School	A	--	Referred by Mrs. Coochie Cayan-SHPD
Mr. Virgil Day	*Kama‘āina* from Ke‘anae	A		Referred by Mrs. Coochie Cayan-SHPD
Jas Emmsley	Possible *Kama‘āina* from Ko‘olau Moku	N	N	Individual contacted not familiar with area.
A. Emmsley	Possible *Kama‘āina* from Ko‘olau Moku	A		Unable to contact.
Senator Kalani English		A		Referred by Mrs. Coochie Cayan-SHPD
Mr. Garrett Hew	East Maui Irrigation (EMI) employee	Y	S	Referred CSH to Mrs. Jean Igarashi and Mr. Stephan Cabral
Mrs. Hokulani Holt-Padilla	Cultural Practitioner – Maui Arts and Cultural Center	Y	N	Mrs. Holt-Padilla has a daughter who lives in Hana. Said she will try to contact her.
Ishay Honokaupu	Possible *Kama‘āina* from Ko‘olau Moku	A		Phone number out of service.
Severino M. Honokaupu	Possible *Kama‘āina* from Ko‘olau Moku	A		Unable to contact.
Ms. Pauahi Hookano		A		Unable to contact.
Mr. Bob and Mrs. Jean Igarashi	Granddaughter of Mr. Gojiro Tateyama, original ditch man for Waikamoi Stream	Y	Y	Formal Interview, See 5.2.1
Kahu Charlie Maxwell	Cultural Practitioner	Y	N	CSH sent letter of inquiry.
Ms. Nicole McMullen	Bailey House Museum/Maui Historical Society	Y	S	CSH sent letter of inquiry.
Mr. Kyle Nakanelua	*Kama‘āina* from Ke‘anae	A	--	Referred by Mrs. Coochie Cayan-SHPD. Phone number not in service.
Ms. Katrina Olivera	Ph.D in Geology (Maui)	Y	N	Ms. Olivera referred CSH to Pauahi Hookano of Wailua.
Ms. Terri Poaipuni	*Kama‘āina* from Hāna	A	--	Referred by Mrs. Thelma Shimaoka - OHA
Mr. Kiope Raymond	Maui Community College Hawaiian Language Professor	Y	N	CSH sent letter of inquiry. Mr. Raymond referred CSH to Ms. Katrina Kapa Olivera Ph.D.
Mrs. Thelma	Office of Hawaiian	Y	S	CSH sent a letter of inquiry. Ms.

Name	Affiliation	Contacted[1]	Personal Knowledge (Y/N/S)	Comments
Shimoaka	Affairs, Community Outreach Specialist Maui Island			Shimaoka referred CSH to Terri Poaipuni, Hoopai Waikoloa, Makala Waring, Rose Soon, Joann Carreira, and Timmy Bailey.
Mr. Stanley Solamillo	Maui County Cultural Resources Commission	Y	N	CSH sent a letter of inquiry.
Ms. Rose Soon	*Kama‘āina* from Hāna	Y	N	Referred by Mrs. Thelma Shimaoka - OHA
Mr. Mike Spalding	*Kama‘āina* lineal ties to Hāna	Y	S	CSH mailed formal letter of inquiry. See 5.1.3
Ms. Nicole Spalding	*Kama‘āina* lineal ties to Hāna	Y	N	Referred CSH to the Akuna family.
Hoopai Waikoloa	*Kama‘āina*	N	--	Referred by Mrs. Thelma Shimaoka - OHA
Makala Waring	*Kama‘āina* from Hāna	Y	N	Referred by Mrs. Thelma Shimaoka - OHA
Ed Wendt	*Kama‘āina* from Ke‘anae	Y	S	Mr. Wendt was Referred by Mrs. Coochie Cayan-SHPD. See 5.1.4
	Hana Senior Center	Y	N	Spoke with woman who said that the kūpuna at the Hana Senior Center are from Hana and likely not familiar with the CIA study area.
	Central Maui Hawaiian Civic Club	A		

Section 5 Kama‘āina Interviews

5.1 Informal Interviews

5.1.1 Stephen Cabral

Mr. Cabral was born in Nahiku, Maui in 1929. He went to work for East Maui Irrigation (EMI) after graduating from Hana High School in 1947. Most of his early jobs with EMI involved converting old California redwood ditches, ditch linings and flumes to new concrete conduits. In some cases, because of the curing time for the concrete that was being used, work was required to proceed around the clock.

Mr. Cabral explains that EMI had good sources for what he referred to as “Haleakala basalt” that was utilized as aggregate for the concrete. Mr. Cabral stated that this basalt came from a quarry at Honomanu Bay. He explains that due to the quality of this basalt, much of the concrete work done by Mr. Cabral remains in good condition with minimal cracking.

Regarding the Kolea Dam, he explains that all of the dam components seen there today dates to the original work done at the turn of the century. The stone work at the face of the dam, obscured today by bamboo, was delivered to the site by mule and ox and dumped in place from the stream level up. Earth was packed behind the dam face, and some rock was used from blasting at the spillway and from creating the rock face cut just south of the spillway. All rip-rap surfaces at the reservoir and at the lower water diversion ditch were hand-built. All cutting was by hand and by explosives. Concrete improvements at the Center Ditch diversion continued through the 1970’s, but he had not heard about any concrete work done there since. The reservoir walkway was an improvement constructed sometime in the 1970’s, prior to that, the reservoir control was built into the side of the reservoir dam crest.

5.1.2 Sam Ka‘ai

Mr. Sam Ka‘ai, *kūpuna* and cultural practitioner, is from Hāna and is familiar with the study area. He is aware of the water rights issues in process between EMI and east Maui taro farmers. Mr. Ka‘ai is skeptical of the motives of EMI as water rights have been used for political gain in the past. Mr. Ka‘ai asserts that globally we are in a time of imbalance.

Mr. Ka‘ai did share that Kolea stream was a place known for stone tool manufactureing, such as poi pounders. Because these items were formed here, discards could also be found here. He also said that taro patches and rice fields were cultivated along this stream until approximately 1946.

Mr. Ka‘ai also shared information about surrounding areas such as Honomanu. He said that the area and bay was called Hanamanu before the reign of Pi‘ilani. This area was a place of birds. The *koa‘e ula* or red-tailed tropicbird (*Phaethon rubricauda*) and the *koa‘e kea* the white-tailed tropical bird (*Phaethon lepturus*) both lived here. According to Mr. Ka‘ai, they are ground nesting birds and their populations at Honomanu have declined since the introduction of rats and mongoose. Another bird found within the CIA study area is the *kolea* or the golden plover (*Pluvialis fulva*). Mr. Ka‘ai said the *kolea* is known as the navigational bird because it migrates a

great distance between Hawai‘i and Alaska. Mr. Ka‘ai also shared the meaning of the place name Ke‘anae. He said that Upper Ke‘anae was known as Ke‘anae pi‘ina‘au, or the small intestines due to the narrow windy roads of the area. Ke‘anae was also referred to as the *pinao* or dragonfly. Mr. Ka‘ai explained that the Civil Conservation Corp now known as the YMCA planted all the exotic trees along the Hana Highway in this area. Mr. Ka‘ai said that yams of a white variety were known to grow along the coast of the study area and were known as *palaoa* which referred to their white coloring.

5.1.3 Mr. Mike Spalding

Mr. Mike Spalding is a *kama‘āina* with lineal ties to Hāna. Mr. Spalding is an avid swimmer, sailing canoe enthusiast, and boat captain. He described an observation he made while swimming past Makaiwa Bay (located two ahupua‘a west of Kolea) in the early morning hours. He observed a *puka* (hole) in the *pali* or cliff side from which the sun shone through casting rays that extended out in a bird like shape. It occurred to him that may be the reason the area is named "Makaiwa" the *puka* being the eye or m*aka* and the sun coming through it forming the *iwa* bird.

Mr. Spalding has also explored this valley on foot and said that there are remnant Hawaiian agricultural terraces. He describes the bay as being sheltered from the trade winds and northeast and northwest ocean swells. He thought researching the name of the western point of the bay, Kapuka‘amaui might offer some insight to the use or significance of the area. He was curious as to why the reservoir was being decommissioned.

5.1.4 Mr. Ed Wendt

He explained that he is involved in the water rights issues between east Maui taro farmers and East Maui Irrigation that include 27 rivers and streams in east Maui. He stated that the Kolea and the Waikamoi streams of the CIA study area are two of the 27 rivers and stream involved. East Maui taro farmers are demanding the release of water back into these streams. Mr. Wendt explained that although no one lives along the Kolea and Waikamoi Streams today, taro *lo‘i* were once located along their banks. Mr. Wendt explains that healthy streams need water flowing in them. He continues stating that care needs to be taken with regards to the earth’s natural process. He further notes that water has become a commodity used for development.

5.1.5 Anonymous Couple

While performing a filed inspection of the Kolea and Waikamoi stream valleys for this study, CSH team encountered a couple (who requested to remain anonymous) in the process of collecting *takenoko* (bamboo shoots). They were kind enough to describe the harvesting process explaining that you first find the bamboo shoots that are two to three feet high, then you remove the top 12 inches and pull of excess husks or leaves exposing is the edible portion. This couple said that they lived in Wailuku and traveled to this location specifically for collecting *takenoko*. They explained that the location is a known *takenoko* gathering area often utilized by senior citizens who are driven here by small bus.

5.2 Formal Interview

One formal interview was conducted for this study with the Tateyama family from Kailua, Maui. The digitally recorded interview was performed on May 19, 2010 at Bob and Jean Igarashi's home in Waipahu, Oahu. Mrs. Colleen Medeiros Dagan B.S. preformed the interview. The interview has been summarized by extracting traditional and cultural information. The Tateyama family requested that the full transcription of the interview remain private and not be amended to this document.

5.2.1 Tateyama 'Ohana: Mr. Bob and Mrs. Jean Igarashi, Mrs. Maureen Farineau and Mr. Shawn Tanaka

Mrs. Jean Igarashi and Mrs. Maureen Farineau are sisters who grew up in Kailua on the island of Maui, approximately two miles northwest of Kolea ahupua'a. Their father, Masato Tateyama was the fifth son born to Gojiro Tateyama and his wife, Tsuru Wakasugi. Gojiro Tateyama, born July 15, 1879, was a Japanese immigrant from Kenboku Mura, Tamana Gun, Kumamoto, Japan. Gojiro arrived in Honolulu on September 11, 1899. He came over on the ship, COPTIC. Tsuru, born on April 5, 1877, was from Oshima-Gun, Yamaguchi, Japan. She arrived in Hawaii on January 30, 1898 onboard the SS Mogul.

Figure 9. Gojiro Tateyama and his wife Tsuru Wakasugi (Photo courtesy of the Tateyama family).

When Gojiro arrived on Maui, he attained a job as a ditch man working for East Maui Irrigation Company (EMI) where his wages were $15.00 a month. He was responsible for keeping the irrigation ditches around Puohokamoa and Waikamoi clear of debris. A home was built for him along Waikamoi Stream. Jean and Maureen clarify that the area they knew as Kolea was close to the highway and extended towards the ocean, while upland or *mauka* was referred to as "Waikamoi". Gojiro and Tsuru had eight of their eleven children while living along the Waikamoi Stream. Their home was located *mauka* of the branch of the Kolea Stream and while living there Gojiro planted a variety of fruit trees including orange and grapefruit. Jean explained that Gojiro had brought bamboo from Japan and planted it around his house for *takenoko* or bamboo shoots. Jean and Maureen said that much of their grandfather's and their father's food was grown and gathered from around their home and the surrounding area. They used salt to preserve perishable foods.

Gojiro lived at this remote location along the Waikamoi Stream until 1915 when he moved his family to Kailua. He had three more children while living in Kailua. It was said that during this time the Hana Highway that extended beyond Kailua was a mule trail traversed on foot or on horseback. As children growing up in Kailua, Jean and Maureen recall visiting Waikamoi with their grandfather and father. Their father Masato, also known as "Masa", was the eldest son and was responsible for caring for his parents in their later years. Because of this Japanese tradition, Masa stayed in Kailua and raised his own family there. All of Gojiro's eleven children were sent to boarding schools. The girls attended Maunaolu Seminary and the boys attended Lahainaluna. And all except Masa left Kailua to live and raise their families elsewhere throughout the state.

As children growing up in Kailua, Jean and Maureen recall many excursions into Waikamoi Valley. They said that the main reason they visited was because their father, like their grandfather, attained a position with EMI and became responsible for the ditches of the area. Often times when he had to check on a ditch, he would take Jean and Maureen with him:

> *Maureen*: When he needed to see if any ditches needed to be cleaned of debris after a storm of branches.
>
> *Jean:* We helped.
>
> *Maureen:* Sometimes we would go to different reservoirs and turn that wheel to increase the water flow down the stream or close it more so that the reservoir would fill.

While out with their father they would swim in the ponds and collect fruits and *takenoko* or bamboo shoots. They were taught to take only what you needed for one or two meals:

> *Maureen* : We enjoyed, he would take us to the pond to swim.
>
> *Jean:* The taro leaf, when the grandchildren were little, dad would take water from the stream and use the leaf as a cup.
>
> *Maureen:* Just to see the crystal clear water roll off the taro leaf. That was shared with anybody who came with us, because you don't experience that in your yard, it was special from a fresh water stream. There was times when we would go

> fishing for catfish, in some of the ponds, but we always came back with enough food, mountain apple, rose apple, oranges, *pohole*, we would eat that raw too, and other days we caught *`opae* just enough for home use.

The sisters describe their father, Masa, as being very "fussy" about utilizing these resources properly and not wasting. Maureen describes how her father made nets for catching `opae:

> The net was made with guava branch.
>
> The branch with a Y was crossed and tied at the free end into an elliptical shape. Then mesh netting was over-sewn on the branch leaving one side open to form a 10" pouch. Attached (sewn) to the bottom of the mesh netting was a narrowburlap bag tunnel extension for the caught shrimp which had an opening at the end and tied so you could empty out what was caught in the extension. The net was placed perpendicular to the floor of the stream at it's width. Since the *`opae* hid under rocks, another person nearby upstream would slightly move the rocks to allow the *`opae* to float with the current downstream into the net.

Maureen said that she believes her father learned how to fashion an *'opae* net from Hawaiian friends that he worked with. Maureen also mentioned catching gold fish and frogs (frog legs) for their family's consumption. She explains that they were the only Japanese family living in Kailua amongst Hawaiian families, Filipino families and a Portuguese family.

Gojiro developed an arboretum in their back yard which Masa later cared for. He planted fruit trees and flowers, sweet potato and bougainvillea. He would give away flowers to anyone who wanted or needed. Masa had a natural affinity for nature and plants. He simply enjoyed growing plants, tending to them and sharing them with others. Maureen recalls the enjoyment she experienced being outdoors and gathering flowers with her grandfather.

While in Kailua, the Tateyama family continued the Japanese tradition of welcoming the New Year together. All relatives who lived on outer islands would fly back to Kailua for the celebration. Gojiro would raise a pig for the occasion and plant sweet potato and taro. The Filipino Castillo family slaughtered the pig for them and utilized the parts they liked, then the Tateyama's prepared *kalua* pig in a traditional Hawaiian *imu*. They pounded their own *poi* from either taro and when they didn't have taro, they pounded *ulu* or bread fruit. They said they learned and adopted Hawaiian traditions from the Hawaiian families they lived near. Their father's best friend, James Hueu, farmed the *lehua* variety of taro and watercress in Ke‘anae who often left large bags of the crops at the Tateyama household. To add to their multi-cultural lifestyle, they remember the stone oven that their Portuguese neighbors used for cooking bread, and recall with fondness eating the Portuguese bread.

In addition to their adopted Hawaiian traditions, they practiced the traditional Japanese tradition of pounding *mochi* (glutinous rice). Jean describes the stone bowl (*usu*) and guava wood pounders (*kine*) they used to pound the *mochi*. Maureen said they had adult sized *kine* and child sized as well. They steamed sweet mocha rice in a four level tray over an outdoor fire for their New Year celebration. Jean recalls having fresh cooked rice in hand as the *imu* was opened hoping for a piece of the crispy pork skin to eat with the rice.

Gojiro and Tsuru opened the Tokunaga Store in Kailua around 1919. Their home, store and town was the last settlement before Ke‘anae, much like today. This store became a pit-stop for families traveling to and from Ke‘anae and Hāna. Here they sold a variety of canned goods, such as pork and beans. They often housed travelers as well.

Figure 10. Tateyama family in front of the Tokunaga Store in Kailua (Photo courtesy of Tateyama family).

Jean and Maureen recall fishing with their grandfather Gojiro along the coast of Kolea. They said they would go to the forest to cut bamboo for their fishing poles and carry them down a cliff where there was a rope for repelling down. They utilized a dirt foot path to access the cliff side. They would fish from this location in the day and at night by the light of a kerosene lamp. They said they caught lobster (*scyllaridae*), *ulua* (*Carangidae sp.*) and eel (*Gymnothorax flavinarginatus*). They said they prepared the eel by filleting it, drying it and grilling it over a

fire. Other fishing areas they utilized fronted Honomanu Bay, further east. Here they caught *āholehole* (*Kuhlia sandvicensis*). Shawn Tanaka, Jean and Maureen's nephew, also familiar with the area said that the fish they caught in the "old days" were larger than any he has caught in modern times. The sisters also recall stories about homes that were located at Honomanu before their time. They produced a map which showed a coastal Waikamoi Village. But Jean and Maureen believe this village was also before their time, possibly established in the early 1900's and settled by Japanese rice farmers or other ditch men (Figure 11).

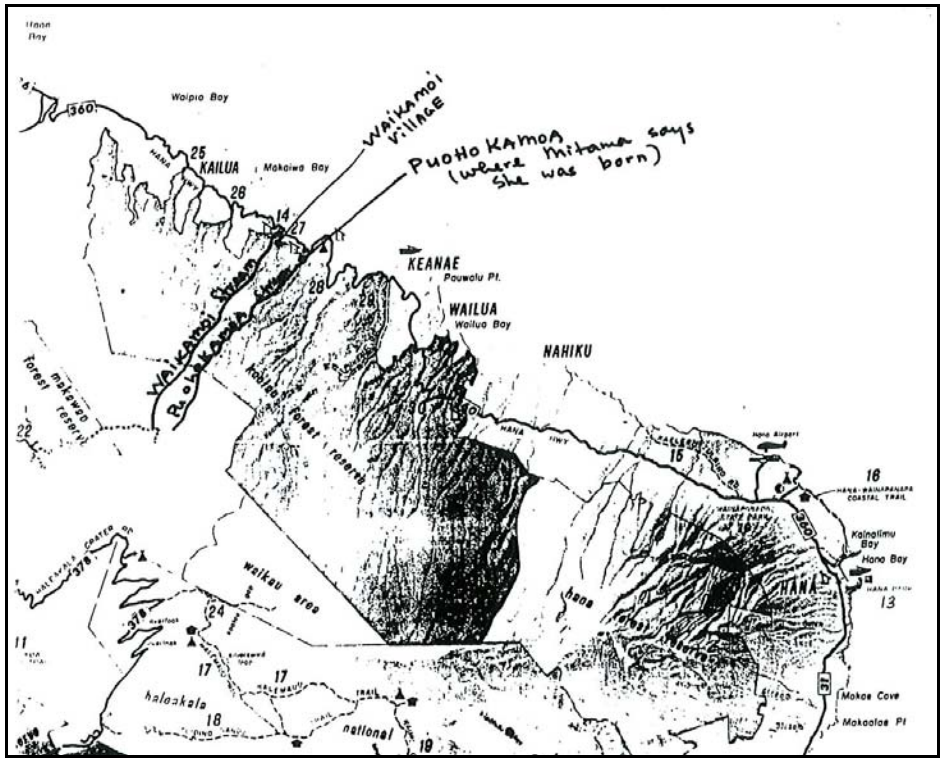


Figure 11. Map courtesy of Tateyama family with hand notation identifying a "Waikamoi Village" as well as the Puohokamoa Stream as being the location of Mitama's, Gojiro's daughter, birth.

In addition, Maureen and Jean recall learning to make hula implements as school children. The said they learned to make *'ulī'ulī* (feather gourd rattles) with chicken feathers and canna seeds for inside the gourd as well as collecting bamboo from a special bamboo patch for *pu'ili* (bamboo stick instruments). They also collected *'ili'ili* (water rounded pebbles) stones from Honomanu Bay.

In closing, Maureen recalls with great fondness the annual EMI *lu'au* in Kailua. She said that employees from Kailua, Ke'anae, Nahiku and Pa'ia would gather in Kailua every year for the event. All the families prepared food for the party and decorated the garage with foliage from the forest. Individuals and families would stay overnight to oversee the *imu*. They prepared *kalua* pig, sweet potato, *poi*, rice, potato salad, *'opae*, *opihi*, *kulolo*, *haupia* raw green onion and quartered round onion with Hawaiian salt, fresh *pohole* and cake. Music and entertainment was provided by any and all who attended.

Section 6 Traditional Cultural Practices

6.1 Hawaiian Habitation and Agriculture

There were two Land Commission Awards (LCA) located in the vicinity of the study area; LCA 3957 B and LCA 3715 B. Of the *apana* awarded for LCA 3957 B, one occurs in the Punaluu Ahupua‘a (immediately northwest of Kolea Ahupua‘a) another two are located in the Kolea Ahupua‘a, while another is located in Makaiwa, (the second *ahupua‘a* northwest of Kolea). Some of these *apana* were described as *kihapai*, small cultivated parcels of land not for use as taro *lo‘i* and for exclusive use by the Native tenant (Lucas 1995). No taro *lo‘i* were noted as being part of this claim.

As for LCA 3715 B, these claims were located in Loiloa, the *ahupua‘a* east of Kolea. This claim was said to contain three *apana*; two for taro pasture, likely dry land taro and one for *olonā* (*Touchardia latifolia*).

In Handy’s *Native Planters* it was said the O‘opuola Gulch marked the northwestern boundary of the Ko‘olau *moku* and that the streams of O‘opuola, Waikamoi (the main stream that feeds the Kolea Stream), Puohokamoa and Haipuena provided water to small *lo‘i*. Also mentioned by individuals consulted for this study was the large stream and valley of Honomanu. It was said that in ancient times this bay and valley supported a small population and that terracing was observed in the valley and that terraces and house sites were located in the flatlands above the valley (Handy, et al. 1991:498).

During field inspections of Kolea, Waikamoi and O‘opuola Streams, it was found that the sections of these streams examined were exceedingly narrow and steep. While the *makai* reaches of these streams were not accessed due to terrain and private property constraints, the observations made during the field visits concluded that cultivation of such rugged mountainous terrain would prove difficult. It is likely that the sparse number of LCA are due to the difficulty of crop cultivation in this marginal growing environment (see also Section 1.3.1 Natural Environment and the soils discussion) and that only the *makai* reaches of the study area at the mouths of the gulches would be suitable for small crop plots as reflected in the LCA claims.

Figure 12. Kolea Stream view west.

Figure 13. Waikamoi Stream view southwest.

Figure 14. O‘opuola Stream view southwest.

6.2 Gathering for Plant Resources

Through the consultation process it was found that there are individuals that currently utilize the study area for the collection of bamboo shoots or *takenoko*, a traditional Japanese food item. The Tateyama family explained that their grandfather brought a bamboo plant from Japan when he immigrated to Hawai‘i. They said that he planted bamboo around his home along the Waikamoi stream to use as a food resource (Section 5.2.1).

While performing a filed inspection of the Kolea and Waikamoi stream valleys for this study, CSH team encountered a couple (who requested to remain anonymous) in the process of collecting *takenoko*. They were kind enough to describe the harvesting process explaining that you first find the bamboo shoots that are two to three feet high, then you remove the top 12 inches and pull of excess husks or leaves exposing the edible portion. This couple said that they lived in Wailuku and traveled to this location specifically for collecting *takenoko*. They explained that the senior citizens also utilize the location and are driven here by small bus (Figure 15 and Figure 16).

Figure 15. *Takenoko* or bamboo shoot harvested from forest adjacent to Kolea reservoir and dam.

Figure 16. Bamboo shoot discarded husks, evidence of *takenoko* harvesting in the study area.

The Tateyama family also collected *takenoko* from the bamboo forests of the study area and from a bamboo patch located near Honomanu Bay. In addition, they collected *pohole* fern from a patch located at Honomanu. The Tateyama family explined that as children accompanying their father to the various ditch systems, they often gathered oranges, mountain apples, guavas and grapefruits.

Mr. Sam Ka‘ai described a white yam known as *palaoa* that was known to grow along the coast of the study area. Isabella Abbot in her book titled *Lā‘au Hawaii Traditional Hawaiian Uses of Plants* describes a white variety of yam called *ke‘oke‘o* which was white on the outside and inside and was used only for eating (Abbott 1992:39). It is possible that the two white yams described are the same variety and that the variation in the name could be a regional variation. In addition it was said that yams or *uhi* were planted throughout eastern Maui (Handy, et al. 1991:182).

6.3 Aquatic Resources

In addition to the plant resources utilized from within and surrounding the study area, both freshwater and marine resources were identified as being located within the study area. The Tateyama sisters described fishing with their grandfather from a cliff side location accessible by way of a rope. They recall cutting their own bamboo poles from the forest and carrying them down the cliff side along the Kolea coast. They describe it as being very rugged and describe following a dirt road to access the cliffs. Maureen Farineau said the cliff was about thirty feet high. She said they caught eel, lobster and *ulua*. The Tateyama family also described fishing and swimming at Honomanu Bay. In addition, it was said that at Honomanu Bay a small settlement existed in ancient times that utilized the bay as a fishing canoe launching site (Handy, et al. 1991:498).

Freshwater resources would include *‘ōpai* (shrimp) caught using a hand crafted fishing net. She described how her father made their nets which were fashioned from a guava stick and burlap bag which he learned how to make them from his Hawaiian co-workers. The net was made as wide as the stream and one would place the net at a location downstream while another lifted rocks upstream which caused the shrimp to either be swept or scared downstream and into the net (see Section 5.2.1.). Maureen also mentioned catching catfish, gold fish and frogs for eating.

6.4 Traditional Hawaiian Sites

Mr. Sam Ka‘ai said the Kolea stream was an area known for making and finding stone tools such as *poi* pounders.

Section 7 Summary and Recommendations

The lands of the study area fall in a remote and rugged section of the Ko‘olau Moku, along Maui’s eastern shore (Section 1.3). This section of East Maui is largely known for its abundant rainfall, sheer valleys, waterfalls and the traditional pond field agricultural settlement of the Ke‘anae peninsula developed in ancient times and in use today. Ke‘anae was a settlement focused in the uplands until an ancient chief ordered his subjects to gather mud from the uplands and with this mud fill in the lava of the Ke‘anae peninsula thus creating the *lo‘i* systems present today. (Section 3.1). Because of the more suitable farming and fishing grounds developed there, the lands of Ke‘anae and Wailua supported the most substantial villages in the Ko‘olau Moku. Closer in distance to the study area is the bay and land area known as Honomanu. Honomanu was said to have supported a small population in ancient time (Section 6). Conversely, the Kolea Ahupua’a is not readily mentioned in the common references related to Hawaiian traditions and mythology.

Throughout the consultation process it was discovered that the Kolea Ahupua’a was more closely tied to Kailua. This connection was developed in historic times when EMI established a base yard in Kailua and the ditch men of the early 1900’s settled there. The Tateyama family was the only family to have lived in Kolea along the Waikamoi stream.

The Tateyama family interviewed for this study were the descendants of first generation Japanese immigrant Mr. Gojiro Tateyama. Mr. Tateyama lived with his wife and eight children along the Waikamoi Stream. Here he planted fruit trees and bamboo. They eventually moved to Kailua but continued to visit lands of the study area. They fished along the coast and like individuals today, they described growing and collecting bamboo shoots, oranges, mountain apples, and *pohole* from within the CIA study area and surrounding lands. In addition to their gathering practices, they adopted several Hawaiian cultural traditions such as pounding *taro* and *ulu* for *poi* as well as preparing food in an *imu* or underground oven. They practiced their own Japanese cultural traditions of celebrating the New Year by pounding sweet *mochi* rice into round cakes. Members of this family developed an affinity and respect for nature and its resources and continue to visit the area as often as they can.

7.1 Recommendations

Based on the background research of the area and the community consultation, it is recommended that the best management practices regarding stream restoration be enforced during the decommissioning process as eventual restoration of this portion of Kolea Stream takes place. All efforts should be made to reduce silt runoff and maintain a healthy stream environment as well as maintaining healthy coastal fisheries located at the mouth of this stream. Although it is understood that the APE is the immediate location of the Kolea Reservoir, the CIA study area includes the entire Ahupua’a of Kole. It is recommended that *mauka* access be maintained within the study area to both the bamboo forest for the collection of *takenoko* (bamboo shoots) and potential gathering of other forest resources.

Finally, a sensitive approach should be taken as the decommissioning of the Kolea Reservoir proceeds with regards to the legal issues ongoing between EMI and east Maui taro farmers.

Section 8 References Cited

Abbott, I.
1992 *Laau Hawaii Traditional Hawaiian Uses of Plants*. Bishop Museum Press, Honolulu.

Bartholomew, G. a. B. B.
1994 *Maui Remembers, A Local History*. Mutual Publishing, Honolulu.

Beckwith, M.
1970 *Hawaiian Mythology*. University of Hawaii Press, Honolulu.

Department of Land and Natural Resources, S. H. P. D.
2004 Geographic Information Systems (GIS) Archaeological Site Data for Maui (Version 2004.02). Hawaii State Historic Preservation DIvision.

Griffin, A.
1987 Report on a Field Inspection of Hana Ranch Inc. Construction Site. State Historic Preservation Division, Department of Land and Natural Resources, Honolulu, HI.

Group 70 International, I., D. McGregor and C. S. Hawai*i.
1995 *Kalo Kunu O Ka ‘Āina A Cultural Landscape Study of Ke‘anae and Wailuanui, Island of Maui*.

Handy, E. S. C., E. G. Handy and M. K. Pukui
1991 *Native Planters in Old Hawaii: Their Life, Lore, and Environment*. Revised ed. Bernice P. Bishop Museum Bulletin 233. Bishop Museum Press, Honolulu,.

Haun, A. E. and D. Henry
2003 *Archaeological Inventory Survey TMK: 1-1-008:015, 023 Land of Pauwalu, Hana District, Island of Maui*.

Kamakau, S.
1992 *Ruling Chiefs of Hawaii*. Revised ed. The Kamehameha Schools Press, Honolulu, HI.

Linnekin, J.
1983 The Hui Lands of Keanae: Hawaiian Land Tenure and the Great Mahele. *Journal of the Polynesian Society* 92:169-188.

1985 *Children of the Land*. Rutgers University Press, New Brunswick.

Lucas, P. F. N. (editor)

1995 *A dictionary of Hawaiian legal land-terms*. Native Hawaiian Legal Corp. : University of Hawai°i Committee for the Preservation and Study of Hawaiian Language, Art, and Culture, Honolulu.

Author.
1926 Valley Isle May Be Proud of Officals. *Maui News* December 4. Wailuku.

Pukui, M. K., S. H. Elbert and E. K. Mookini
1974 *Place Names of Hawaii*. Rev. and enl. ed. University Press of Hawaii, Honolulu.

Sterling, E. P.
1998 *Sites of Maui*. Bishop Museum Press, Honolulu.

Stokes, J. F. G.
1917 Report on the Heiau of Maui. In *Hawaiian Alamanac and Annual for 1913 The Reference Book of Information and Statistics Relating to the Territory of Hawaii, of Value to Merchants, Tourists and Others.*, edited by T. G. Thrum, pp. 125. Thos. G. Thrum, Honolulu, HI.

Thrum, T. G.
1916 Maui’s Heiaus and Heiau Sites. In *Hawaiian Almanac and Annual for 1917*. Hawaiian Gazzette Co., Honolulu, HI.

Waihona ‘Aina
2002 Mahele Database. Waihona ‘Aina Corporation.

Youngblood, R., L. Lueras, C. Lindquist, B. Creamer and K. u. Wong
1983 *On the Hana coast : being an accounting of adventures, past and present, in a land where the hand of man seems to rest lightly*. 1st ed. The Wanderer. Published by Emphasis International Ltd. and Carl Lindquist, Honolulu, HI.

Appendix A Guidelines for Assessing Cultural Impacts from the State of Hawaii Office of Environmental Quality Control

Guidelines for Assessing Cultural Impacts

Adopted by the Environmental Council, State of Hawaii November 19, 1997

1. INTRODUCTION

It is the policy of the State of Hawaii under Chapter 343, HRS, to alert decision makers, through the environmental assessment process, about significant environmental effects which may result from the implementation of certain actions. An environmental assessment of cultural impacts gathers information about cultural practices and cultural features that may be affected by actions subject to Chapter 343, and promotes responsible decision making.

Articles IX and XII of the State Constitution, other state laws, and the courts of the state require government agencies to promote and preserve cultural beliefs, practices, and resources of native Hawaiians and other ethnic groups. Chapter 343 also requires environmental assessment of cultural resources, in determining the significance of a proposed project.

The Environmental Council encourages preparers of environmental assessments and environmental impact statements to analyze the impact of a proposed action on cultural practices and features associated with the project area. The Council provides the following methodology and content protocol as guidance for any assessment of a project that may significantly affect cultural resources.

Background

Prior to the arrival of westerners and the ideas of private land ownership, Hawaiians freely accessed and gathered resources of the land and seas to fulfill their community responsibilities. During the Mahele of 1848, large tracts of land were divided and control was given to private individuals. When King Kamehameha the III was forced to set up this new system of land ownership, he reserved the right of access to privately owned lands for Native Hawaiian ahupua’a tenants. However, with the later emergence of the western concept of land ownership, many Hawaiians were denied access to previously available traditional resources.

In 1978, the Hawaii constitution was amended to protect and preserve traditional and customary rights of Native Hawaiians. Then in 1995 the Hawaii Supreme Court confirmed that Native Hawaiians have rights to access undeveloped and under-developed private lands. Recently, state lawmakers clarified that government agencies and private developers must assess the impacts of their development on the traditional practices of Native Hawaiians as well as the cultural resources of all people of Hawaii. These Hawaii laws, and the National Historic Preservation Act, clearly mandate federal agencies in Hawaii, including the military, to evaluate the impacts of their actions on traditional practices and cultural resources.

If you own or control undeveloped or under-developed lands in Hawaii, here are some hints as to whether traditional practices are occurring or may have occurred on your lands. If there is a trail on your property, that may be an indication of traditional practices or customary usage. Other clues include streams, caves and native plants. Another important point to remember is that, although traditional practices may have been interrupted for many years, these customary practices cannot be denied in the future.

These traditional practices of Native Hawaiians were primarily for subsistence, medicinal, religious, and cultural purposes. Examples of traditional subsistence practices include fishing,

picking opihi and collecting limu or seaweed. The collection of herbs to cure the sick is an example of a traditional medicinal practice. The underlying purpose for conducting these traditional practices is to fulfill one's community responsibilities, such as feeding people or healing the sick.

As it is the responsibility of Native Hawaiians to conduct these traditional practices, government agencies and private developers also have a responsibility to follow the law and assess the impacts of their actions on traditional and cultural resources.

The State Environmental Council has prepared guidelines for assessing cultural resources and has compiled a directory of cultural consultants who can conduct such studies. The State Historic Preservation Division has drafted guidelines on how to conduct ethnographic inventory surveys. And the Office of Planning has recently completed a case study on traditional gathering rights on Kaua'i.

The most important element of preparing Cultural Impact Assessments is consulting with community groups, especially with expert and responsible cultural practioners within the ahupua’a of the project site. Conducting the appropriate documentary research should then follow the interviews with the experts. Documentary research should include analysis of mahele and land records and review of transcripts of previous ethnographic interviews. Once all the information has been collected, and verified by the community experts, the assessment can then be used to protect and preserve these valuable traditional practices.

Native Hawaiians performed these traditional and customary practices out of a sense of responsibility: to feed their families, cure the sick, nurture the land, and honor their ancestors. As stewards of this sacred land, we too have a responsibility to preserve, protect and restore these cultural resources for future generations.

TEXT OF ACT 50, SLH 2000

A BILL FOR AN ACT RELATING TO ENVIRONMENTAL IMPACT STATEMENTS

UNOFFICIAL VERSION

HOUSE OF REPRESENTATIVES H.B. NO, 2895 H.D.1

TWENTIETH LEGISLATURE, 2000

STATE OF HAWAII

A BILL FOR AN ACT

RELATING TO ENVIRONMENTAL IMPACT STATEMENTS.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF HAWAII:

SECTION 1. The legislature finds that there is a need to clarify that the preparation of environmental assessments or environmental impact statements should identify and address effects on Hawai’i’s culture, and traditional and customary rights.

The legislature also finds that native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the "aloha spirit' in Hawaii. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on government agencies a

duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.

Moreover, the past failure to require native Hawaiian cultural impact assessments has resulted in the loss and destruction of many important cultural resources and has interfered with the exercise of native Hawaiian culture. The legislature further finds that due consideration of the effects of human activities on native Hawaiian culture and the exercise thereof is necessary to ensure the continued existence, development, and exercise of native Hawaiian culture.

The purpose of this Act is to: (1) Require that environmental impact statements include the disclosure of the effects of a proposed action on the cultural practices of the community and State; and (2) Amend the definition of "significant effect" to include adverse effects on cultural practices.

SECTION 2. Section 343-2, Hawai`i Revised Statutes, is amended by amending the definitions of "environmental impact statement' or "statement" and "significant effect", to read as follows:

"'Environmental impact statement" or "statement" means an informational document prepared in compliance with the rules adopted under section 343-6 and which discloses the environmental effects of a proposed action, effects of a proposed action on the economic [and] welfare, social welfare, and cultural practices of the community and State, effects of the economic activities arising out of the proposed action, measures proposed to minimize adverse effects, and alternatives to the action and their environmental effects.

The initial statement filed for public review shall be referred to as the draft statement and shall be distinguished from the final statement which is the document that has incorporated the public's comments and the responses to those comments. The final statement is the document that shall be evaluated for acceptability by the respective accepting authority.

"Significant effect" means the sum of effects on the quality of the environment, including actions that irrevocably commit a natural resource, curtail the range of beneficial uses of the environment, are contrary to the State's environmental policies or long-term environmental goals as established by law, or adversely affect the economic [or] welfare, social welfare[.], or cultural practices of the community and State."

SECTION 3. Statutory material to be repealed is bracketed. New statutory material is underscored.

SECTION 4. This Act shall take effect upon its approval.

Approved by the Governor as Act 50 on April 26, 2000

2. CULTURAL IMPACT ASSESSMENT METHODOLOGY

Cultural impacts differ from other types of impacts assessed in environmental assessments or environmental impact statements. A cultural impact assessment includes information relating to the practices and beliefs of a particular cultural or ethnic group or groups.

Such information may be obtained through scoping, community meetings, ethnographic interviews and oral histories. Information provided by knowledgeable informants, including traditional cultural practitioners, can be applied to the analysis of cultural impacts in conjunction

with information concerning cultural practices and features obtained through consultation and from documentary research.

In scoping the cultural portion of an environmental assessment, the geographical extent of the inquiry should, in most instances, be greater than the area over which the proposed action will take place. This is to ensure that cultural practices which may not occur within the boundaries of the project area, but which may nonetheless be affected, are included in the assessment. Thus, for example, a proposed action that may not physically alter gathering practices, but may affect access to gathering areas would be included in the assessment. An ahupua'a is usually the appropriate geographical unit to begin an assessment of cultural impacts of a proposed action, particularly if it includes all of the types of cultural practices associated with the project area. In some cases, cultural practices are likely to extend beyond the ahupua'a and the geographical extent of the study area should take into account those cultural practices.

The historical period studied in a cultural impact assessment should commence with the initial presence in the area of the particular group whose cultural practices and features are being assessed. The types of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs.

The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man made and natural, including submerged cultural resources, which support such cultural practices and beliefs.

The Environmental Council recommends that preparers of assessments analyzing cultural impacts adopt the following protocol:

1. identify and consult with individuals and organizations with expertise concerning the types of cultural resources, practices and beliefs found within the broad geographical area, e.g., district or ahupua`a;

2. identify and consult with individuals and organizations with knowledge of the area potentially affected by the proposed action;

3. receive information from or conduct ethnographic interviews and oral histories with persons having knowledge of the potentially affected area;

4. conduct ethnographic, historical, anthropological, sociological, and other culturally related documentary research;

5. identify and describe the cultural resources, practices and beliefs located within the potentially affected area; and

6. assess the impact of the proposed action, alternatives to the proposed action, and mitigation measures, on the cultural resources, practices and beliefs identified.

Interviews and oral histories with knowledgeable individuals may be recorded, if consent is given, and field visits by preparers accompanied by informants are encouraged. Persons interviewed should be afforded an opportunity to review the record of the interview, and consent to publish the record should be obtained whenever possible. For example, the precise location of human burials are likely to be withheld from a cultural impact assessment, but it is important that

the document identify the impact a project would have on the burials. At times an informant may provide information only on the condition that it remain in confidence. The wishes of the informant should be respected.

Primary source materials reviewed and analyzed may include, as appropriate: Mahele, land court, census and tax records, including testimonies; vital statistics records; family histories and genealogies; previously published or recorded ethnographic interviews and oral histories; community studies, old maps and photographs; and other archival documents, including correspondence, newspaper or almanac articles, and visitor journals. Secondary source materials such as historical, sociological, and anthropological texts, manuscripts, and similar materials, published and unpublished, should also be consulted. Other materials which should be examined include prior land use proposals, decisions, and rulings which pertain to the study area.

3. CULTURAL IMPACT ASSESSMENT CONTENTS

In addition to the content requirements for environmental assessments and environmental impact statements, which are set out in HAR §§ 11-200-10 and 16 through 18, the portion of the assessment concerning cultural impacts should address, but not necessarily be limited to, the following matters:

1. A discussion of the methods applied and results of consultation with individuals and organizations identified by the preparer as being familiar with cultural practices and features associated with the project area, including any constraints or limitations which might have affected the quality of the information obtained.

2. A description of methods adopted by the preparer to identify, locate, and select the persons interviewed, including a discussion of the level of effort undertaken.

3. Ethnographic and oral history interview procedures, including the circumstances under which the interviews were conducted, and any constraints or limitations which might have affected the quality of the information obtained.

4. Biographical information concerning the individuals and organizations consulted, their particular expertise, and their historical and genealogical relationship to the project area, as well as information concerning the persons submitting information or interviewed, their particular knowledge and cultural expertise, if any, and their historical and genealogical relationship to the project area.

5. A discussion concerning historical and cultural source materials consulted, the institutions and repositories searched, and the level of effort undertaken. This discussion should include, if appropriate, the particular perspective of the authors, any opposing views, and any other relevant constraints, limitations or biases.

6. A discussion concerning the cultural resources, practices and beliefs identified, and, for resources and practices, their location within the broad geographical area in which the proposed action is located, as well as their direct or indirect significance or connection to the project site.

7. A discussion concerning the nature of the cultural practices and beliefs, and the significance of the cultural resources within the project area, affected directly or indirectly by the proposed project.

8. An explanation of confidential information that has been withheld from public disclosure in the assessment.

9. A discussion concerning any conflicting information in regard to identified cultural resources, practices and beliefs.

10. An analysis of the potential effect of any proposed physical alteration on cultural resources, practices or beliefs; the potential of the proposed action to isolate cultural resources, practices or beliefs from their setting; and the potential of the proposed action to introduce elements which may alter the setting in which cultural practices take place.

11. A bibliography of references, and attached records of interviews which were allowed to be disclosed.

The inclusion of this information will help make environmental assessments and environmental impact statements complete and meet the requirements of Chapter 343, HRS. If you have any questions, please call 586-4185.

Appendix B Formal Letter Responses

Mrs. Thelma Simoka - OHA

Colleen Dagan

From: Thelma Shimaoka [thelmas@oha.org]
Sent: Monday, April 19, 2010 2:45 PM
To: cdagan@culturalsurveys.com
Cc: Dirk Soma; John Rosa
Subject: SPAM-MED: Responding to CSH Job Code: Makaiwa 2

April 19, 2010

Aloha Colleen:

Subject: Cultural Impact Assessment Community Contact Letter for the Kolea Reservoir Decommissioning Project,

Kolea Ahupua'a Hana District, Maui Island, TMK (2) 1-1-001:050

In response to your request in seeking OHA kokua or help and guidance regarding the following aspects of your study dated 4/6 (did not receive until 4/12/10):

- General History and present and past land use of the project area.
- Knowledge of cultural resources which may be impacted by the Kolea Reservoir Decommissioning Project –for example, traditional plant gathering sites, historic sites, archaeological sites, and burials.
- Knowledge of traditional gathering practices in the area – both past and ongoing.
- Cultural associations of the project area, such as legends and traditional uses.
- Referrals of kupuna or elders who might be willing to share their cultural knowledge of the project area and the surrounding ahupua'a lands.
- Any other cultural concerns the community might have related to Hawaiian cultural practices within the Kolea Ahupua'a and/or in the vicinity of the proposed Kolea Reservoir Decommissioning Project area.

Submitted are names of persons thatmay be helpful to your project. These are families that live in the Hana area for many generations and could provide relevant information as above mentioned.

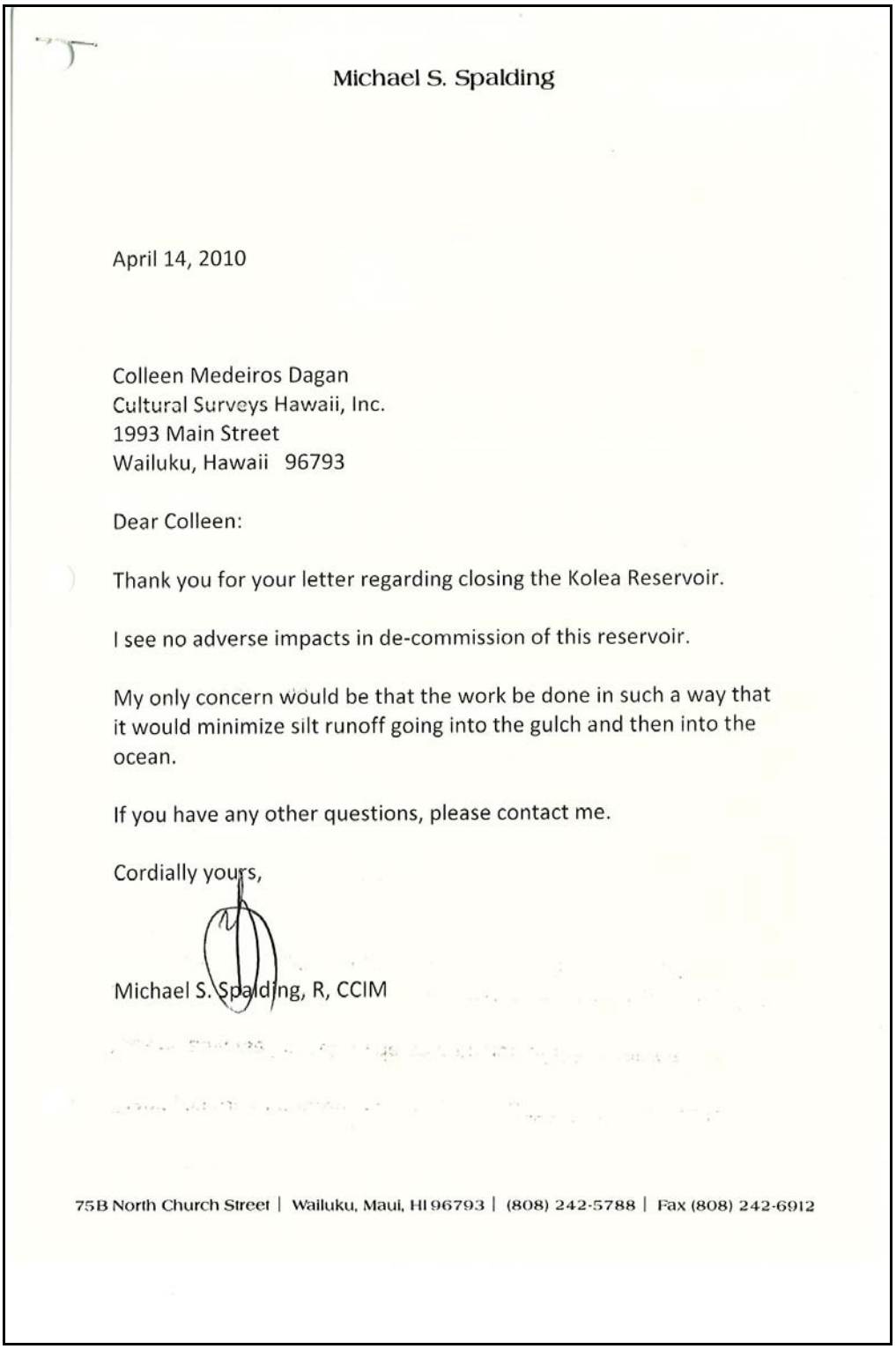
Terri Poaipuni
Hoopai Waikoloa
Makala Waring
Rose Soon
Jo Ann Carreira
Timmy Bailey

Thelma M. Shimaoka
Community Outreach Specialist 3
Maui Island
360 Papa Place, Suite 105
Kahului, HI 96732
T-808-873-3363 F-808-873-3361
Email: thelmas@oha.org

"Ua lehulehu a manomano ke 'ikena a ka Hawai'i"
"Great and numerous is the knowledge of the Hawaiians"

1

Mr. Mike Spalding



Michael S. Spalding

April 14, 2010

Colleen Medeiros Dagan
Cultural Surveys Hawaii, Inc.
1993 Main Street
Wailuku, Hawaii 96793

Dear Colleen:

Thank you for your letter regarding closing the Kolea Reservoir.

I see no adverse impacts in de-commission of this reservoir.

My only concern would be that the work be done in such a way that it would minimize silt runoff going into the gulch and then into the ocean.

If you have any other questions, please contact me.

Cordially yours,

Michael S. Spalding, R, CCIM

75B North Church Street | Wailuku, Maui, HI 96793 | (808) 242-5788 | Fax (808) 242-6912

Mrs. Phyllis "Coochie" Cayan – State Historic Preservation Division, History and Culture Branch

LINDA LINGLE
GOVERNOR OF HAWAII

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

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

April 20, 2010

Ms. Colleen Medeiros Dagan
Ms. Anna Cordova
Cultural Surveys Hawai'i
1993 Main Street
Wailuku, Hawai'i 96793

LOG NO: 2010.0109
DOC NO: 1004.HR04

Dear Colleen Dagan and Anna Cordova:

SUBJECT: Request for Information Regarding a Cultural Impact Assessment (CIA) for the Kolea Reservoir Decommissioning Project, Kolea Ahupua'a, Hāna District, Island of Maui. TMK: (2) 1-1-001:050.

This is in response to your request for any information that might assist your firm in gathering knowledge of traditional cultural practices and/or rights that might be impacted by the above project.

Water is the most precious resource and a critical part of the cultural lifestyle in the Hana District so your request is timely for this community who can best share information for your CIA purposes.

The department is referring you all to talk story with the following whom may be helpful:

1. Terry Akuna, Virgil Day, Kyle Nakanelua, Ed Wendt and other taro farmers of Keanae and Wailua — no contact info available
2. Senator Kalani English — Email: senenglish@capitol.hawaii.gov — #808.587.7225
3. House Representative Mele Carroll — Email: repcarroll@capitol.hawaii.gov — #808.586.6790
4. the Hawaiian Studies instructor at Hana School
5. the Hāna senior citizen community center

Should you have any questions or concerns, please contact our Cultural Historian, Mr. Hinano Rodrigues at 808-243-4640.

Sincerely,

Phyllis Coochie Cayan

Ms. Phyllis "Coochie" Cayan
History and Culture Branch Chief

cc: Mr. Hinano Rodrigues, SHPD Cultural Historian

Appendix C Authorization Forms

Cultural Surveys Hawai'i Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

Providing Excellence in Cultural Resource Management

O'ahu P.O. Box 1114
Kailua, HI 96734
Ph.: (808) 262-9972
Fax.: (808) 262-4950

Maui 16 S. Market St., #2N
Wailuku, HI 96793
Ph.: (808) 242-9882
Fax.: (808) 244-1994

Kaua'i P.O. Box 498
Lawai, HI 96765
Ph.: (808) 245-4883

Authorization and Release Form

Cultural Surveys Hawai‘i (CSH) is grateful for the generosity of the Kūpuna and Kama‘āina who have willingly shared their knowledge and experiences for the preparation of a cultural impact assessment for the Kolea Reservoir Decommissioning Project, East Maui.

We understand our responsibility in respecting the wishes and concerns of the interviewees participating in our assessment. Here are the procedures we promise to follow:

1. You will have the opportunity to review the written transcription of our interview with you. At that time, you may make any additions, deletions, or corrections you wish.
2. You will be given a copy of the interview transcript you have approved for your records.

For our records and yours, we humbly request your confirmation that:

1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You consent to the interview being made available to the public.

I, Robert T. Igarashi, agree to the procedures outlined above and by my
(Please print your name)
signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:

Robert T. Igarashi
(Signature)

6/29/10
(Date)

Cultural Surveys Hawai'i Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

Providing Excellence in Cultural Resource Management

O'ahu P.O. Box 1114
Kailua, HI 96734
Ph.: (808) 262-9972
Fax.: (808) 262-4950

Maui 16 S. Market St., #2N
Wailuku, HI 96793
Ph.: (808) 242-9882
Fax.: (808) 244-1994

Kaua'i P.O. Box 498
Lawai, HI 96765
Ph.: (808) 245-4883

Authorization and Release Form

Cultural Surveys Hawai‘i (CSH) is grateful for the generosity of the Kūpuna and Kama‘āina who have willingly shared their knowledge and experiences for the preparation of a cultural impact assessment for the Kolea Reservoir Decommissioning Project, East Maui.

We understand our responsibility in respecting the wishes and concerns of the interviewees participating in our assessment. Here are the procedures we promise to follow:

1. You will have the opportunity to review the written transcription of our interview with you. At that time, you may make any additions, deletions, or corrections you wish.
2. You will be given a copy of the interview transcript you have approved for your records.

For our records and yours, we humbly request your confirmation that:

1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You consent to the interview being made available to the public.

I, Jean K. Igarashi, agree to the procedures outlined above and by my
(Please print your name)
signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:

Jean K Igarashi
(Signature)

6/29/10
(Date)

Cultural Surveys Hawai'i Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

Providing Excellence in Cultural Resource Management

O'ahu P.O. Box 1114
Kailua, HI 96734
Ph.: (808) 262-9972
Fax.: (808) 262-4950

Maui 16 S. Market St., #2N
Wailuku, HI 96793
Ph.: (808) 242-9882
Fax.: (808) 244-1994

Kaua'i P.O. Box 498
Lawai, HI 96765
Ph.: (808) 245-4883

Authorization and Release Form

Cultural Surveys Hawai‘i (CSH) is grateful for the generosity of the Kūpuna and Kama‘āina who have willingly shared their knowledge and experiences for the preparation of a cultural impact assessment for the Kolea Reservoir Decommissioning Project, East Maui.

We understand our responsibility in respecting the wishes and concerns of the interviewees participating in our assessment. Here are the procedures we promise to follow:

1. You will have the opportunity to review the written transcription of our interview with you. At that time, you may make any additions, deletions, or corrections you wish.
2. You will be given a copy of the interview transcript you have approved for your records.

For our records and yours, we humbly request your confirmation that:

1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You consent to the interview being made available to the public.

I, Maureen Farineau, agree to the procedures outlined above and by my
(Please print your name)
signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications: #3 only with corrections and deleted items removed. Thank you

Maureen Farineau
(Signature)

6/28/2010
(Date)

Cultural Surveys Hawai'i Inc.
Archaeological and Cultural Impact Studies
Hallett H. Hammatt, Ph.D., President

Providing Excellence in Cultural Resource Management

O'ahu P.O. Box 1114
Kailua, HI 96734
Ph.: (808) 262-9972
Fax.: (808) 262-4950

Maui 16 S. Market St., #2N
Wailuku, HI 96793
Ph.: (808) 242-9882
Fax.: (808) 244-1994

Kaua'i P.O. Box 498
Lawai, HI 96765
Ph.: (808) 245-4883

Authorization and Release Form

Cultural Surveys Hawai‘i (CSH) is grateful for the generosity of the Kūpuna and Kama‘āina who have willingly shared their knowledge and experiences for the preparation of a cultural impact assessment for the Kolea Reservoir Decommissioning Project, East Maui.

We understand our responsibility in respecting the wishes and concerns of the interviewees participating in our assessment. Here are the procedures we promise to follow:

1. You will have the opportunity to review the written transcription of our interview with you. At that time, you may make any additions, deletions, or corrections you wish.
2. You will be given a copy of the interview transcript you have approved for your records.

For our records and yours, we humbly request your confirmation that:

1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You consent to the interview being made available to the public.

I, SHAWN K. TANAKA, agree to the procedures outlined above and by my
(Please print your name)
signature, given my consent and release for this interview to be used for historic documentation and academic purposes.
Additional Comments and Clarifications:

Shawn K. Tanaka
(Signature)

7/6/10
(Date)

Appendix D Land Commission Awards (Waihona ‘Aina Corporation 2000)

LCA 03715B Kekuahani

Claim Number:	**03715B**		
Claimant:	**Kekuahani**		
Other claimant:			
Other name:			
Island:	**Maui**		
District:	**Koolau**		
Ahupuaa:	**Haiku**		
Ili:	**Keopuka, Loiloa**		
Apana:	**3**	Awarded:	**1**
Loi:		FR:	
Plus:		NR:	
Mala Taro:		FT:	**39v15**
Kula:		NT:	
House lot:		RP:	**7518**
Kihapai/Pakanu:		Number of Royal Patents:	**1**
Salt lands:		Koele/Poalima:	**No**
Wauke:		Loko:	**No**
Olona:		Lokoia:	**No**
Noni:		Fishing Rights:	**No**
Hala:		Sea/Shore/Dunes:	**No**
Sweet Potatoes:		Auwai/Ditch:	**No**
Irish Potatoes:		Other Edifice:	**No**
Bananas:		Spring/Well:	**No**
Breadfruit:		Pigpen:	**No**
Coconut:		Road/Path:	**Yes**
Coffee:		Burial/Graveyard:	**No**
Oranges:		Wall/Fence:	**No**
Bitter Melon/Gourd:		Stream/Muliwai/River:	**No**
Sugar Cane:		Pali:	**Yes**
Tobacco:		Disease:	**No**

Koa/Kou Trees:		Claimant Died:	**No**
Other Plants:		Other Trees:	
Other Mammals:	**No**	Miscellaneous:	**government road**

No. 5250D, Kekuahani
F.T. 125v8

The claimant, sworn, that he had written the claim and have sent it to the Land Commission.

Inihia, sworn, The claimants land are of two pieces.

No. 1 is kalo and kula land in the Ahupuaa of Keopuka & Loiloa.
No. 2 is kula land in the Ahlupuaa of Keopuka & Loiloa.

The claimant received these lands from Ikoa, Konohiki for Loiloa in the year 1839. His title has never been disputed.

No. 1 is bounded:
Mauka by Aupuni
Koolau by pali of Keopuka
Makai by sea shore and Liloa
Wailuku by Keopuka Aina.

No. 2 is bounded:
Mauka and all sides by Aupuni.

N.T. 6v7
No. 3715B, Kekuahani, July 18 1849

Inihia, sworn,

Section 1 - Taro pasture in Keopuka.
Section 2 - Taro pasture in Loiloa.
Section 3 - Olona pasture in Loiloa.

Land from Ikoa in 1839.

Section 1:
Mauka by Government road
Hana by Keopuka pali
Makai by Liloa/Keopuka pali
Wailuku by Ke.

Section 2 - Surrounded by government boundaries.

[Award 3715B; R.P.7518; Loiloa Haiku Koolau; 2 ap.; .48 Ac.; See No. 5250D for F.T. document; 5250D not awarded]

LCA 03957 B Keuoho, Luka

Number: 03957B

Claim Number:	**03957B**		
Claimant:	**Keuoho, Luka**		
Other claimant:	Kenoha		
Other name:			
Island:	**Maui**		
District:	**Koolau**		
Ahupuaa:	**Makaiwa, Kolea, Moolua, Punaluu**		
Ili:	**Punaluu**		
Apana:	**5**	Awarded:	**1**
Loi:		FR:	
Plus:		NR:	
Mala Taro:		FT:	
Kula:		NT:	**439v5**
House lot:		RP:	**4109**
Kihapai/Pakanu:	2	Number of Royal Patents:	**1**
Salt lands:		Koele/Poalima:	**No**
Wauke:		Loko:	**No**
Olona:		Lokoia:	**No**
Noni:		Fishing Rights:	**No**
Hala:		Sea/Shore/Dunes:	**No**
Sweet Potatoes:		Auwai/Ditch:	**No**
Irish Potatoes:		Other Edifice:	**No**
Bananas:		Spring/Well:	**No**
Breadfruit:		Pigpen:	**No**
Coconut:		Road/Path:	**No**
Coffee:		Burial/Graveyard:	**No**
Oranges:		Wall/Fence:	**No**
Bitter Melon/Gourd:		Stream/Muliwai/River:	**No**
Sugar Cane:		Pali:	**No**
Tobacco:		Disease:	**No**
Koa/Kou Trees:		Claimant Died:	**No**
Other Plants:		Other Trees:	
Other Mammals:	**No**	Miscellaneous:	

No. 3957B, Luka or Kenoha, See K, July 2, 1849
N.T. 439v5

Kalama, sworn, He has seen Luka's land Makaiwa in Koloa of Koolau land it is an old land from Kauluha before 1819.

Section 1:
Mauka by Waonahele
Hana by Kekua's land
Makai by pali
Hamakua by Nawaihi's land.

Section 2 Kihapai in Punaluu.
Mauka by Ku
Hana and Makai by pali
Hamakua by stream.

Section 3 Kihapai in Kolea.
Mauka by Pahupu's land

Hana and Makai by pali
Hamakua by Pahupu's land.

No one has objected to him.

[Award 3957B; R.P. 4109; Kolea Koolau; 2 ap.; .91 Ac.; Makaiwa Koolau; 1 ap.; 13 Acs; Moloa Koolau; 1 ap.; .19 Ac.; Punalau Koolau; 1 ap.; .88 Ac; Punaluu Koolau; 3 ap.; 1.36 Acs]

Appendix E CSH Scoping Letter

CULTURAL SURVEYS HAWAI'I
ARCHAEOLOGICAL, CULTURAL, AND HISTORICAL DOCUMENTATION SERVICES - SINCE 1982

O'ahu Island
P.O. Box 1114
Kailua, Hawai'i 96734
Ph: (808) 262-9972
Fax: (808) 262-4950

Maui Island
1993 Main Street
Wailuku, Hawai'i 96793
Ph: (808) 242-9882
Fax: (808) 244-1994

Branch Offices:
Hilo, Hawai'i
Kona, Hawai'i
Lāwai, Kaua'i

CSH Job Code: Makaiwa 2

March 22, 2010

Subject: Cultural Impact Assessment Community Contact Letter for the Kolea Reservoir Decommissioning Project, Kolea Ahupua'a, Hāna District, Maui Island, TMK (2) 1-1-001:050

Dear Recipient:

At the request of Oceanit Laboratories, Inc., Cultural Surveys Hawai'i, Inc. (CSH) is conducting a Cultural Impact Assessment (CIA) for the proposed Kolea Reservoir Decommissioning Project, located in Kolea Ahupua'a, Hāna District, Maui Island, TMK (2) 1-1-001:050. An archaeological inventory survey of the project site is also being conducted by CSH along with the CIA. The Kolea Reservoir is located along Kolea Stream at the 800-foot contour and approximately 1.15 kilometers from the coastline (Figures 1 & 2).

The purpose of this project is to decommission the dam at Kolea Reservoir. East Maui Irrigation Co., Ltd. currently owns and operates the reservoir and associated dam that was originally built in 1901. With funding from the State of Hawai'i, the plan is to remove a portion of the existing embankment in order to make the dam non-functional. The amount of flow to Kolea Stream will remain unchanged. The area in and around the reservoir that will be affected is approximately 4 acres. For the CIA portion of this project, the entire Kolea Ahupua'a will be researched.

The purpose of the CIA is to evaluate potential impacts to traditional cultural practices as a result of the proposed project.

We are seeking your *kōkua* or help and guidance regarding the following aspects of our study:

- **General history and present and past land use of the project area.**
- **Knowledge of cultural resources which may be impacted by the Kolea Reservoir Decommissioning Project - for example, traditional plant gathering sites, historic sites, archaeological sites, and burials.**
- **Knowledge of traditional gathering practices in the area – both past and ongoing.**

WWW.CULTURALSURVEYS.COM - INFO@CULTURALSURVEYS.COM

- **Cultural associations of the project area, such as legends and traditional uses.**
- **Referrals of *kūpuna* or elders who might be willing to share their cultural knowledge of the project area and the surrounding *ahupua`a* lands.**
- **Any other cultural concerns the community might have related to Hawaiian cultural practices within the Kolea Ahupua'a and/or in the vicinity of the proposed Kolea Reservoir Decommissioning Project area.**

We invite you to contact us, Anna Cordova and/or Colleen Medeiros Dagan, at 1-808-242-9882. You may also contact us by e-mail at acordova@culturalsurveys.com and cdagan@culturalsurveys.com if you have any information you would like to share.

Mahalo,

Anna Cordova, Archaeologist
Colleen Medeiros Dagan, Archaeologist

Cultural Impact Assessment Community Contact Letter for the Kolea Reservoir Decommissioning Project, Kolea Ahupua'a, Hāna District, Maui Island, TMK (2) 1-1-001:050

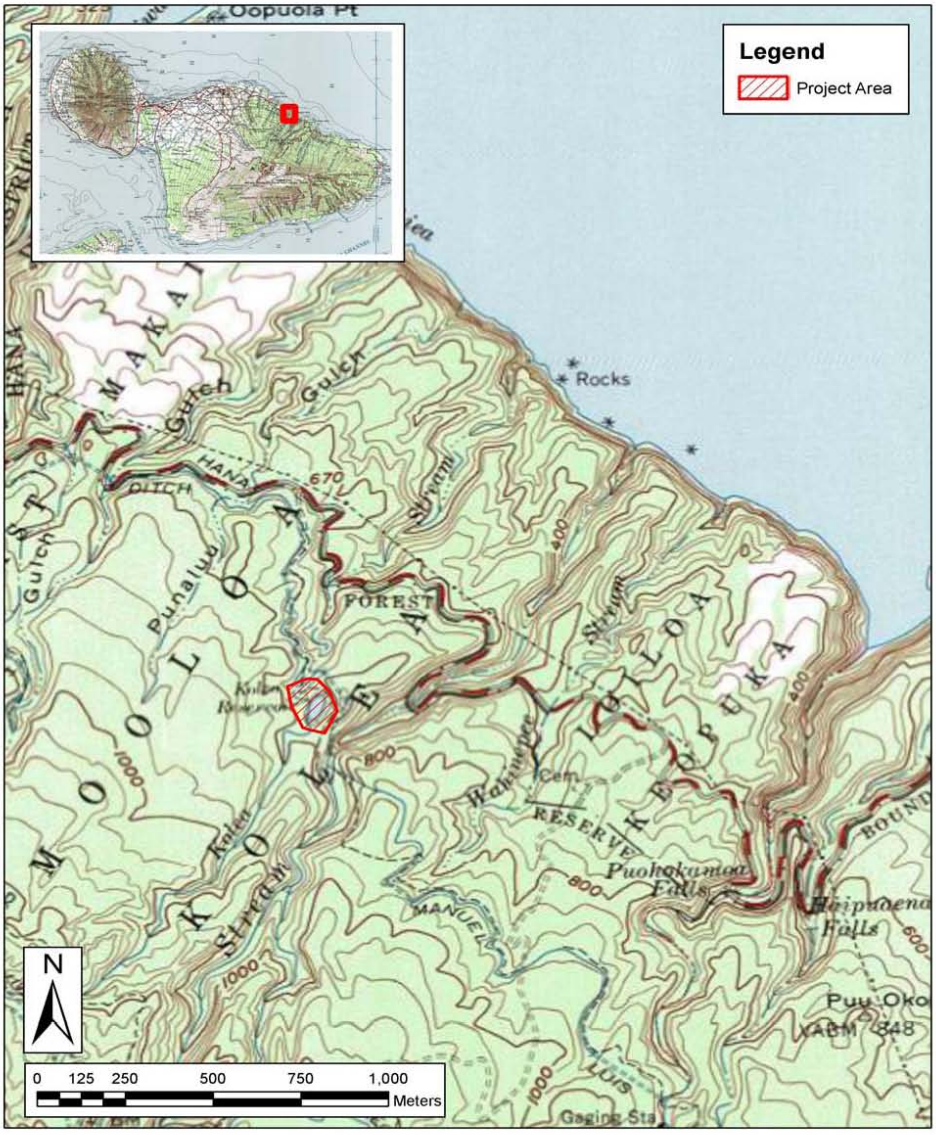


Figure 1. Topographic map with project site indicated by the red cross-hatched area

Cultural Impact Assessment Community Contact Letter for the Kolea Reservoir Decommissioning Project, Kolea Ahupua‘a, Hāna District, Maui Island, TMK (2) 1-1-001:050

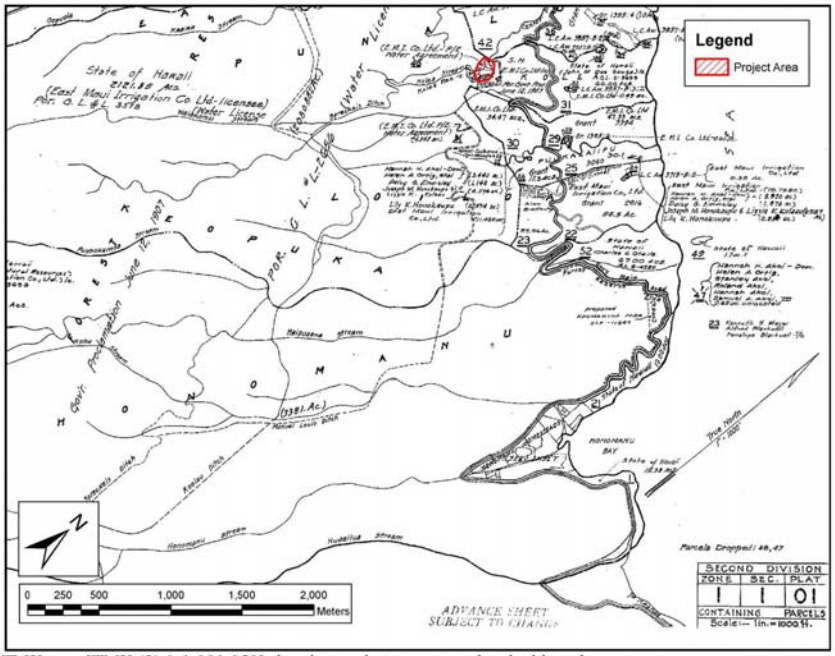


Figure 2. TMK map [TMK (2) 1-1-001:050] showing project area cross-hatched in red.

Cultural Impact Assessment Community Contact Letter for the Kolea Reservoir Decommissioning Project, Kolea Ahupua‘a, Hāna District, Maui Island, TMK (2) 1-1-001:050

APPENDIX B

State Historic Preservation Letter

July 2010

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

July 27, 2010

Hallett H. Hammatt, Ph.D.
Cultural Surveys Hawai'i, Inc.
PO Box 1114
Kailua, Hawaii 96734

LOG NO: 2010.1975
DOC NO: 1007MD27
Archaeology

Dear Dr. Hammatt:

SUBJECT: Chapter 6E-8 Historic Preservation Review –
Archaeological Inventory Survey of Four Acres with One New Site
Kolea Ahupua'a, Hāna District, Island of Maui
TMK: (2) 1-1-001:050 (por.)

This letter reviews the aforementioned report (McCurdy and Hammatt March 2010*; Archaeological Inventory Survey Report for the Kolea Reservoir Decommissioning Project, Kolea Ahupua`a, Hana District, Maui Island, TMK: [2] 1-1-001:050; CSH Job Code: MAKAIWA 1*), which we received on May 10, 2010. We apologize for the delay in our reply.

The project area of the survey encompasses the Kolea Dam, newly recorded as SIHP 50-50-13-6683, a Plantation-era reservoir that was hand-constructed in 1910. It is being decommissioned as a water storage facility at this location because it is no longer needed.

This was the first reservoir built following the annexation of Hawaii by the United States in 1898. It has been recommended significant under criteria "a" (association with a period of great change in Hawaii followed by an influx of immigrant contract labors due to the water availability for improved crop yields); "c" (for its distinctive style and hand-built construction); and "d" for information important to the understanding of water diversion techniques and structures employed during the early plantation period on Maui. We concur with these recommendations. We also agree that the next step is to begin an architectural inventory survey in consultation with our Architecture Branch.

This report is approved as final pursuant to HAR §13-276. Upon receipt of this letter please submit one paper copy of your plan marked "Final" to our Kapolei office along with a CD containing a searchable pdf version of the final report and a copy of this approval letter, marked to the attention of the "**Kapolei Library.**" If you have questions about this letter please contact Morgan Davis at (808) 896-0514 or via email to: morgan.e.davis@hawaii.gov.

Aloha,

Theresa K. Donham
Acting Archaeology Branch Chief
State Historic Preservation Division

APPENDIX C

Architectural Survey

ARCHITECTURAL INVENTORY SURVEY (AIS) CHECKLIST

1. **HISTORIC NAME OF PROPERTY:** Kolea Reservoir

2. **LOCATION/ADDRESS:** vicinity of Hana, Maui
3. **TMK NUMBER:** (2) 1-1-001:050 (portion)

4. **PROPERTY OWNER:** State of Hawaii (fee owner), A&B Properties/ East Maui Irrigation [EMI] Co Ltd (lessee)

5. **APPLICABLE NATIONAL REGISTER CRITERIA (check one or more qualifying criteria):**

☑ **Criterion A**-- Property is associated with events that have made a significant contribution to the broad patterns of our history.

Criterion B—Property is associated with the lives of persons significant in our past.

☑ **Criterion C**—Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

Criterion D—Property has yielded or is likely to yield, information important in prehistory or history.

or Criteria Considerations: (circle one or more) A B C D E F G

6. **INTEGRITY: Does the property retain its historic integrity? Check applicable aspects of integrity retained.**

☑ **Location** ☑ **Design** ☑ **Setting** ☑ **Materials** ☑ **Workmanship** ☑ **Feeling** ☑ **Association**

7. **NR ELIGIBILITY: Is the property eligible for listing on the National Register of Historic Places?**

Yes ☑ **No** ☐ **If "No", then why?** _____

8. **MASON ARCHITECTS, INC. PROPOSED RECOMMENDATIONS/MITIGATION MEASURES:**

File a copy of the Architectural Inventory Survey of March 2010 with the Hawaii State Historic Preservation Division.

ARCHITECTURAL INVENTORY SURVEY REPORT

to determine the significance of a property potentially eligible for nomination to the National Register of Historic Places

SHPD Doc Number: _____
TMK: (2) 1-1-001:050 (portion of)

1. Name of Property

Historic name Kolea Reservoir

Other names/site number _____

2. Location

Street & Number Located on Kolea Stream about 1/3 mile mauka of Highway 360 ☐ not for publication
in Kolea ahupuaa, Maui

City or Town Hana X vicinity

State Hawai'i **Code** HI **County** Maui **Code** 009 **Zip code** 96713

3. Property Owner

Name State of Hawaii (Fee Owner) A & B Properties/ East Maui Irrigation [EMI] Co., Ltd. (Lessee)

Street & Number (EMI) P.O. Box 791628 **Telephone** (808) 579-9516

City or Town Paia **State** Hawaii **Zip code** 96779

4. Geographical Data

Acreage of Property The Kolea Reservoir, dam, and spillway occupy about 2.3 acres within the total 2121.85 acres of TMK (2)1-1-001:050.

Verbal Boundary Description (describe the boundaries of the property)

UTM references (NAD 83) to enclose the 2.3 acres, beginning from the northeasterly point and continuing clockwise are:

1	04.792450.2310590	3	04.792350.2310490	5	04.792340.2310580	7	04.792420.2310640
2	04.792400.2310470	4	04.792370.2310560	6	04.792350.2310680		

This inventory includes all the lands within the above UTM points for the reservoir, dam, spillway and associated features.

Boundary Justification (explain why the boundaries were selected)

This is the property associated with the Kolea Reservoir since its construction in 1901.

5. Form Prepared By

Name/Title Dee Ruzicka, Architectural Historian

Organization Mason Architects, Inc. **Date** February 26, 2010

Street & Number 119 Merchant St., #501 **Telephone** 808-536-0556

City or Town Honolulu **State** Hawai'i **Zip Code** 96813

E-mail dr@masonarch.com

6. Classification

Ownership of Property
(Check as many boxes as apply)

X	private
	public - Local
X	public - State
	public - Federal

Category of Property
(Check only **one** box)

	building(s)
	district
	site
X	structure
	object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
----	----	buildings
----	----	sites
----	----	structures
----	----	objects
----	----	**Total**

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing)

n/a

Number of contributing resources previously listed in the National Register

None

7. Function or Use

Historic Functions
(Enter categories from instructions)

agriculture/ irrigation facility

Current Functions
(Enter categories from instructions)

agriculture/ irrigation facility

8. Description

Architectural Classification
(Enter categories from instructions)

other – reservoir w/ earth dam & spillway

Materials
(Enter categories from instructions)

Foundation: earth
Walls: n/a
Roof: n/a
Other:

Narrative Description and Integrity Assessment

(Describe the historic and current physical appearance of the property. Explain contributing and noncontributing resources if necessary. Begin with **a summary paragraph** that briefly describes the reason this report was requested and the general characteristics of the property, such as its location, setting, size, and significant features.)

Summary Paragraph

The March 14, 2006 failure of the Kaloko dam on Kauai raised concerns in Hawaii about the safety of its numerous earth embankment dams, most of which date from the plantation era. In April 2006 the U.S. Army Corps of Engineers undertook an

emergency safety inspection of the dam at Kolea Reservoir to determine if the dam and reservoir were "suspect for immediate concern to the downstream area under the prolonged conditions of heavy rain showers."[1] Although this inspection found that there was no immediate threat to the safety of the dam, it was later determined that because the reservoir has little current economic value, its abandonment would be the best course of action.

It is proposed by the (property owner) State of Hawaii and (lessee) East Maui Irrigation Co. Ltd., to decommission the Kolea Reservoir by removing most of the earth embankment dam, the catwalk, and the outlet works. The spillway would likely remain intact. To mitigate any effects the proposed removal of the Kolea Reservoir's dam will have upon this historic property, the present inventory survey was undertaken and documentation prepared. The following description derives from a visit to the site on February 23, 2010. The reservoir lies within the boundaries of the Koolau Forest Reserve.

Narrative Description

The waters of the Kolea Reservoir are retained by an earthen embankment dam which impounds the Kolea Stream. Other features associated with the reservoir and dam are a primary outlet valve, a catwalk from the embankment to access the primary outlet valve, a secondary outlet valve, a spillway, and a diversion structure below the dam that supplies the Center Ditch with water from the reservoir. The earth embankment dam is about 200' long and 48' high with a 35' wide crest carrying an unsurfaced roadway. At least a portion of the dam is faced with rubble boulders on its upstream slope. The long axis of the dam is oriented north northeast to south southwest with the waters of the reservoir to the east and south. The reservoir basin is about 475' long and 150' across at its widest point. On the site visit for this report the reservoir was almost completely drained, with a pool of water about 90' wide and an indicated 23'-6" depth at the primary outlet catwalk.

The inlet to the reservoir is the natural course of Kolea Stream, feeding the reservoir at its southwest end. The inlet stream courses over natural boulders in the stream bed, but as it enters the reservoir, the mud bottom of the reservoir encroaches over the boulders as the reservoir widens. The minimal flow into the reservoir from Kolea Stream seems to match the flow out of the reservoir through the outlet valve(s). At the time of the field visit, the water level in the reservoir appeared to have been unchanged for at least several days. Survey marking tape was present in the reservoir basin, at the water line and at various points around the site. The mud lining of the reservoir was somewhat moist, either from recent rain or from a recent draining of the reservoir contents.

The earth embankment dam at Kolea Reservoir has at least a section of its upstream slope faced with stacked rip rap boulders. This section of visible rip rap is flanked by areas of silt and mud which have either accumulated on top of the rip rap facing or else form the slope where no rip rap has been applied. The actual composition of the upstream slope beneath the silt and mud flanking the rip rap was not possible to ascertain during the field work. This visible rip rap section is in the form of a "v" centered just south of the primary oulet catwalk. The lower portion of the v-shape is about 10' wide at the water level and widens to about 100' at the top of the dam embankment.

At the south end of this visible rip rap section is the south abutment of the dam. Here an area of natural rock projects slightly into the bowl of the reservoir, and just south of this is the spillway for the reservoir. The spillway is a channel cut into the rock. The floor of the spillway channel is about 10' below the top of the dam embankment. The channel is about 20' wide at its inlet. When the water level is at the level of the spillway, the reservoir contains between 31 and 34 acre/ feet of water.[2] A section of the north side wall of the spillway extending about 35' from the inlet is lined with stacked boulders. The spillway channel extends west, gradually narrowing and flowing into a natural narrow gully in the rock about 130' from the spillway inlet. This gully is about 5' to 7' wide and drops sharply before widening onto more gently sloping rock ledge that turns northward and joins the flow from the outlet valves before running over a bouldered stream bed to the diversion structure for the Center Ditch.

The primary outlet valve handwheel is accessed by a wood catwalk from the top of the dam embankment above the north portion of the rip rap sectionof the upstream slope. This catwalk is formed of two vertical wood poles supporting two 36' long horizontal poles that extend out from the top of the dam. The vertical wood poles of the catwalk are braced with horizontal boards placed about every 5'. The horizontal poles taper from 14" in diameter at their bases and are spaced about 5' apart. Transverse 4" x 4" timbers span the horizontal poles and support the metal grate catwalk deck. 4" x 4" balusters and 2" x 4" rails make up the handrails at the sides of the catwalk. The handwheel for the primary outlet valve is at the end of the catwalk. It is about 2' in diameter and fixed to the top of the vertically oriented valve shaft. The valve shaft extends down to the outlet valve below the surface of the water. Along the visible length of the shaft (above where it

[1] U.S. Army Corps of Engineers, "Limited Visual Dam Safety Inspection Summary Report MA-097, Kolea Reservoir Maui, Hawaii," State of Hawaii, DLNR, 2006, 1.
[2] Ibid., "Field Inspection Sheets 1 of 10"

dissappears below the water) it is braced at three points by horizontal boards supported by knee braces which form support structures. The lowermost of these three braces is just below the present surface of the water.

The remains of staff gauge numerals at 1' increments are found on the north vertical wood pole. The highest numeral, 43, corresponds to a point level with the uppermost support structure for the vertical shaft of the outlet valve. This is at a point about 7' below the catwalk deck. At the time of the field survey the catwalk deck was about 27' above the surface of the water. The water level was between 23' and 24' on the staff gauge.

The handwheel for the secondary outlet valve is located on the upslope face of the dam, about 10' north of the catwalk, just a few feet below the crest in a small level area. This handwheel is 20" in diameter, fixed to the top of a vertical 3" diameter shaft that extends down below the earth of the dam in a 4½" diameter metal sleeve that is set in a 20" square concrete slab.

The observable portion of the Kolea Reservoir outlet works consists of an approximately 36" diameter corrugated metal culvert extending into the earth toe of the dam on the downstream side embankment opposite the two inlet valves. A small amount of water was flowing out from the outlet culvert pipe into a narrow rock-strewn channel that conveys it a short distance to the Kolea Stream bed. The downslope embankment of the dam could not be observed during the fieldwork due to the thick vegetation on its surface.

Downstream from the reservoir the outlet flow and the spillway bed converge about 80' from the center of the dam. This flow then encounters a diversion structure which feeds the water into the Center Ditch and also has the capacity to divert water downstream into the Kolea Stream bed. This diversion structure is constructed of cast concrete and uncoursed rubble with concrete mortar joints. It consists of a mixing pool (about 15' x 25') which receives incoming water from the Center Ditch and the flow from the Kolea Reservoir outlet. This pool has walls lined of uncoursed rubble with concrete mortar joints and has a natural bottom of variable depth which slopes gradually from the upstream end to about 6' deep at its downstream end. The downstream end of the pool is defined by a wide rubble and concrete mortar wall (dam) across the streambed, with a level top surface paved with uncoursed rubble and a battered downstream slope. This wide rubble wall (dam) separates the mixing pool from the Kolea Stream bed below it. The outlet through this wall (dam) which, when open allows water to flow out of the pool into the Kolea Stream bed, is a rectangular opening about 2'-6" wide and 4' high on the downslope side of the wall (dam). The outlet flow through this wall (dam) is controlled by a vertically sliding gate valve that is submerged in the mixing pool. This valve is operated by a hand lever set on a small cast concrete support structure built on the top surface of the wide wall (dam).

The inflow from Center Ditch enters the mixing pool from the east. The west side of the pool is defined by a rubble and concrete mortar wall, about 4' wide and 4' high that extends south about 30' from the wall (dam) at the downstream end of the mixing pool. This 4' wide wall separates the mixing pool (on its eastern side) from the continuation of the Center Ditch, on its western side. At the south end of this 4' wide wall a narrow concrete wall (about 10" wide) extends further south onto the bed of Kolea Stream as it flows down from the reservoir. At the bottom of this concrete wall, where the sloping bottom of the mixing pool has a shallow depth of about 1'-6", there are two 12" diameter pipes which allow water to flow out of the mixing pool. The water flowing through these pipes passes out of the mixing pool, through the 10" wide wall, and into the continuation of Center Ditch which flows northward separated from the mixing pool by the 4' wide rubble wall. After the water flows about 35' there is a small weir in Center Ditch to maintain a head of water at the two 12" diameter through-pipes and in the mixing pool. At this weir the Center Ditch is formed of cast concrete sides and bottom. A seepage of water from a source on the west side of the mixing pool is carried by a cast concrete chute over the continuation of the Center Ditch and the 4' wide wall into the mixing pool. The open-top chute is about 2'-6" high and 3' wide with walls about 4" thick.

Assessment of Integrity
(Indicate whether the property has historic integrity in terms of location, setting, design, materials, workmanship, feeling, and association)

The location of the Kolea Reservoir and associated features is original and it has not been moved. The location of the reservoir relates to the topography of the basin and its suitability for use as a reservoir. The location also seems to relate closely to the Center Ditch, extant at the time of the reservoir's construction, which received the outlet flow and transferred it to the Lowrie Ditch and hence to cane fields further west. Integrity of location has been retained.

The setting of the reservoir remains much as it was when it was constructed; the character of the environment remains as it was when the reservoir played its historical role. The surrounding area is still forested and the reservoir is located the same distance above the main road. The access road up to the reservoir has likely been widened during the years since its construction, but its character has not been changed. Integrity of setting has been retained.

The design of the reservoir and its associated features is original. The dam's slopes and earth and riprap construction as well as the spillway cut into the rock are indicative of design choices made during the planning and construction of the reservoir. Also the diversion structiure at the Center Ditch shows strong evidence of the design used to incorporate the reservoir water into the irrigation system. Integrity of design has been retained.

The key materials of the reservoir, dam, and associated features all date from the period of significance. The earth and stone features of dam, spillway, and diversion structure are original. Some metal portions of the diversion structure outlet valve have been replaced. Although the wood catwalk of the primary outlet valve at the reservoir is not original, it appears historic. Integrity of materials is largely retained.

The workmanship of the Kolea Reservoir and its primary associated features is historic. The earth and rip rap of the dam and the carved spillway display the construction methods at the time it was built. Likewise, the stone and concrete work of the diversion structure supplies vivid evidence of the labor and skill involved. Some items such as the wood catwalk express later, although still probably historic, techniques. Integrity of workmanship is largely retained.

The aspect of feeling invoked by the Kolea Reservoir has the capacity to express the sense of its historic period. Although it is currently drained, the physical qualities of the reservoir and associated features properly convey its historic character. Integrity of feeling is retained.

The aspect of association is evident in the Kolea Reservoir because it is a site important to the irrigation history of sugar cane on Maui and it is sufficiently intact to convey that relationship to an observer. Integrity of association is retained.

In summary, the Kolea Reservoir still retains integrity of location, setting, design, feeling, and association. Integrity aspects of materials and workmanship are decreased. However, all aspects of integrity are still present in amounts ample for the property to retain the identity for which it is significant and to allow listing in the National Register.

9. Statement of Significance

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing)

- [X] A Property is associated with events that have made a significant contribution to the broad patterns of our history.
- [ ] B Property is associated with the lives of persons significant in our past.
- [X] C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- [ ] D Property has yielded, or is likely to yield, information important in prehistory or history.

Areas of Significance
(Enter categories from NR instructions)

agriculture
engineering

Period of Significance

1901 – 1960

Significant Dates

1901

Criteria Considerations
(Mark "x" in all the boxes that apply)

Property is:

- [ ] A owned by a religious institution or used for religious purposes.
- [ ] B removed from its original location.
- [ ] C a birthplace or grave.
- [ ] D a cemetery.
- [ ] E a reconstructed building, object, or structure.
- [ ] F a commemorative property.
- [ ] G less than 50 years old or achieving significance within the past 50 years.

Significant Person
(Complete only if Criterion B is marked above)

Cultural Affiliation

Architect/Builder

unknown

Period of Significance (justification)

The period of significance begins with the 1901 construction of the dam and reservoir. Their contribution to the irrigation of Maui's sugarcane fields continued through the 20th century. By the 1920s EMI was diverting an average of 160 mgd (million gallons/ day) and was capable of 445 mgd. During the era of sugarcane production on Maui, EMI controlled the water rights to a large portion of the East Maui watershed. A large number of Hawaii's extant earth fill dams were built by the plantations before 1940. The period of significance closes at 1960. The Kolea Reservoir is not considered to possess the exceptional importance required under Criterion Consideration G for properties that have achieved significance within the past 50 years.

Statement of Significance Summary Paragraph (provide a summary paragraph that includes level of signficance—local, state, or national, and applicable criteria)

The Kolea Reservoir has state and local significance under National Register Criterion A for its association with the development of the sugar industry in Hawaii and on Maui.

The Kolea Reservoir is also significant under National Register Criterion C as a good example of a small earth fill dam and reservoir constructed in Hawaii during the late 19th century and early 20th century.

Narrative Statement of Significance

Criterion A:
Because sugar cane needs a large amount of water throughout its entire two year growing cycle, the development of the sugar industry on Maui was tied to the construction of ditches and reservoirs to route and collect water from the wet upland areas and deliver it to the cultivated lands on the lower arid plains. Throughout the Hawaiian Islands, plantation owners built ditch and reservoir systems to irrigate cane fields and also provide water for fluming cut cane out of the fields, washing and processing sugar, hydroelectric power, and occasionally for domestic use. As rain was the source of water for the ditches, fluctuations in the supply of water in the ditches were frequent. The reservoirs helped to ameliorate this by stockpiling water during wet times so that it could be released into the ditch when needed. Hawaiian annexation continued the sugar reciprocity policy between Hawaii and the U.S. Sugar reciprocity was dependant upon the Hawaiian government's support of the industry, including water development to boost production. A key component of water development for the sugar industry was the apportionment of water rights, including permission for the plantations to transport water out of the watershed onto the cane fields.[3]

Hawaii had an extensively developed irrigation system during the first half of the 20th cenntury. "By 1920 the sugar industry had invested $11 million in the development of surface water"[4] and was diverting an average of 800 million gallons per day. Fifty-five percent of the 250,000 acre sugar crop was irrigated. In 1934, lands planted in sugar cane in Hawaii had been invested at the rate of $304 per acre to cover both surface and ground water irrigation. This was over three times the investment per cultivated acre for the next highest capitalized state ($99/ acre, Arizona) in 1940.

The 1901[5] Kolea Reservoir was constructed by the Hamakua Ditch Company, a firm that was begun in 1876 by Alexander & Baldwin (A&B) founders Samuel Alexander and Henry Baldwin. In 1908 the Hamakua Ditch Company was succeeded by the East Maui Irrigation Company (EMI), which was formed to manage and develop surface water for all A&B sugar plantations. Hamakua Ditch Co. (EMI) was the first private water company established in Hawaii. Water companies became an important vehicle for the plantations to secure water use, negotiate with competing water interests, consolidate the management of ditch systems, and also to attract investment. Virtually all surface water collection systems in Hawaii were developed by private water companies or plantations.[6] Althought ground water from wells was available in many sugar cane growing areas, the cost of fuel for the pumps in the early days of sugar cultivation made it uneconomical. Dropping fuel prices and plantations developing their own power supplies lowered the cost of pumped water, but the development of surface water accounted for much of the cane grown in the early days of the plantations.

The Kolea Reservoir was built to augment the second large ditch irrigation project undertaken on Maui by Hamakua Ditch Co., the Lowrie Ditch.

Early A&B Irrigation Ditch Systems in East Maui
The Hamakua Ditch Company's first large ditch irrigation project, the Hamakua Ditch, was completed in 1878. This ditch (not to be confused with 1904-1910 Upper and Lower Hamakua Ditches on the Big Island) brought water from upland Hamakua, Maui to reservoirs above the sugar cane fields north of Kihei. The second large ditch irrigation project for the Hamakua Ditch Co. was the Lowrie Ditch. This was implemented to carry water that was collected from areas down slope of the earlier Hamakua Ditch. When it was finished in September 1900, the Lowrie Ditch extended 22 miles from Papaaea west and south to a reservoir about 3 miles northeast of Kihei.

---

[3] Wilcox,Carol, *Sugar Water, Hawaii's Plantation Ditches*, (Honolulu: University of Hawaii Press), 1996, 16.
[4] Wilcox, *Sugar Water*, 20
[5] Hawaii Dept. of Land and Natural Resources, Water and Land Development Division, "Dams Within the Jurisdiction of the State of Hawaii, Circular C122, 1992, 143.
[6] Wilcox, *Sugar Water*, 18.

The Kolea Reservoir and the Center Ditch System

When the Kolea Reservoir was built it contributed to the Lowrie Ditch by augmenting the flow the ditch carried to the sugar cane fields. By impounding the waters of the Kolea Stream during rainy times the reservoir was able to maintain a supply of water flowing into the Lowrie Ditch during the dryier periods. Just below the Kolea Reservior dam, a diversion bled water into the Center Ditch, a short ditch extending about 1 ½ miles that carried Kolea Reservoir water into the Lowrie Ditch at a point just below the Papaea Reservoir. Also contributing to the flow of the Center Ditch was the Manuel Luis Ditch which collected water from the Punalua Stream about 1 ½ miles east of the Kolea Reservoir and fed it into the Center Ditch just below the Kolea Reservoir. This gave the Lowrie Ditch two sources, the Papaaea Reservoir and the Center Ditch/ Kolea Reservoir/ Manuel Luis Ditch system. Although the combined length of these two ditches (Center Ditch and Manuel Luis Ditch) was about 2 ½ miles, because of the contours of the terrain they were forced to follow, their useable length was about double that distance.

After the Kolea Reservoir was built, EMI added numerous other ditches to its complex water management system, which enabled the further expansion of sugar cane production. Although EMI also developed water collection tunnels which tapped the water in aquifers, the main source of water was surface runoff (streams) like that impounded by the Kolea Reservoir. EMI eventually controlled the surface watershed of 56,000 acres in east Maui, owning 18,000 acres and leasing the rest from the state.[7] By the 1990s the Lowrie/ Center/ Manuel Luis Ditch system, with water contributed by the Kolea Reservoir, was one of four parallel levels of ditches operated by EMI which extended across the north slope of the East Maui Mountains. Of the four, the Lowrie and the Wailoa systems flow at all times, with the New Hamakua and New Haiku systems operating to take on any surplus or for times when the fields need extra delivery.[8] By this time the state leases to watershed rights that EMI previously held had expired and the company operated using year-to-year revocable permits issued by the state.[9]

Criterion C:

The Kolea Reservoir is significant as a good example of a small earth fill dam-impounded reservoir constructed in Hawaii during the late 19th century and very early 20th century, before established engineering practices began to dictate the designs of earth fill dams. Built to contain stream water for sugar cane irrigation and other plantation purposes, the reservoir is typical of its period in its use of materials, method of construction, craftsmanship, and design.

The dam itself is a good example of a small earth fill dam in Hawaii, the most common type of dam in Hawaii and accounting for more than 95% of dams in Hawaii. In Maui County there were 35 earth fill dams built by 1927. The earliest dated from 1885, with most (13) constructed during 1917.[10] One of their principal advantages is that their construction utilizes natural earth which can have great cost advantages over the extensive use of manufactured materials,. The foundation requirements for earth fill dams are also less strict than for concrete dams. The Kolea Reservoir dates from the period when earth fill dams were built using empirical methods without relying on scientific engineering principles. In 1899, just before the Kolea Reservoir dam was built, an important treatise on dam engineering, Edward Wegmann's *Design and Construction of Dams*, was first published. By 1907 additional early engineering studies suggested that the slopes of earth filled dams be determined by the application of engineering principles rather than the previous trial and error methods.[11]

The Kolea Reservoir dam has major deviations from dam design parameters that were understood but still to be recognized by vernacular dam builders at the turn of the 20th century. Its upstream slope of 1:1[12] and crest width of 35' is in contradiction to Wegmann's contemporary recommendations of upstream embankment slopes of 2:1 to 3:1(horizontal:vertical) with a maximum width of 30 feet if the top of the dam is to be used for a roadway.[13]

Earth fill dams are typically most vulnerable to destruction by overtopping during times of heavy rain due to inadequete spillway capacity. They must also be protected from erosion by spillway outlets placed too near their toe.

[7] Wilcox, *Sugar Water*, 118.
[8] Wilcox, *Sugar Water*, 121.
[9] Ibid.
[10] Hawaii DLNR, Dams Within Jurisdiction of the State of Hawaii.
[11] Arthur, H.G., "Earthfill Dams," in U.S. Dept. of the Interior, Bureau of Reclamation, *Design of Small Dams*, (Washington D.C.: Government Printing Office), 1977, 205.
[12] U.S. Army Corps of Engineers, "Limited Visual Dam Safety," 4, 5.
[13] Wegmann, Edward, *Design and Construction of Dams*, (New York: John Wiley & Sons), 1918, 223.

10. Major Bibliographical References

Bibliography (Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets)

Arthur, H.G., "Earthfill Dams," in U.S. Dept. of the Interior, Bureau of Reclamation, *Design of Small Dams*, (Washington D.C.: Government Printing Office), 1977.

Godbey, Robert Carson, *Report of the Independent Civil Investigation of the March 14, 2006 Breach of Ka Loko Dam*, Honolulu: State Department of the Attorney General, January 2007.

Hirata, Ernest K. & Associates, *Report R88: Guidelines for the Design and Construction of Small Embankment Dams*, Honolulu: Department of Land and Natural Resources, June 1992.

Schuyler, James Dix, *Recent Developments in Hydraulic Dam Construction*, New York: John Wiley & Sons, 1907.

Schuyler, James Dix, *Reservoirs for Irrigation, Water-Power and Domestic Water Supply*, (New York: John Wiley & Sons, 1909.)

Smith, Norman, *A History of Dams*, Secaucus, N.J.: Citadel Press, 1972.

State of Hawaii, Department of Land and Natural Resources, *Circular C122: DAMS Within the Jurisdiction of the State of Hawaii*, Honolulu: DLNR, April 1992.

United States Department of the Interior, Bureau of Reclamation, *Design of Small Dams*, Washington D.C., United States Printing Office, 1977.

Wegmann, Edward, *Design and Construction of Dams*, New York: John Wiley & Sons. 1918.

Wiltshire, Richard Lyman. "100 Years of Embankment Dam Design and Construction in the U.S. Bureau of Reclamation," paper presented at Bureau of Reclamation History Symposium, Las Vegas, Nevada, June 18-19, 2002 <www.usbr.gov/history/Symposium_June2002/Reclamation%20(D)/PDF'S/Wiltshire,%20Richard%20L.pdf>

U.S. Army Corps of Engineers and State of Hawaii Department of Land and Natural Resources, *Limited Visual Dam Safety Inspection Summary Report, MA-097, Kolea Reservoir, Maui, Hawaii*, Honolulu: U.S. Army Corps of Engineers and State Department of Land and Natural Resources, May, 2006.

Previous documentation on file (NPS):

____preliminary determination of individual listing (36 CFR 67 has been requested
____previously listed in the National Register
____previously determined eligible by the National Register
____designated a National Historic Landmark
____recorded by Historic American Buildings Survey #_____
____recorded by Historic American Engineering Record #_____

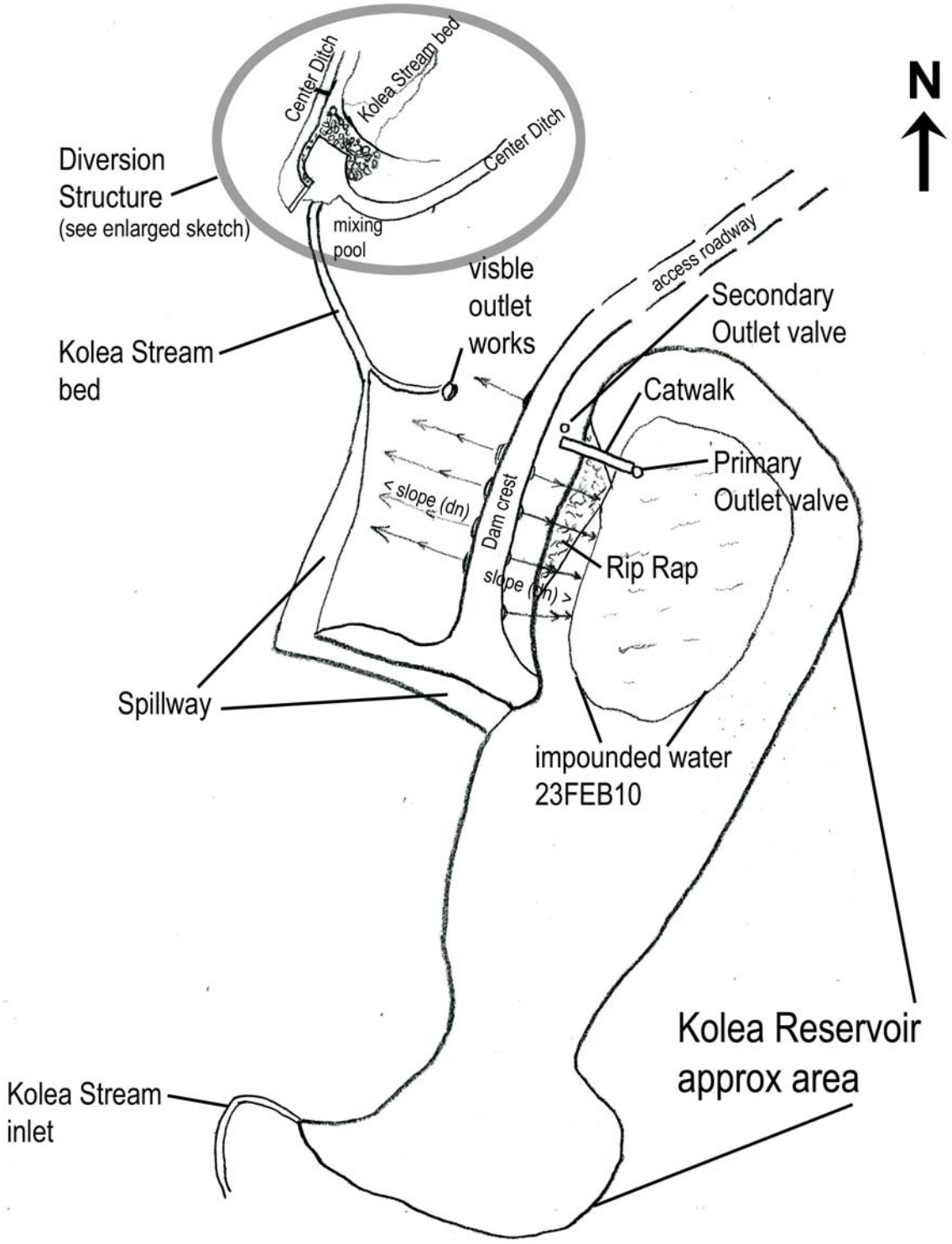
Primary location of additional data:

____State Historic Preservation Office
____Other State agency
____Federal agency
____Local government
____University
____Other
Name of repository: _____

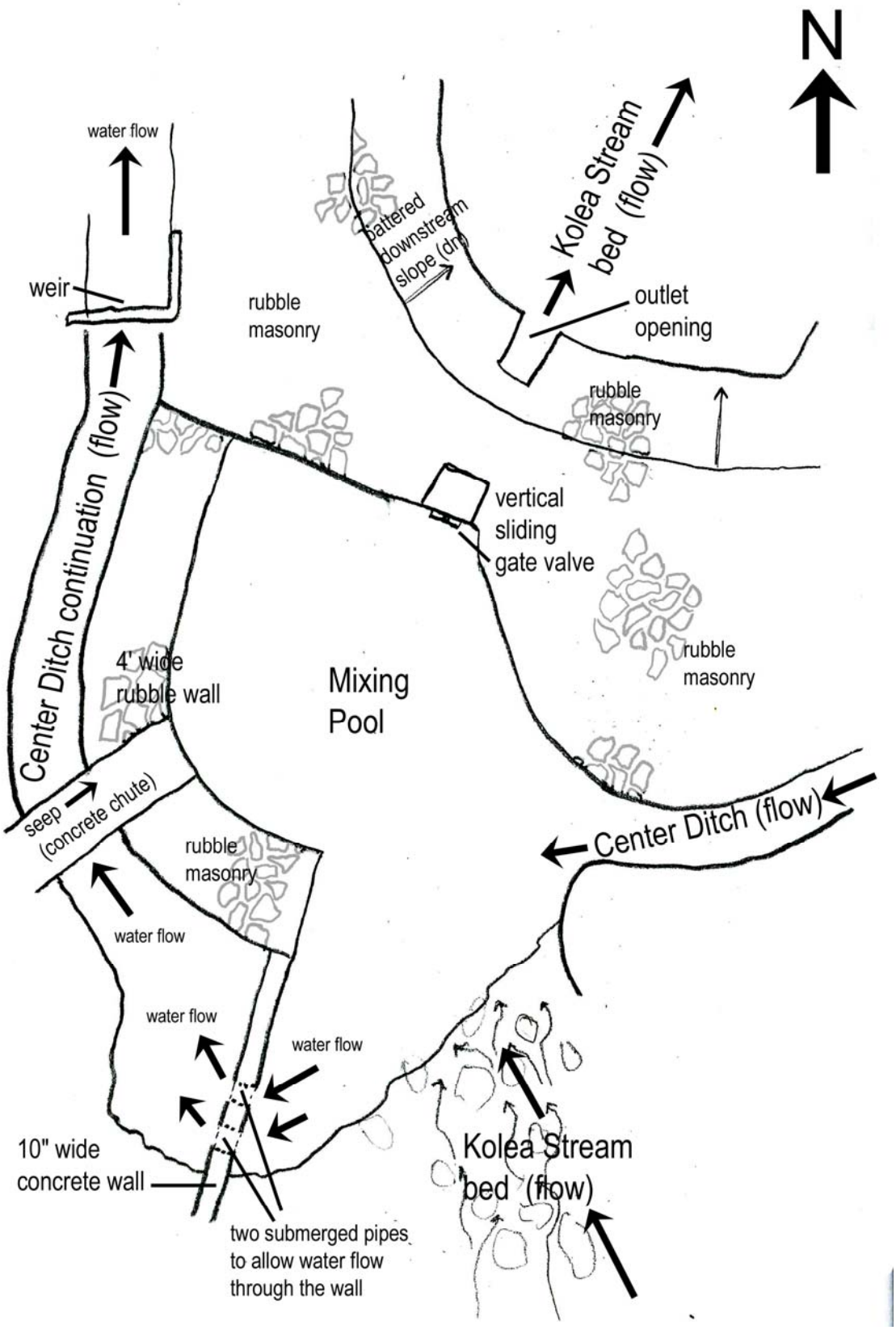
Historic Resources Survey Number (if assigned): _____

11. Photographs and Sketch Map

Sketch map showing the features of the Kolea Reservoir. Not to scale.



Enlarged sketch map of diversion structure below Kolea Reservoir. Not to scale.



Name of Property: Kolea Reservoir
City or Vicinity: Hana, Maui
County: Maui **State:** Hawaii
Photographer: Dee Ruzicka, Mason Architects, Inc.
Photographed: February 23, 2010. See the photo key map (following the photos) for photo locations & orientation.

Photograph 1. HI_ Maui County_Kolea Reservoir_1. View of the catwalk and the impounded water in Kolea Reservoir. View facing south.

Photograph 2. HI_ Maui County_Kolea Reservoir_2. Catwalk and upstream slope of the dam showiing the rip rap section. View facing north.

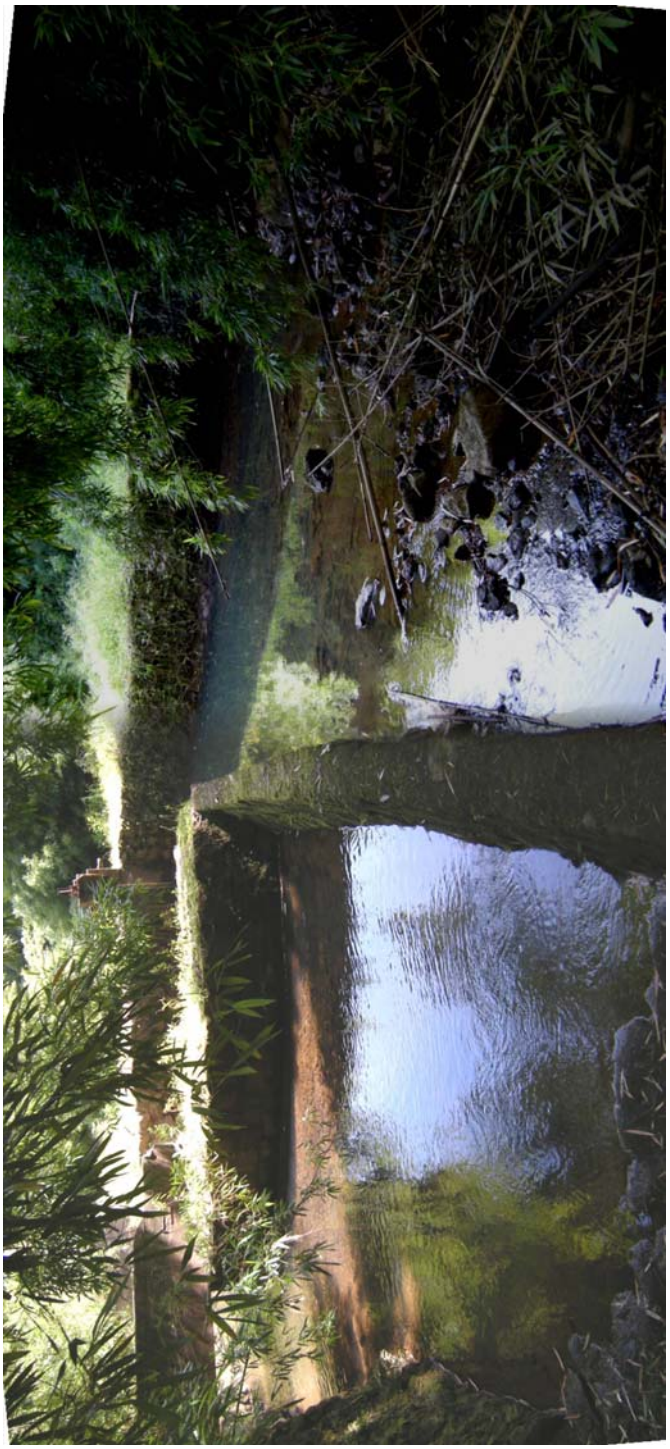
Photograph 3. HI_ Maui County_Kolea Reservoir_3. Catwalk and upstream dam embankment showing the rep rap section. Note the outlet valve shaft extending down just to the right of the vertical pole supports of the catwalk. View facing south.

Photograph 4. HI_ Maui County_Kolea Reservoir_4. The crest of the Kolea Dam. The vehicle is parked adjacent to the catwalk. View facing northeast.

Photograph 5. HI_ Maui County_Kolea Reservoir_5. Spillway cut into the rock at the south abutment of the dam, with the spillway inlet in the background. Note the narrow natural gully at the lower right. The basin of the reservoir is in the background, the dam extends to the left View facing southeast.

Photograph 6. HI_ Maui County_Kolea Reservoir_6. Down stream slope of the dam. Note the vehicle parked adjacent to the catwalk. View facing northeast.

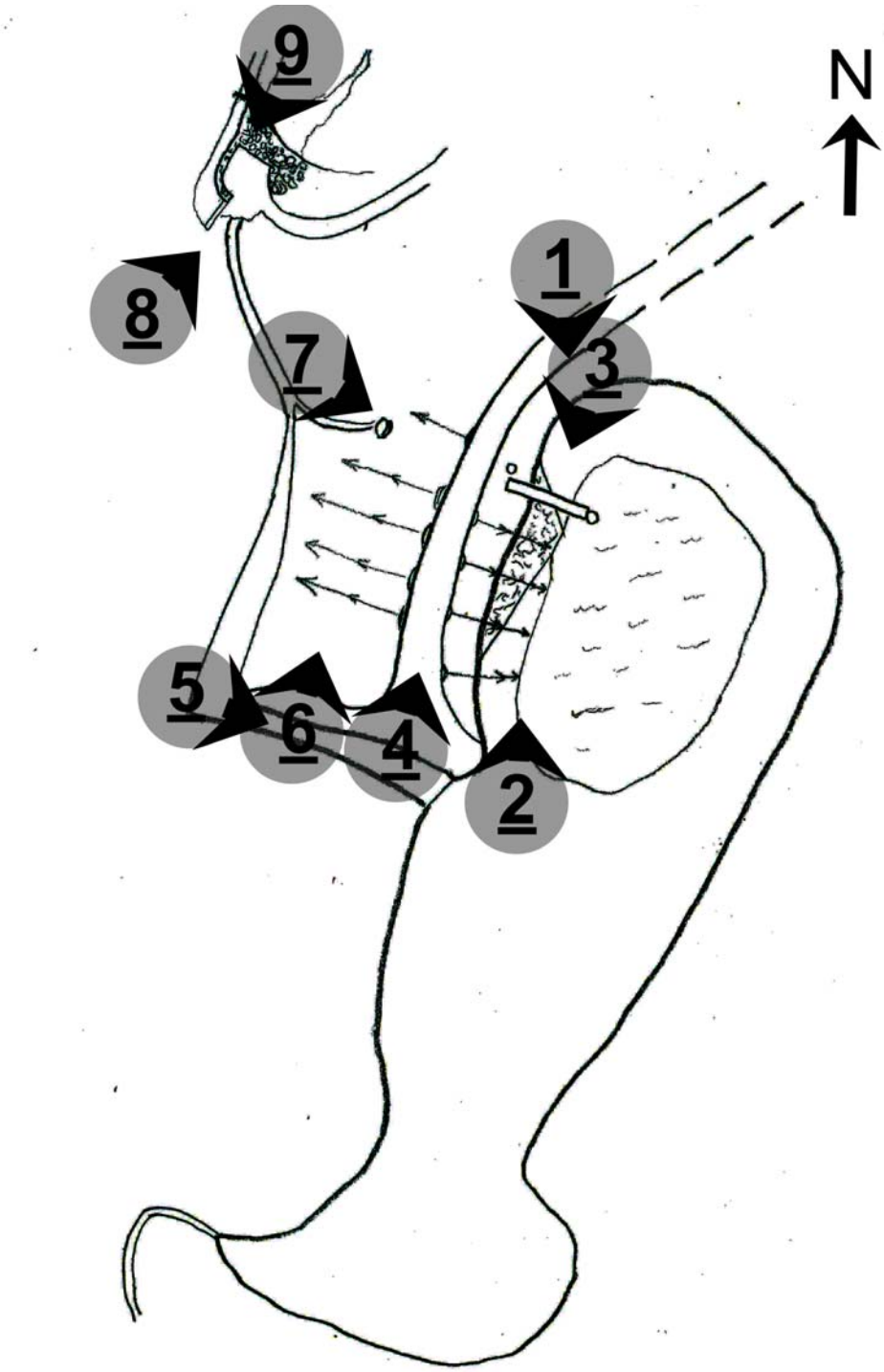
Photograph 7. HI_ Maui County_Kolea Reservoir_7. Detail view of the visible portion of the outlet works at the downstream toe of the dam. View facing southeast.



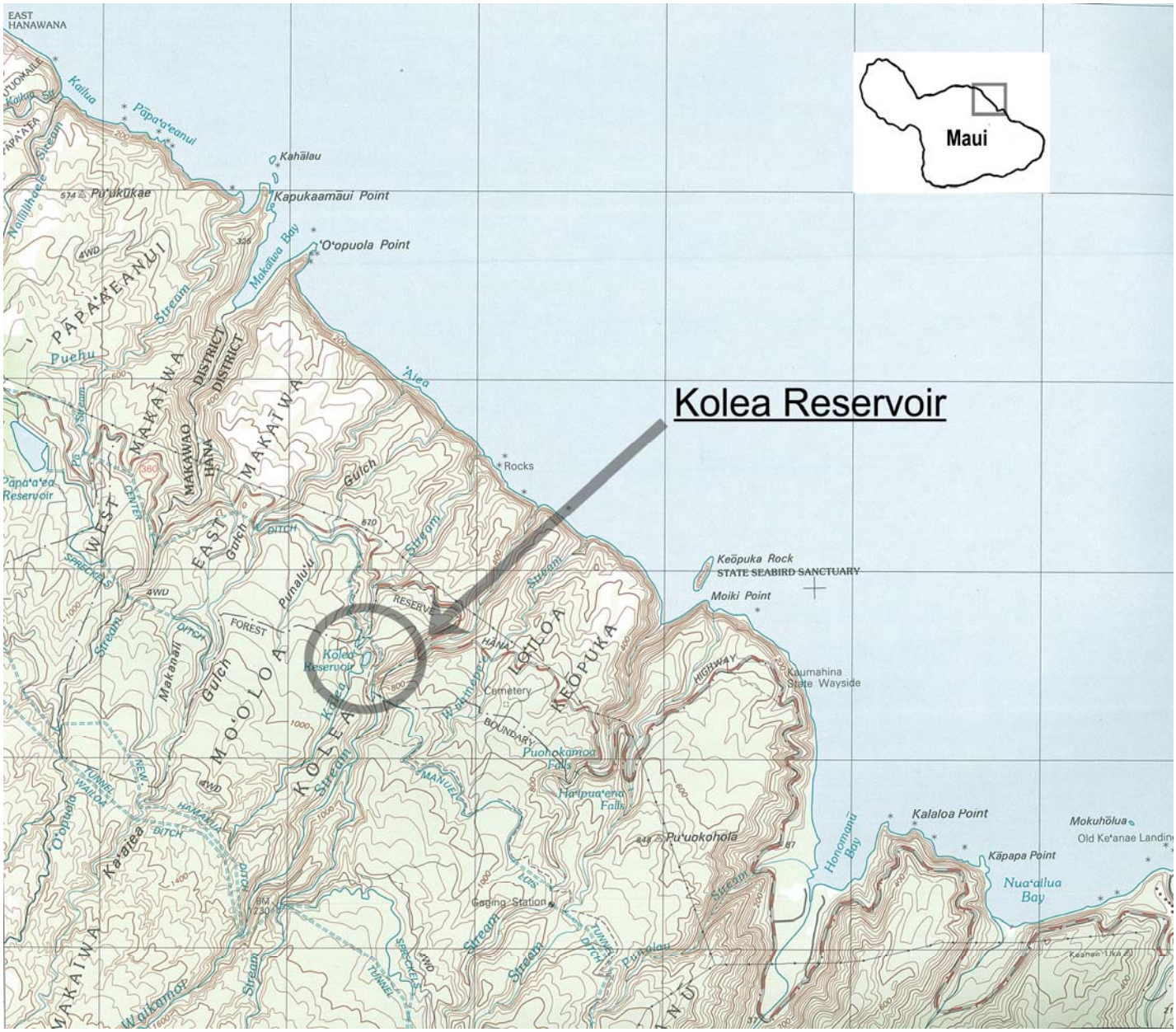
Photograph 8. HI_ Maui County_Kolea Reservoir_8. View of the diversion structure below the Kolea Reservoir looking downstream. The Center Ditch inlet is on the right. In the right foreground is the rocky bed of the Kolea Stream with the flow from the reservoir outlet and spillway entering the mixing pool. The 10" wide concrete wall extends up from the (off camera) foreground. The continuation of the Center Ditch is on the left side of the 10" wide wall. View facing northeast.

Photograph 9. HI_ Maui County_Kolea Reservoir_9. Diversion structure looking upstream. The mixing pool is in the upper center of the photo with the 4' wide wall and continuation of the Center Ditch on the right. Note the wide wall (dam) extending up to the left that impounds the mixing pool. The rectangular outlet works can be seen on the downstream side of the wide wall (dam). The Kolea Stream bed below the diversion structure extends to the left of the photo. View facing southwest.

Photo Key map showing the orientation of the above photos. Not to scale.



Location map for Kolea Reservoir on Maui. North at top.



APPENDIX D

Biological Survey

AECOS No. 1228

Biological surveys for the Kōlea Reservoir dam removal project, East Maui

Prepared by:

AECOS Inc.
45-939 Kamehameha Hwy, Suite 104
Kāneʻohe, Hawaiʻi 96744-3221

June 15, 2010

Biological surveys for the Kōlea Reservoir dam removal project, East Maui

June 15, 2010 *AECOS* No. 1228

Eric Guinther, Reginald David[1], and Chad Linebaugh
AECOS, Inc.
45-939 Kamehameha Hwy, Suite 104
Kāne'ohe , Hawai'i 96744
Phone: (808) 234-7770 Fax: (808) 234-7775 Email: aecos@aecos.com

Introduction

In April 2010, *AECOS*, Inc. biologists conducted biological surveys on and around Kōlea Stream in the vicinity of Kōlea Reservoir on windward east Maui (Fig. 1). *AECOS*, Inc. was contracted by Oceanit Laboratories Inc.[2] to investigate aquatic and forest environments for the proposed decommissioning of the Kōlea Reservoir dam. The primary purpose of the surveys was to determine if any biological resources of interest or concern, and particularly if any species currently listed as threatened, endangered, or proposed for listing under either the federal or state endangered species programs, occur on or within the immediate vicinity of Kōlea Dam, and assess whether biological resources might be impacted by removal of the dam. This report details findings of those surveys.

Stream Description

Kōlea Stream (state perennial stream ID number 6-4-03) arises as a perennial stream around the 1200-ft (366-m) elevation on East Maui Mountain, flowing northeast to the shore roughly midway between Maka'iwa Bay and Honomanu Bay. The stream is shown on USGS topographic maps as perennial only down to Kōlea Reservoir, and intermittently flowing below the reservoir. A short distance downstream of the dam, stream water is taken off by the Manuel Luis Ditch (or Center Ditch), which also intercepts flow from nearby Waikamoi Stream at the 680-ft (210-m) elevation. The Kōlea watershed is only 121 ac (49

[1] Rana Biological Consulting, Inc., Kailua-Kona, Hawai'i.

[2] This document will be incorporated into the Environmental Assessment (EA) for the Kōlea Dam Removal Project and will become part of the public record.

ha) in area (OSP, 1994), smaller than adjacent Kaʻaiea (676 ac or 274 ha) to the west (much smaller Punaluʻu Gulch lies between) and Waikamoi[3] to the east.

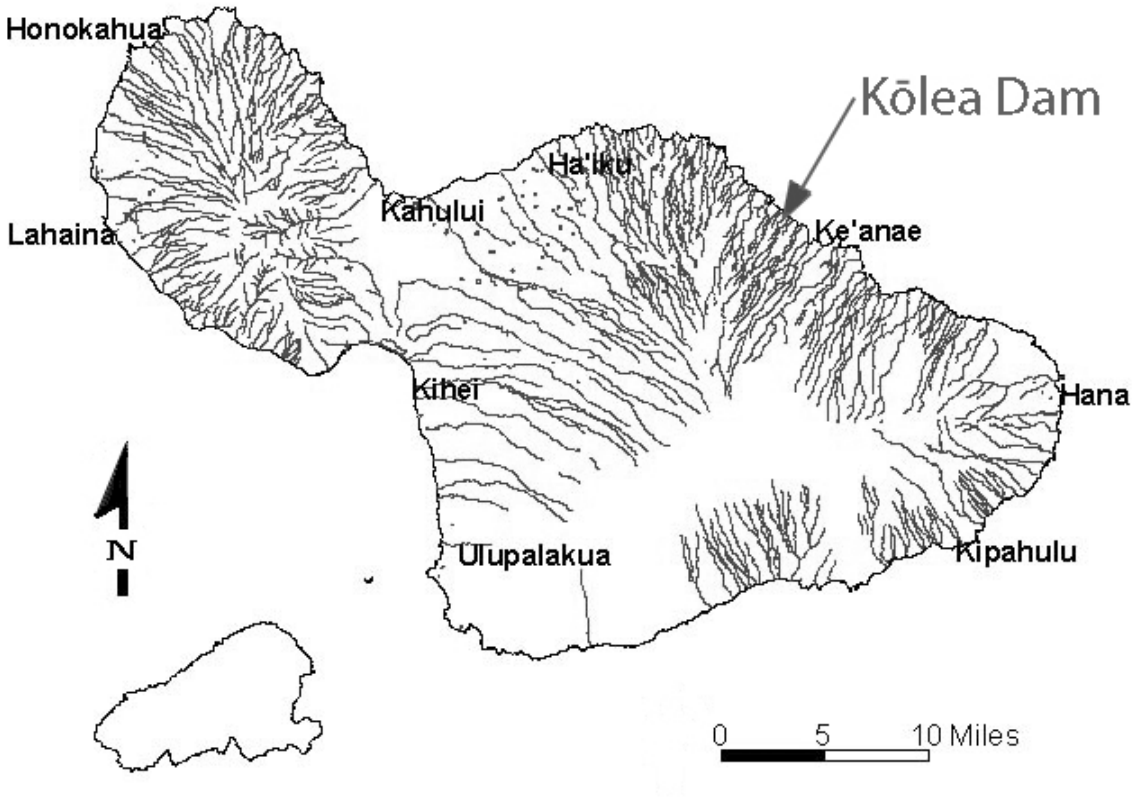


Figure 1. The general location of the project site on a map of Maui streams.

At Kōlea Reservoir and upstream, the stream is confined to a narrow gulch with steep sides. The reservoir itself partly fills this gulch, the steep sides of which make accessing the shore very difficult (Fig. 2). The dam is accessible via an unimproved road at a distance of approximately one-quarter mile (0.4 km) in from (mauka) the Hāna Highway (State Rte. 360).

[3] Inexplicably, the acreage of Waikamoi is given as 448 and 449 ac (OSP, 1994); however, it is clearly many times larger. Waikamoi arises near the top of East Maui Mountain in the vicinity of Puʻu Nianiau and Hosmer Grove on the Haleakala Highway, and is roughly comparable in size to the Pūohokamoa watershed to the east, put at 2000 ac (809 ha) by OSP.

Figure 2. Kōlea Reservoir looking upstream from the north end of the dam.

Survey Methods

Field surveys were conducted by the survey team on April 14, 2010. Weather conditions were generally very good, although stream flow was well above normal.

Botanical Resources

The botanical survey entailed walking throughout the area on unimproved roads and trails and identifying all species of flowering plants encountered. Binoculars were used to identify plants on inaccessible steep slopes along the west side of the reservoir and stream immediately downstream of the spillway. The survey extended to the area where the Manuel Luis Ditch crosses Kōlea

Stream and upstream in the area of the Waikamoi Nature Trail. Plants were identified in the field, or collected for later identification in the laboratory. In some cases, photographs were taken in lieu of collected material.

Aquatic Biota

AECOS, Inc biologists surveyed aquatic biota at several locations in Kōlea Stream, Kōlea Reservoir, and Center (Manuel Luis) Ditch. Surveys were conducted by observing project waters for fishes and invertebrates and netting off stream and reservoir banks with a long-handled dip net (0.25 in or 6 mm mesh). Survey locations included all points along the stream and reservoir where the biologist could safely access the waterway. High stream flow generated by rainfall in the area the previous night precluded entry into the water and limited sampling locations to six in Kōlea Stream: three locations along the stream upstream of the reservoir, in the reservoir spillway, the intersection of Kōlea Stream and Center Ditch, and the stream at the Hāna Highway Bridge.

Kōlea Reservoir was surveyed from six locations along the shore: below the pier extending out from the dam, near the spillway, near the center of the eastern shoreline, two locations along the southern shoreline, and close to where Kōlea Stream enters the reservoir. Steep side slopes, brisk water flow, and dense vegetation prevented access to many parts of the reservoir. Turbid brown waters during the survey precluded surveying the reservoir with mask and snorkel or observing animals in the water from the shore. A 700-ft (210-m) segment of Center Ditch extending north from Kōlea Stream was also briefly surveyed using the dip nets.

Terrestrial Vertebrates

Two avian count stations were sited at either end of the dam. Eight-minute point counts were made at each of the count stations. Each station was counted once. A visual inspection was also made of the dam, surrounding area and Kōlea Stream, a running tally was kept of all avian species detected while within the general project area. Additionally two 30-minute time-dependant waterbird counts were made at the dam, and the outfall area, located immediately below the dam. Field observations were made with the aid of Leica 10 X 42 binoculars and by listening for vocalizations. Additionally, the zoologist walked the project area in a similar fashion as the botanist, to ensure that no additional bird species or habitats not encountered during the time dependant avian counts were present on the site.

All observations of mammalian species were of an incidental nature. With the exception of the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*), or *ʻōpeʻapeʻa* as it is known locally, all terrestrial mammals currently found on the Island of Maui are alien species, and most are ubiquitous. The survey of mammals was limited to visual and auditory detection, coupled with visual observation of scat, tracks, and other animal sign. A running tally was kept of all vertebrate species observed and heard while the biologists were within the project area.

Miscellaneous

Avian phylogenetic order and nomenclature follows *The American Ornithologists' Union Check-list of North American Birds 7th Edition* (American Ornithologists' Union 1998), and the 42nd through the 50th supplements to *Check-list of North American Birds* (American Ornithologists' Union 2000; Banks et al., 2002, 2003, 2004, 2005, 2006, 2007, 2008; Chesser et al., 2009). Mammal scientific names follow *Mammals in Hawaii* (Tomich, 1986). Flowering native and naturalized plant names follow *Manual of the Flowering Plants of Hawaiʻi* (Wagner et al., and Wagner and Herbst, 1990, 1999). Fern names are from *Hawai`i's ferns and fern allies* (Palmer, 2003). Names of ornamentals follow *A Tropical Garden Flora* (Staples and Hervbst, 2005). Place names follow *Place Names of Hawaii* (Pukui et al*.,* 1974). Hawaiian and scientific names are italicized in the text. A glossary of technical terms and acronyms used in the document is included at the end of the narrative text.

Federal and State of Hawaiʻi listed species status follows species identified in the following referenced documents: Division of Land and Natural Resources (DLNR), 1998; U. S. Fish & Wildlife Service (USFWS), 2005a, b, 2009a, 2010).

Survey Results

Botanical Survey

Although a variety of plants occur around and in the vicinity of Kōlea Dam, the landscape is dominated by the highly invasive subspecies of black bamboo known as Henon bamboo (*Phyllostachys nigra henionia*). The extensive, dense stands of this rapidly spreading plant eventually come to dominate to the exclusion of nearly all other species of higher plants (Wagner et al., 1990; Staples and Herbst, 2005). A typical population of Henon bamboo, spreading by underground stems alone (no seed is produced), consists of fairly evenly spaced, vertical stems called culms. With the exception of scattered large trees

that were likely present before the bamboo spread into the area, few if any other plant species exist within these stands (Fig. 3). When these older trees eventually die, they are not replaced, and only the bamboo remains. Were it not for the roads and trails through the area, surveying for biota would have been extremely difficult. Although Henon bamboo stands are fairly easily penetrated because of the relatively even spacing of the culms, once inside a stand, finding other plants becomes a dubious exercise. Not only are other plants very rare, but sight distances are short. Road cuts, the Kōlea dam, stream and ditch areas, and a park-like ridge area associated with the Waikamoi Nature Trail were the only pieces of ground supporting the 80 other species of ferns, conifers, and flowering plants recorded during the survey (Table 1). Of course there remains many areas not distant from Kōlea Reservoir that have not been invaded by Henon bamboo. But in the immediate area of the reservoir, particularly to the north, east, and south, cover by bamboo is nearly complete and the species appears to be slowly expanding (Fig. 3).

Table 1. Checklist of plants found in areas of around Kōlea Dam and vicinity, East Maui, Hawai'i.

Species	Common name	STATUS	ABUNDANCE	NOTES
PTERIDOPHYTES ~ FERNS & FERN ALLIES				
ATHYRIACEAE				
Deparia petersenii (Kunze) M. Kato	---	Nat	R2	<2>
BLECHNACEAE				
Blechnum appendiculatum Willd.	---	Nat	U2	<2>
DICKSONIACEAE				
Cibotium chamissoi Kaulf.	*hāpu'u*	**End**	R	
Cibotium menziesii Hook.	*hāpu'u i'i*	**End**	R	
GLEICHENIACEAE				
Dicranopteris linearis (Burm. f.) Underw.	*uluhe*	**Ind**	U3	
LINDSAEACEAE				
Sphenomeris chinensis (L.) Maxon	*pala'ā*	**Ind**	U	<2>
LYCOPODIACEAE				
Lycopodiella cernua (L.) Pic. Serm.	*wāwae'iole*	**Ind**	R	<2>
NEPHROLEPIDACEAE				
Nephrolepis multiflora (Roxb.) F.M. Jarrett ex C.V. Morton	sword fern	Nat	R	

Table 1 (continued).

Species	Common name	STATUS	ABUNDANCE	NOTES
POLYPODIACEAE				
Phlebodium aureum (L.) J. Sm.	rabbit's-foot fern	Nat	R	
Phymatosorus grossus (Langsd. & Fisch.) Brownlie	*laua'e*	Nat	U	<1>
PSILOTACEAE				
Psilotum nudum (L.) P. Beauv.	*moa*	**Ind**	R	
THELYPTERIDACEAE				
Christella dentata (Forssk.) Brownsey & Jermy	wood fern	Nat	O	
Christella parasitica (L.) H. Lév.	wood fern	Nat	U	
GYMNOSPERMS				
CONIFERS				
CUPRESSACEAE				
Platycladus orientalis (L.) Franco	Oriental arborvitae	Orn	--	
FLOWERING PLANTS				
DICOTYLEDONS				
AMARANTHACEAE				
Alternanthera sessilis (L.) DC	sessile joyweed	Nat	R	
APIACEAE				
Centella asiatica (L.) Urb.	Asiatic pennywort	Nat	U	
ASTERACEAE (COMPOSITAE)				
Ageratum conyzoides L.	*maile hohono*	Nat	C	<1>
Bidens pilosa L.	*kī,*	Nat	U	<1>
Eclipta prostrata (L.) L.	false daisy	Nat	R	
Elephantopus mollis Kunth	elephant's foot	Nat	--	
Emilia fosbergii Nicolson	Flora's paintbrush	Nat	--	
Erechtites valerianifolia (Wolf) DC	---	Nat	U	<1>
Spagneticola trilobata (L.) Pruski	wedelia	Nat	--	
Synedrella nodiflora (L.) Gaertn.	nodeweed	Nat	--	
Youngia japonica (L.) DC	Oriental hawksbeard	Nat	C	
BEGONIACEAE				
Begonia hirtella Link	---	Nat	U	<1>
BIGNONIACEAE				
Spathodea campanulata P. Beauv.	African tulip tree	Nat	U	<1>
BRASSICACEAE				
Nasturtium sarmentosum (G. Forster ex DC) Schinz & Guillaumin)	*pā'ihi*	**Pol**?	R	<3>
BUDDLEIACEAE				
Buddleia asiatica Lour.	dogtail	Nat	R	

Table 1 (continued).

Species	Common name	STATUS	ABUNDANCE	NOTES
EUPHORBIACEAE				
Aleurites moluccana (L.) Wild.	*kukui*	**Pol**	U	
FABACEAE				
Acacia confusa Merr.	Formosan *koa*	Nat	R	
Chamaecrista nictitans (L.) Moench	partridge pea	Nat	U	
Falcataria moluccana (Miq.) Barneby & Grimes	albizia	Nat	R	<1>
Mimosa pudica L.	sensitive plant	Nat	O	<1>
MALVACEAE				
Hibiscus tiliaceus L.	*hau*	**Ind**	U	
Sida rhombifiolia L.	---	Nat	C	<1>
MELASTOMATACEAE				
Clidemia hirta (L.) D. Don var. hirta	Koster's curse	Nat	C	<1>
Tibouchina herbacea (DC) Cogn.	glorybush	Nat	U	<1>
MORACEAE				
Ficus platypoda (Miquel) Miquel	---	Nat	R	
MYRSINACEAE				
Ardisia elliptica Thunb.	shoe-button ardisia	Nat	A	
MYRTACEAE				
Eucalyptus robusta Sm.	swamp mahogany	Nat	--	
Melaleuca quinquenervia (Cav.) S.T. Blake	paperbark	Nat	C	
Psidium cattleianum Sabine	strawberry guava	Nat	U	
Psidium guajava L.	common guava	Nat	O2	<1>
OLEACEAE				
Fraxinus uhdei (Wenzig) Lingelsh.	tropical ash	Nat	--	
ONAGRACAE				
Ludwigia octovalvis (Jacq.) Raven	primrose willow	Nat	U	
OXALIDACEAE				
Oxalis debilis var. *corymbosa* (A.P. de Candolle) Lour.	pink wood sorrel	Orn	U	<3>
PLANTAGINACEAE				
Plantago major L.	common plantain	Nat	U	
POLYGALACEAE				
Polygala paniculata L.	bubblegum plant	Nat	C	
ROSACEAE				
Rubus rosifolius Sm.	thimbleberry	Nat	U	<3>
SCROPHULARIACEAE				
Castilleja arvensis Cham. & Schlechtend.	Indian paintbrush	Nat	U	<1>

Table 1 (continued).

Species	Common name	STATUS	ABUNDANCE	NOTES
URTICACEAE				
Pilea microphylla (L.) Liebm.	artillery plant	Nat	R1	
VERBENACEAE				
Verbena littoralis Kunth	*ōwī*	Nat	R	
MONOCOTYLEDONES				
AGAVACEAE				
Dracaena marginata Lam.	money tree	Orn	--	
ARACEAE				
Epipremnum pinnatum 'Aureum' G.S. Bunting	pothos	Nat	--	
Monstera delicosa Liebmann	monster	Orn	--	
Syngonium cf. *podophyllum* Schott	nephthytis	Nat	--	
Xanthosoma robustum Schott	'ape	Nat	R	
ARECACEAE				
Dypsis lutescens (H. Wendl.) Beentje & Dransfield	golden-fruited palm	Orn	R	
BROMELIACEAE				
Ananas comosus L.	pineapple	Orn	--	
COMMELINACEAE				
Commelina diffusa N.L. Burm.	day flower	Nat	C	<1>
COSTACEAE				
Costus sp.	spiral flag	Orn	--	<3>
CYPERACEAE				
Cyperus halpan L.	---	Nat	C	<1>
Cyperus polystachyos Rottb.	---	**Ind**	U	<1>
Fimbristylis dichotoma (L.) Vahl	---	**Ind**	R	
Kyllinga brevifolia Rottb.	*kili'o'opu*	Nat	O	
PANDANACEAE				
Pandanus tectorius Z	*hala*	**Ind**	--	
POACEAE (GRAMINEAE)				
Axonopus fisifolius (Raddi) Kuhlm.	carpetgrass	Nat	C3	
Coix lachryma-jobi L.	Job's tears	Nat	U	<1>
Digitaria violascens Link	smooth crabgrass	Nat	O	<1>
Digitaria setigera Roth	*kūkaepua'a*	**Ind**?	R2	
Echinochloa colona (L.) Link	jungle-rice	Nat	R	
Panicum repens L.	torpedo grass	Nat	O3	<3>
Pennisetum purpureum Schumach.	elephant grass	Nat	R	<3>
Paspalum dilatatum Poir.	Dallis grass	Nat	O	

Table 1 (continued).

Species	Common name	STATUS	ABUNDANCE	NOTES
POACEAE (continued)				
Phyllostachys nigra henionia (Mitford) Rendle	Henon bamboo	Nat	AA	<1>
Sacciolepis indica (L.) Chase	Glenwood grass	Nat	A	<1>
Setaria palmifolia (J. König) Stapf	palm grass	Nat	U	
Urochloa mutica (Forssk.) Nguyen	California grass	Nat	R	<1>
ZINGERBERACEAE				
Alpinia purpurata (Viell.) K. Schum.	red ginger	Orn	--	
Hedychium sp.	ginger	Nat	U	<3>

Legend to Table 1

Status = distributional status

End = endemic; native to Hawaii and found naturally nowhere else.

Ind = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.

Nat = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.

Orn = exotic, ornamental or cultivated; plant not naturalized (not well-established outside of cultivation).

Pol = Polynesian introduction before 1778.

Abundance = occurrence ratings for plants in survey area.

R – Rare - only one, two, or three plants seen.

U - Uncommon - several to a dozen plants observed.

O - Occasional - found regularly around the site.

C - Common - considered an important part of the vegetation and observed numerous times.

A - Abundant - found in large numbers; may be locally dominant.

AA - Abundant - abundant and dominant in some areas surveyed, defining vegetation in those areas.

-- - Indicates species observed in the area, but not near the dam project.

Notes:

<1> Observed growing on the dam structure.

<2> Plant associated with wet cliff faces (most are road cuts).

<3> Plant lacking seasonal flowers or fruit; identification uncertain.

As noted, the vegetation aside from the bamboo, consist mainly of remnants of a secondary growth forest, and weedy growth along unimproved roads and on the dam. A few steep slopes (such as the south side of the spillway opposite from the dam; Fig. 4) and cuts support *uluhe* fern (*Dicranopteris linearis*), along with several other fern species (including Hawaiian tree fern), representing remnants of the original, native vegetation in this area. The face of the dam was

Figure 3. Typical, steep margin of Kōlea Reservoir, dominated by Henon bamboo. Note dead tree in bamboo stand; ferns and Koster's curse grow here on the bank below the bamboo.

heavily invaded by Henon bamboo, but this was recently cut down to accomodate engineering surveys of the structure. Although shoe-button ardisia (*Ardisia elliptica*) is listed as abundant in the survey results, it is abundant only in areas lacking or only weakly invaded by bamboo. The same is generally true for the other abundant and common species listed in Table 1. Most of the species occur along the unimproved road, which extends to the top of the ridge overlooking Waikamoi Stream. Others are associated with the dam, stream, or ditch. The Waikamoi Ridge Trail runs along this ridge where a rest pavilion and ornamental plantings are found. This trail is not to be confused with The Nature Conservancy's Waikamoi Preserve (TNC, 2010) on the upper slopes of East Maui Mountain off the Haleakala Highway and located far upslope of the Kōlea Dam project.

Figure 4. Looking across Kōlea Reservoir at spillway with dam to the right. Steep gulch margin on left is mostly covered with native *uluhe* fern.

The total number of flowering plants and ferns listed for the project area (Table 1, excluding species observed in the general area) is 66. Of these 66 species,

two (3.0%) are endemics (uniquely native to the Hawaiian Islands), 8 (12.1%) are indigenous (native to the Hawaiian Islands and elsewhere), and two (3.0%) are Polynesian introductions made before 1778 ("canoe plant"). These percentages are fairly typical of disturbed forests in Hawai'i.

Aquatic Biota

Only a few species of aquatic invertebrate and insect were observed during the April 14, 2010 survey (Table 2). The day mosquito (*Aedes albopictus*) was common throughout the survey area. The scarlet skimmer (*Crocothemis servilia*) was rare, seen flying among the vegetation and around the pier on the dam. The American crayfish (*Procambarus clarkii*) was observed in the reservoir, especially at the south end (stream inflow area). No fishes were observed at any location within the survey area (stream, reservoir or ditch). No fishes or invertebrates were observed in the surveyed short segment of Munuel Luis Ditch below Kōlea Reservoir. A single damselfly was seen, but so briefly it could not be identified.

Table 2. List of aquatic species observed in Kōlea Stream and Kōlea Reservoir during the April 14, 2010 survey.

PHYLUM, CLASS, ORDER, FAMILY *Genus species*	Common name	Abundance	Status	Location
INVERTEBRATES				
ARTHROPODA, INSECTA, DIPTERA				
CULICIDAE				
Aedes albopictus Skuse	day mosquito	C	Nat	<1,2>
ARTHROPODA, INSECTA, HEMIPTERA				
MESOVELIIDAE				
Mesovelia mulsanti White	water treader	R	Nat	<1>
ARTHROPODA, INSECTA, ODONATA				
unid.	dragonfly	R	--	<1,2>
LIBELLULIDAE				
Crocothemis servilia Drury	scarlet skimmer	R	Nat	<1>

Table 2 (continued)

PHYLUM, CLASS, ORDER, FAMILY *Genus species*	Common name	Abundance	Status	Location
ARTHROPODA, MALACOSTRACA, DECOPODA CAMBARIDAE				
Procambarus clarkii Girard	American crayfish	R	Nat	<1>

KEY TO SYMBOLS USED:
Abundance categories:
R – Rare – only one or two individuals observed.
C – Common -observed everywhere, although generally not in large numbers.
Status categories:
Nat – Naturalized – species introduced to Hawai'i intentionally or accidentally.
Location codes:
<1> – Kōlea reservoir.
<2> – Kōlea stream.

Avian Survey

A total of 26 individual birds representing nine different species and eight separate families were recorded during station counts (Table 3). Eight of the species recorded are considered to be alien to the Hawaiian Islands. One avian species, Hawaii Amakihi (*Hemignathus virens wilsoni*), was detected while transiting between count stations.

Not a single waterbird was detected during the time we were within the project area. No avian species currently listed, or proposed for listing under either federal or State of Hawai'i endangered species statutes was detected during the course of this survey.

Avian diversity and densities were extremely low, though likely in keeping with the dense, almost impenetrable Henon bamboo forest present throughout the project area. Two species—Northern Cardinal (*Cardinalis cardinalis*) and Japanese White-eye (*Zosterops japonicus*)—accounted for slightly more than 46% of the total number of birds recorded during station counts. The most frequently recorded species was Northern Cardinal, which accounted for 27% of the total number of birds recorded during station counts. An average of 13 birds was recorded per station count.

Mammalian Survey

Only one mammalian species was detected during the course of the time spent in the project area. One large rat (*Rattus* sp.) was seen climbing in the Henon bamboo grove to the northwest of the spillway below the dam. No mammalian species currently listed, or proposed for listing under either the federal or State of Hawai'i endangered species statutes was detected during the course of this survey.

Assessment

Botanical Resources

The plants found in the project area and on Kōlea Dam itself are almost exclusively non-native and the vegetation is dominated by invasive bamboo. Although some native species occur here, these are mostly ferns and sedges, limited in distribution to the unimproved roads, steep road cuts, and steep gulch margins. No botanical resources of concern from a conservation standpoint occur in the project area. Remnants of the native forest closest to the dam are limited to the steep gulch margins near the dam spillway (across the spillway from the dam). The side of the gulch in this area is so steep that bamboo has been slow or is unable to invade. These steep slopes will preclude the dam removal project from having much of an impact.

Aquatic Resources

No historical biological data could be found for Kōlea Stream or Kōlea Reservoir. The nearest larger streams: O'opuola to the west and Waikamoi and Pū'ohokamoa further east are not ranked very high by DAR for native stream fauna. Native *'ōpae* (*Atyoida bisulcata*) and *'o'opu* (*Awaous guamensis* and *Lentipes concolor*) are reported from the latter two stream systems (DLNR-DAR, 2008). Native *'ōpae* and *'o'opu* are typically not abundant in or upstream of reservoirs of the Hawaiian Islands due to the presence of introduced predator species like tucanare (*Cichla ocellaris*) and bass (*Micropterus* spp.).

Removal of the earthen embankment dam will return this segment of Kōlea Stream to a more natural state that will favor recruitment of native species. The reservoir may at present not support non-native species because these were not introduced and access from downstream would be difficult. Except at certain times of above average flow, water from the reservoir feeds into Manuel Luis Ditch via a pipe (valve shown in Fig. 2). The spillway overflow might not be

Table 3 - Avian Species Detected During Station Counts, Kōlea Dam Project Area

Common Name	Scientific Name	ST	RA
	GALLIFORMES		
	PHASIANIDAE - Pheasants & Partridges		
	Phasianinae - Pheasants & Allies		
Red Junglefowl	*Gallus gallus*	D	0.50
	COLUMBIFORMES		
	COLUMBIDAE - Pigeons & Doves		
Spotted Dove	*Streptopelia chinensis*	A	0.50
Zebra Dove	*Geopelia striata*	A	1.00
	PASSERIFORMES		
	SYLVIIDAE - Old World Warblers & Gnatcatchers		
	Sylviinae - Old World Warblers		
Japanese Bush-Warbler	*Cettia diphone*	A	1.00
	TIMALIIDAE - Babblers		
Hwamei	*Garrulax canorus*	A	1.50
	ZOSTEROPIDAE - White-eyes		
Japanese White-eye	*Zosterops japonicus*	A	2.50
	CARDINALIDAE - Cardinals Saltators & Allies		
Northern Cardinal	*Cardinalis cardinalis*	A	3.50
	FRINGILLIDAE - Fringilline and Carduleline Finches & Allies		
	Carduelinae - Carduline Finches		
House Finch	*Carpodacus mexicanus*	A	1.50
	Drepanidinae - Hawaiian Honeycreepers		
Hawaii Amakihi	*Hemignathus virens*	ER	I -2
	ESTRILDIDAE - Estrildid Finches		
	Estrildinae - Estrildine Finches		
Common Waxbill	*Estrilda astrild*	A	1.00

Key to Table 2

ST	Status
D	Domesticated – Not considered to be established in the wild on the island of Maui
A	Alien – Introduced to the Hawaiian Islands by humans
ER	Endemic Resident – Native and unique to Maui, resident species
RA	Relative Abundance –Number of birds detected divided by the number of count stations (2)
I	Incidental – A species seen while transiting between count stations, followed by the number recorded

a barrier to native anadromous species, but could be a barrier to upstream migration by most non-native species.

Native Damselflies — It is certainly possible that Kōlea Reservoir and/or the water courses in the area support native (endemic) damselflies of the genus *Megalagrion*. *Megalagrion calliphya* and *M. hawaiiense* have been reported from the upper reaches of Waikamoi Stream (DLNR-DAR, 2008). Presently, two species of *Megalagrion* are proposed for listing as endangered: the Flying Earwig Hawaiian Damselfly (*M. nesiotes*) and Pacific Hawaiian Damselfly (*M. pacificum*; USFWS, 2009b,c). Four species of *Megalagrion* are candidate species (USFWS, 2009c): *M. leptodemus*, *M. nigrohamatum nigrolineatum*, *M. oceanicum*, and *M. xanthomelas*. The first three are Oʻahu endemics, only known from that island. *M. xanthomelas*, the orangeblack Hawaiian damselfly, is locally abundant on Molokaʻi, Lanaʻi, and Hawaiʻi. This species tends to breed in coastal wetlands fed by basal springs or in the lower reaches of perennial streams, although will opportunistically exploit temporary pools bordering flashy streams. Eggs are laid on aquatic vegetation (Polhemus and Asquith, 1996).

Historically, the flying earwig Hawaiian damselfly (*M. nesiotes*) was known from the islands of Hawaiʻi and Maui. The species has not been seen on Hawaiʻi for over 80 years, although extensive surveys within apparently suitable habitat in the Kaʻu and Olaʻa areas were conducted from 1997 to 2008. On Maui, the flying earwig damselfly was historically reported from five general locations on the windward side of the island (Kennedy, 1934). The last observation of the species on Maui was in 2005, despite surveys from 1993 through 2008 at several of its historically occupied sites. The 2005 population was associated with *uluhe* fern on a rocky talus slope (USFWS, 2009b). Not much is known about the breeding biology of *M. nesiotes*; what is known suggests this species breeds in "scattered pockets of water [in the forest] or in the bases [leaf axils] of leaves of tropical plants" (Perkins, related by Kennedy, 1934). Adults appear not to associate with streams, so impacts to this species as a result of removal of Kōlea Dam is unlikely.

The Pacific Hawaiian damselfly (*M. pacificum*) is now believed to be extirpated from the islands of Oʻahu, Kauaʻi, and Lanaʻi (Polhemus and Asquith, 1996). It was believed that the species had been extirpated from the Island of Hawaiʻi when in 1998 a population was discovered within a small stream along the Hamakua Coast (Englund, 1998). *M. pacificum* breeds in seepage fed pools bordering the terminal reaches of perennial streams (Moore and Gagne, 1982; Polhemus and Asquith, 1996). They seem to prefer areas of dense vegetation, and seem not to stray far from breeding pools. This habitat is not present in the project area.

Several other species of Hawaiian damselflies (*M. blackburni*, *M. calliphya*, *M. hawaiiense,* and *M. koelense*) are known from windward East Maui (Polhemus and Asquith, 1996). These species are presently not protected, and are generally upland dwellers found at much higher elevations than Kōlea Reservoir. *M. hawaiiense* is the species most likely to be seen in the project vicinity and is the most frequently encountered native damselfly in Hawai‘i. Juveniles of this species live in "thin sheets of water on wet mossy rocks or dripping banks adjacent to streams…" (Polhemus and Asquith, 1996, p. 55).

Native Stream Fauna — Unfortunately nothing is known about the native species of fishes, crustaceans, and mollusks living in Kōlea Stream. No native and only five (including four insects) non-native aquatic species were observed in April or have been previously reported from this small stream system. Impediments to upstream migration include a steep drop into the ocean at the shore and a low head dam on the stream at the point where the Manual Luis Ditch crosses (essentially at stream elevation) Kōlea Stream (Fig. 5). These impediments would likely limit upstream migration of non-native fishes, but would not pose a barrier to all of the native species, several of which are capable of scaling waterfalls. and only The non-native crayfish (*Procambarus clarkii*) observed in the reservoir is capable of overland migration.

Larger stream systems to the east harbor native aquatic animals as discussed above (for Waikamoi Stream), and these streams are connected to Kōlea Stream by the Manuel Luis Ditch which captures flow from Punalau Stream and outflow from the Kōlea Powerhouse[4]. Thus, lateral connections between these East Maui stream systems exist that likely serve as routes for both native and non-native aquatic fauna. Thus, Kōlea Stream is not isolated from other streams in the area, although access from the ditch up to the reservoir may not be possible for non-native fishes.

With removal of the dam, the ditch diversion (and its low head dam) will remain. This structure is a likely block to upstream migration by non-natives from the highway bridge (where introductions of aquarium species might occur). However, the ditch connects Kōlea Stream with many others along this northern slope, suggesting all of these streams share both native and non-native aquatic fauna. Ideally, removal of the Kōlea Reservoir Dam will leave a stream bed of sufficient steepness to act as a barrier to upstream migration by non-native species. Kōlea is a very short stream compared with most streams on this windward slope of East Maui (DAR size rating: 1 and reach diversity rating: 2; out of 10 possible). The reservoir is located approximately midway between

[4] Another stream with the name, Kōlea, and a long tunnel from Nua‘ailua Stream feed the powerhouse penstock. The outflow is then fed to the Manuel Luis Ditch, with any excess going into intermittent Punalau Stream and Honomanu Bay.

the mouth and the headwater, so gains in native stream fauna habitats will not be substantial from removal of this dam. Modifications to the physiography of the stream channel to create a barrier to upstream migration by non-natives could be justified only if the cost were low.

Figure 5. Kōlea Stream at Manuel Luis Ditch at a time of above normal flow. In this photo, the ditch flows from left to right just beyond the biologist's net. Kōlea Stream flows in from background left and, at high flow, over the approximately 18-ft (6-m) dam in the foreground right. The valve at left allows diversion of water via a pipe to the stream bed downstream of the dam structure.

Avian Resources

All but one of the 10 avian species detected during the course of this survey are considered to be alien to the Hawaiian Islands. The lone native species detected, Hawaii Amakihi was seen away from the dam, one along ridge separating the dam from the Waikomoi Stream gulch and the other adjacent to Kōlea Stream, at the Hāna Highway. The two *'amakihi* recorded are of the endemic Maui sub-species. *'Amakihi* are only one of six extant endemic forest birds with relatively

large populations that, at least in East Maui, are currently thought to be maintaining stable or possibly increasing populations (Gorresen, et. al, 2009).

One species detected, Red Junglefowl (*Gallus gallus*), is currently not considered to be established in the wild on the Island of Maui. Avian diversity was relatively low, though in keeping with the location of the site and the vegetation present within the project are.

Hawaiian Petrel and Newell's Shearwater — Although not detected during this survey, both the endangered Hawaiian Petrel (*Pterodroma sandwichensis*) and the threatened endemic sub-species of the Newell's Shearwater (*Puffinus auricularis newelli*) may over-fly the project area between April and the end of November each year. Both species have been recorded flying to and from their nesting colonies located in the mountains to the west and east of the project site (DOFAW unpublished seabird data 1994-2009; Cooper and Day, 2003, 2004; Day and Cooper, 1999). Both of these pelagic seabird species nest high in the mountains in burrows excavated under thick vegetation, especially *uluhe* fern.

The primary cause of mortality in both Hawaiian Petrels and Newell's Shearwaters is thought to be predation by alien mammalian species at the nesting colonies (USFWS, 1983; Simons and Hodges, 1998; Ainley et al., 2001). Collision with man-made structures is considered to be the second most significant cause of mortality of these seabird species in Hawai'i. Nocturnally flying seabirds, especially fledglings on their way to sea in the summer and fall, can become disoriented by exterior lighting. When disoriented, seabirds often collide with manmade structures, and if they are not killed outright, the dazed or injured birds are easy targets of opportunity for feral mammals (Hadley, 1961; Telfer, 1979; Sincock, 1981; Reed et al., 1985; Telfer et al., 1987; Cooper and Day, 1998; Podolsky et al., 1998; Ainley et al., 2001; Hue et al., 2001; Day et al., 2003).

Mammalian Resources

The findings of the mammalian survey are consistent with the location of the site and the dense vegetation currently present on the property. It is likely that one or more of the four established alien rodents known from the Island of Maui, roof rat (*Rattus r. rattus*), Norway rat (*Rattus norvegicus*), Polynesian rat (*Rattus exulans hawaiiensis*), and European house mice (*Mus musculus domesticus*), use resources within the general project area on a seasonal basis. The one rat observed close to the dam was seen so briefly that it was not possible to identify to species.

Critical Habitat

There are no federally designated Critical Habitats for any plant or animal species currently protected under the endangered species act of 1973, as amended within the project action area.

Conclusions

It is not expected that the decommissioning to the Kōlea Dam and any attendant environmental modification within the project site will have a negative impact on any plant or animal species currently listed as endangered, threatened, or any that are currently proposed for listing under either federal or state endangered species statutes. Furthermore, the proposed action will not result in modification of any federally designated Critical Habitat, as there is none present on the subject property.

None of the aquatic species observed during these surveys is listed as threatened or endangered by the U.S. Fish and Wildlife Service under the Endangered Species Act of 1973, as amended, or by the State of Hawaii under its endangered species program (DLNR, 1998; USFWS, 2009). A Best Management Practices (BMP) plan should be designed and implemented to minimize environmental impacts to water quality in the vicinity of and downstream of the project site. Construction (dam removal) should be limited to the dry season to avoid sediment being carried by Kōlea Stream into Center Ditch or the Pacific Ocean. If possible, stream bed creation/alteration in place of the reservoir dam should include a waterfall feature lacking an overhanging lip.

From a native avian and mammalian perspective there is nothing unique about the habitat present within the project site, and none of the habitat is important habitat for any listed avian or mammalian species currently known from the Island of Maui.

If night-time construction activity or equipment maintenance is proposed during the construction phases of the project, all associated lights should be shielded, and when large flood/work lights are used they should be placed on poles that are high enough to allow the lights to be pointed directly at the ground.

If street lights or facility lighting is installed as part of this project, it is recommended that lights be shielded to reduce the potential for interactions of nocturnally flying Hawaiian Petrels and Newell's Shearwaters with external lights and man-made structures (Reed et al., 1985; Telfer et al., 1987). This

minimization measure would serve the dual purpose of minimizing the threat of disorientation and downing of Hawaiian Petrels and Newell's Shearwaters, while at the same time complying with the Maui County Code § 20.35 *et seq*. that requires that all new exterior lights on Maui be shielded.

Glossary

Alien - Introduced to Hawai'i by human actions.
Commensal – Animals that share humans' food and lodgings, such as rats and mice.
Domesticated – Feral species, not considered established in the wild on the Island of Maui.
Endangered – Listed and protected under the ESA as an endangered species.
Endemic – Native and unique to the Hawaiian Islands.
Indigenous - Native to the Hawaiian Islands, but also found elsewhere naturally.
Low Head Dam – Also called a "run of the river dam"; a man-made structure built across a stream creating an impoundment within the banks of the stream (as opposed to creating a reservoir flooding land upstream well above the stream banks).
Naturalized – A plant or animal that has become established in an area where it is not native.
Ruderal – Disturbed areas, such as roadways and graded lots.
Threatened - Listed and protected under the ESA as a threatened species.
DLNR – Hawai'i State Department of Land & Natural Resources.
ESA - Federal Endangered Species Act of 1973, as amended.
USFWS – U.S. Fish & Wildlife Service

References

Ainley, D. G, R. Podolsky, L. Deforest, G. Spencer, and N. Nur. 2001. The Status and Population Trends of the Newell's Shearwater on Kaua'i: Insights from Modeling, *In*: Scott, J. M, S. Conant, and C. Van Riper III (editors) *Evolution, Ecology, Conservation, and Management of Hawaiian Birds: A Vanishing Avifauna.* Cooper's Ornithological Society, Allen Press, Lawrence, Kansas. Studies in Avian Biology No. 22: 108-123.

American Ornithologist's Union. 1998. *Check-list of North American Birds*. 7th edition. AOU. Washington D.C. 829pp.

_____. 2000. Forty-second supplement to the American Ornithologist's Union *Check-list of North American Birds*. *Auk,* 117: 847-858.

Banks, R. C., C. Cicero, J. L. Dunn, A. W. Kratter, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz. 2002. Forty-third supplement to the American Ornithologist's Union *Check-list of North American Birds*. *Auk*, 119: 897-906.

_____ , _____, _____, _____, _____, _____, _____, and _____. 2003 Forty-fourth supplement to the American Ornithologist's Union *Check-list of North American Birds*. *Auk*, 120: 923-931.

_____ , _____, _____, _____, _____, _____, _____, and _____. 2004 Forty-fifth supplement to the American Ornithologist's Union *Check-list of North American Birds*. *Auk*, 121: 985-995.

_____ , _____, _____, _____, _____, _____, _____, and _____. 2005 Forty-sixth supplement to the American Ornithologist's Union *Check-list of North American Birds*. *Auk*, 122: 1031-1031.

_____ , _____, _____, _____, _____, _____, _____, and _____. 2006 Forty-seventh supplement to the American Ornithologist's Union *Check-list of North American Birds*. *Auk*, 123: 926-936.

_____, C. R. Terry Chesser, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz. 2007 Forty-eighth supplement to the American Ornithologist Union *Check-list of North American Birds*. *Auk*, 124: 1109-1115.

_____, _____, _____, _____, _____, _____, _____, _____, _____, _____, and K. Winker. 2008 Forty-ninth supplement to the American Ornithologist Union *Check-list of North American Birds*. *Auk*, 125: 758-768.

Chesser, R. T., R. C. Banks, F. K. Barker, C. Cicero, J. L. Dunn, A. W. Kratter, I. J. Lovette, P. C. Rasmussen, J. V. Remsen, Jr., J. D. Rising, and D. F. Stotz, and K. Winker. 2009. Fiftieth supplement to the American Ornithologist Union *Check-list of North American Birds*. *Auk*, 126: 1-10.

Cooper, B. A., and R. H. Day. 1998. Summer Behavior and Mortality of Dark-rumped Petrels and Newell's Shearwaters at Power Lines on Kauai. *Colonial Waterbirds*, 21(1): 11-19.

_____ and _____. 2003. Movement of Hawaiian Petrels to inland breeding sites on Maui Island, Hawaii. *Waterbirds*, 26: 62-71.

Cooper, B. A., and R. H. Day. 2004. Results of Endangered Bird and Bat Surveys at the Kaheawa Pastures Wind Energy Facility on Maui Island, Hawaii, Fall 2004. Prep. for Kaheawa Wind Power LLC, Makawao, HI and UPC Wind Management, LLC, Newton, MA.

Day, R. H., and B. A. Cooper. 1999. Results of Endangered Bird and Bat Surveys at the Proposed Kaheawa Pastures Wind Energy Facility on Maui Island, Hawaii, Summer 1999. Prep. for Zond Pacific, Wailuku, HI.

_____, _____, and T. C. Telfer. 2003. Decline of Townsend's (Newell's Shearwaters (*Puffinus auricularis newelli*) on Kauai, Hawaii. *The Auk*, 120: 669-679.

Department of Land and Natural Resources. (DLNR). 1998. Indigenous Wildlife, Endangered and Threatened Wildlife and Plants, and Introduced Wild Birds. Department of Land and Natural Resources. State of Hawaii. Administrative Rule §13-134-1 through §13-134-10, dated March 02, 1998.

_____ - Dept. of Aquatic Resources (DLNR-DAR). 2008. Atlas of Hawaiian Watersheds & Their Aquatic Resources. Island of Maui. 866 pp.

Englund, R. A. 1998. New records and range extensions of native Odonata (Coenagrionidae) and introduced aquatic species in the Hawaiian Islands. *Bishop Museum Occ. Pap*., 59: 15-16.

Gorresen, M. P, R. J. Camp, M. H. Reynolds, B. L. Woodworth, and T. K. Pratt. 2009. Status and Trends of Native Hawaiian Songbirds. *In:* Pratt. T. K., C. T. Atkinson, P. C. Banko, and B. L. Woodworth (editors) *Conservation Biology of Hawaiian Forest Birds*. Yale University Press. 707 pp.

Hadley, T. H. 1961. Shearwater calamity on Kauai. *Elepaio*, 21: 60.

Hue, D., C. Glidden, J. Lippert, L. Schnell, J. MacIvor and J. Meisler. 2001. Habitat use and limiting factors in a population of Hawaiian Dark-rumped Petrels on Mauna Loa, Hawai'i. Pp. 234-242, *in*: Scott, J. M, S. Conant, and C. Van Riper III (editors) *Evolution, Ecology, Conservation, and Management of Hawaiian Birds: A Vanishing Avifauna.* Studies in Avian Biology No. 22. Cooper's Ornithological Society, Allen Press, Lawrence, Kansas.

Kennedy, C. H. 1934. *Kilauagrion dinesiotes*, a new species of dragonfly (Odonata) from Hawaii. *Annals. Ent. Soc. Amer*., 27: 343-345.

Moore, N. W., and W. C. Gagne. 1982. *Megalagrion pacificum* (McLachlan) – A preliminary study of the conservation requirements of an endangered species. Reports of the Odonata Specialist Group Species Survival Commission, International Union for Conservation of Nature and Natural Resources 3: 1-5.

Office of State Planning (OSP). 1994. State definition and delineation of watershed. Prep. by Geographic Decision Systems International and Eugene P. Dashiell, AICP.

Palmer, D. D. 2003. *Hawai`i's ferns and fern allies*. University of Hawaii Press, Honolulu. 324 pp.

Podolsky, R., D. G. Ainley, G. Spencer, L. de Forest, and N. Nur. 1998. Mortality of Newell's Shearwaters Caused by Collisions with Urban Structures on Kaua'i. *Colonial Waterbirds,* 21: 20-34.

Polhemus, D. A. 1995. New Heteroptera and Odonata (Insecta) records and range extensions in the Hawaiian Islands. *Bishop Mus. Occas. Pap*., 42: 42-43.

_____. 2004. A revision of the Hawaiian damselflies in the genus *Megalagrion* (Odonata: Coenagrionidae). Unpublished report to U.S. Fish and Wildlife Service, Pacific Islands Office. pp. 1-2, 36-40, 43-48, 52-54, and 58-68.

_____, and A. Asquith. 1996. *Hawaiian Damselflies. A Field Identification Guide*. Bishop Museum Press. 122 pp.

Pukui , M. K., S. H. Elbert, and E. T. Mookini. 1974. *Place Names of Hawaii*. University of Hawaii Press. Honolulu, Hawai'i. 289 pp.

Reed, J. R., J. L Sincock, and J. P. Hailman 1985. Light Attraction in Endangered Procellariform Birds: Reduction by Shielding Upward Radiation. *Auk*, 102: 377-383.

Simons, T. R., and C. N. Hodges. 1998. Dark-rumped Petrel (*Pterodroma phaeopygia*). *In:* A. Poole and F. Gill (editors). *The Birds of North America, No. 345*. The Academy of Natural Sciences, Philadelphia, PA. and the American Ornithologists Union, Washington, D.C.

Sincock, J. L. 1981. Saving the Newell ʻs Shearwater. Pages 76-78 in Proceedings of the Hawaii Forestry and Wildlife Conference, 2-4 October 1980. Department of Land and Natural Resources State of Hawaii, Honolulu.

Staples, G. W. and D. R. Herbst. 2005. *A Tropical Garden Flora. Plants Cultivated in the Hawaiian Islands and other Tropical Places*. Bishop Museum, Honolulu. 908 pp.

Telfer, T. C. 1979. Successful Newell's Shearwater Salvage on Kauai. *'Elepaio*, 39: 71

_____, J. L. Sincock, G. V. Byrd, and J. R. Reed. 1987. Attraction of Hawaiian seabirds to lights: Conservation efforts and effects of moon phase. *Wildlife Society Bulletin*, 15: 406-413.

The Nature Conservancy (TNC). 2010. Waikamoi Preserve, Island of Maui. Available at URL http://www.nature.org/wherewework/northamerica/states/Hawaii/preserves/art2358.html; last visited April 26, 2010.

Tomich, P.Q. 1986. *Mammals in Hawaii*. Bishop Museum Press. Honolulu, Hawaii. 37 pp.

U.S. Fish & Wildlife Service (USFWS). 1983. Hawaiian Dark-Rumped Petrel & Newell's Manx Shearwater Recovery Plan. USFWS, Portland, Oregon. February 1983.

_____. 2002. Endangered and Threatened Wildlife and Plants: Designation of Critical Habitat for 60 Plant Species from the Islands of Maui and Kahoolawe, HI. Final Rule. 50 CFR Part 17. *Federal Register*, 68(93; May 14, 2003): 25933-25982.

_____. 2005a. Department of the Interior, Fish and Wildlife Service, 50 CFR 17. Endangered and Threatened Wildlife and Plants. Review of Species That Are Candidates or Proposed for Listing as Endangered or Threatened; Annual Notice of Findings on Resubmitted Petition; Annual Description of Progress on Listing Actions. *Federal Register*, 70 (90; Wednesday, May 11, 2005): 24870-24934.

_____. 2005b. Endangered and Threatened Wildlife and Plants. 50CFR 17:11 and 17:12 (Tuesday, November 1, 2005).

_____. 2009a. Endangered and Threatened Wildlife and Plants. 50CFR 17:11 and 17:12. Available online at URL: http://ecos.fws.gov/tess_public/pub/stateListingIndividual.jsp?state=HI&status=listed; last accessed on April 25, 2010.

U.S. Fish & Wildlife Service (USFWS). 2009b. Endangered and Threatened Wildlife and Plants; Proposed Endangered Status for Flying Earwig Hawaiian Damselfly (*Megalagrion nesiotes*) and Pacific Hawaiian Damselfly (*M. pacificum*) Throughout Their Ranges. Federal Register, 74(129): 32490-32519 (July 8, 2009). Note: several references in this document are cited but not given, or otherwise appear incorrect.

_____. 2009c. U.S. Fish and Wildlife species assessment and listing priority assignment form (*Megalagrion xanthomelas*). URL: http://ecos.fws.gov/docs/candforms_pdf/r1/I063_I01. pdf; last visited January 15, 2010.

_____. 2010. USFWS Threatened and Endangered Species System (TESS), online at URL: http://ecos.fws.gov/tess_public/StartTESS.do

Wagner, W. L., D. R Herbst, and S. H. Sohmer. 1990. *Manual of the Flowering Plants of Hawai'i*. University of Hawaii Press, Honolulu. 1854 pp.

_____ and _____. 1999. *Supplement to the Manual of the Flowering Plants of Hawai'i.* Pp. 1855-1918 *in:* Wagner, W. L., D. R. Herbst, and S. H. Sohmer, *Manual of the Fowering Plants of Hawai'i.* Revised Edition. 2 vols. University of Hawaii Press and Bishop Museum Press, Honolulu.

Page Intentionally Left Blank

APPENDIX E

Geophysical Survey

Global Geophysics

16651 White Mountain Road SE
Monroe, WA 98272
Tel: 425-890-4321
Fax: 360-805-0259

May 6, 2010 Our Ref.: 100-0413.000

Oceanit
828 Fort St. Mall, Suite 600
Honolulu, HI 96813

Attention: Mr. Derrick Elfalan

RE: REPORT ON THE GEOPHYSICAL SURVEY AT KOLEA RESERVOIR, MAUI, HAWAII

Dear Mr. Elfalan:

Global Geophysics conducted a seismic refraction survey at Kolea Reservoir on April 27, 2010. The proposed objectives of the geophysical investigations are to determine the depth to bedrock and rock rippability.

METHODOLOGY AND INSTRUMENTATION

Both electrical resistivity tomography (ERT) and seismic refraction were proposed for this project. However, ERT system was not functioning. Only seismic refraction was used for this study. The following paragraphs describe the method and field procedure.

Seismic refraction

Seismic refraction is the traditional method for determining the rock velocity for rock rippability using a controlled energy source (hammer, blank shotgun shells, or chemical explosives) to generate a seismic signal. The seismic signals are received by a series of geophones (24, for example) that are connected to a seismic cable laid on the ground surface in a linear manner. The geophones, evenly spaced along the geophone cable, are placed on the ground surface. The seismic energy source is discharged at several places along the array and off both ends.

The seismic wavelets travel through the earth to the geophones that convert the acoustic energy in the ground to an electric signal in the geophone cable. The seismograph detects the arriving electric signals with respect to time and stores the records for future data processing. The seismic data is processed to determine the seismic velocity of the earth material through which the energy has traveled and to model the subsurface geology. This geophysical model depicts the earth in cross-section showing the velocity and thickness of the subsurface layers below the seismic line

The seismic refraction survey was conducted using a Geometrics Geode 24-channel digital seismograph. The sensors were Mark Products 4.5-Hz vertical geophones and the seismic energy sources were a 20 lbs sledge hammer. The weight drop method appeared to provide sufficient energy and it was subsequently used for the survey. The typical field procedure consisted of laying out the cables and planting the geophones at 10-16.4 ft intervals. The sledge hammer was pounded at seven

locations along the geophone array. Data were collected and saved in digital format and a field record was produced on the computer screen to QA/QC the data in real time.

RESULTS

Seismic refraction data was collected along Lines 1 and 2. The locations of these lines are shown in Figure 1. The interpreted profiles are shown in Figure 2. The results are summarized as follows:

1. The depth to bedrock varies from 5 ft to 34 ft;
2. The velocity of the bedrock at the soil/bedrock interface is 7,650 ft/s.

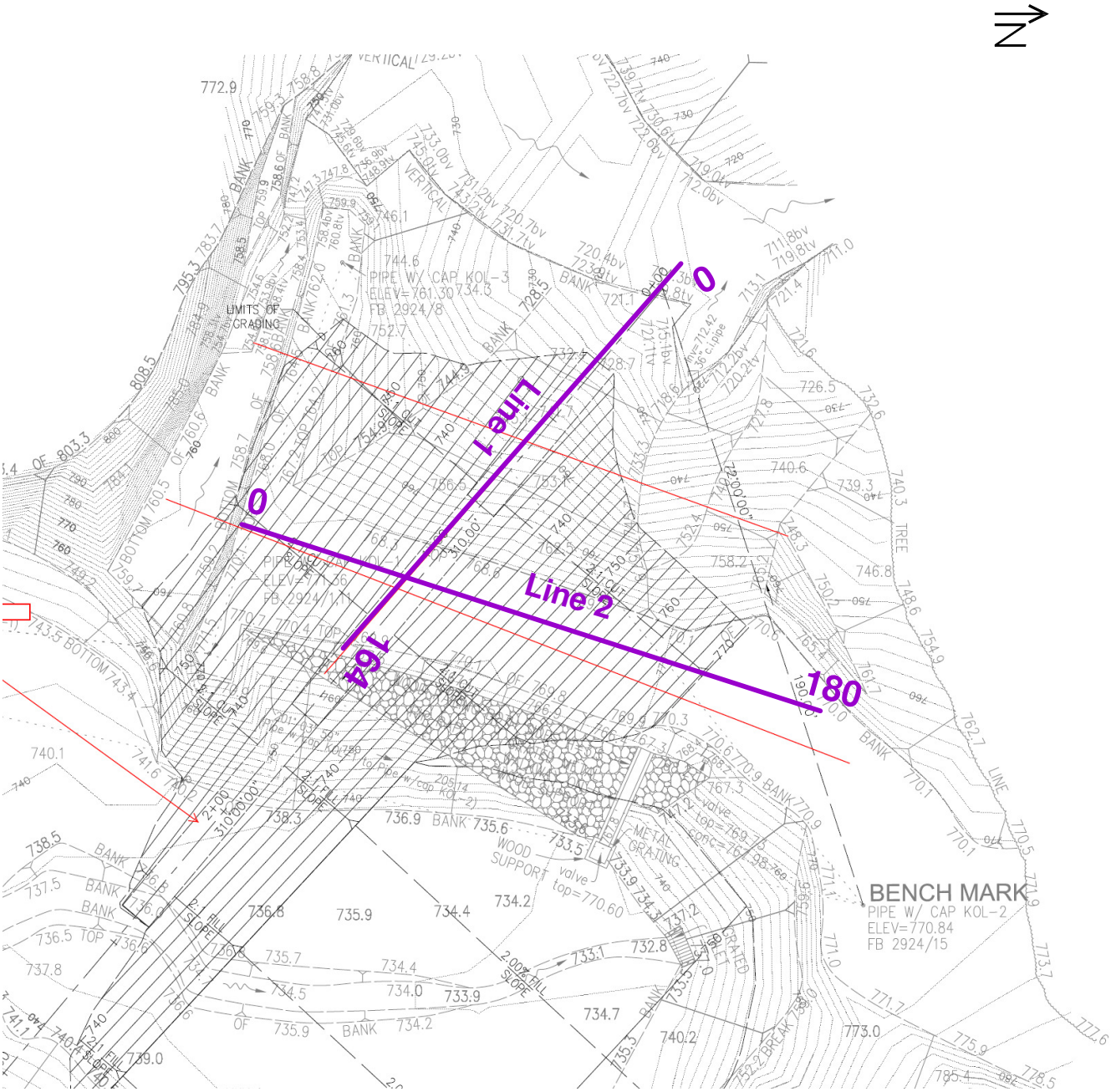
LIMITATIONS OF THE GEOPHYSICAL METHOD

Global geophysics services are conducted in a manner consistent with the level of care and skill ordinarily exercised by other members of the geophysical community currently practicing under similar conditions subject to the time limits and financial and physical constraints applicable to the services. Refraction is a remote sensing geophysical method that may not detect all subsurface conditions due to the limitations of the methods, soil conditions, size of the features and their depths.

Sincerely,

Global Geophysics

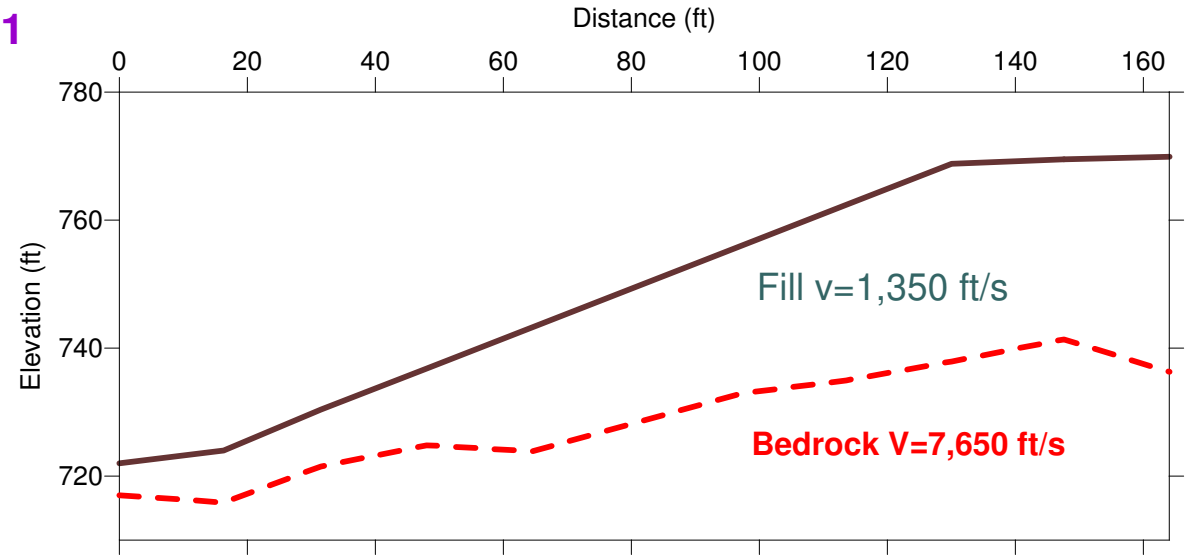
John Liu, Ph.D., R.G.
Principal Geophysicist



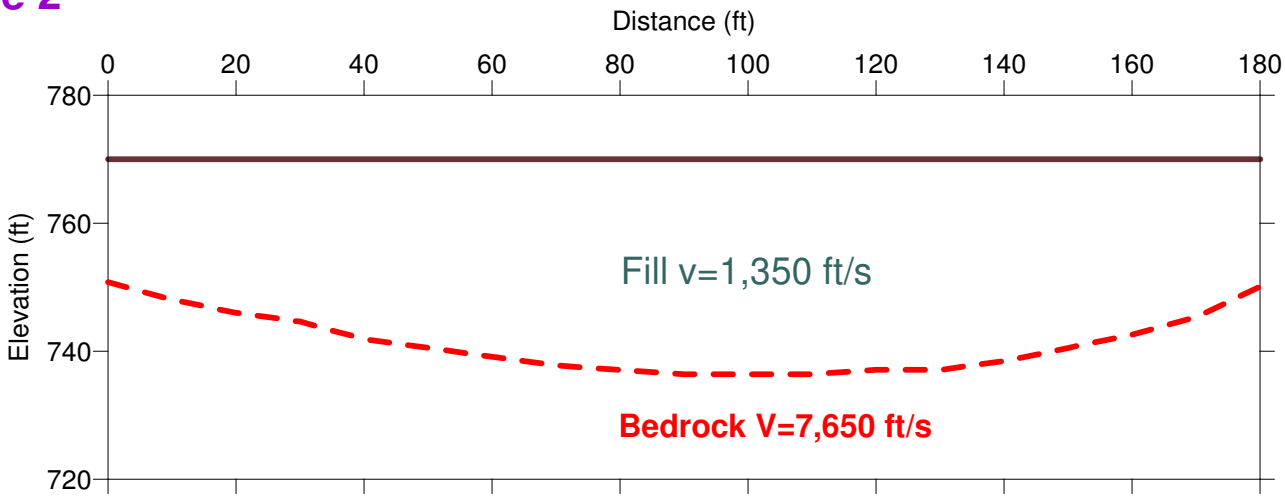
Note: Map is not scaled

PROJECT	**Kelea Reservoir Project** **Oceanit**		
TITLE	**Seismic Line Location Map**		
Global Geophysics 16651 White Mountain Road SE Monroe, WA, 98272 Tel: 425-890-4321	PROJECT NO.: 100-0413.000	FILE No.	
	DESIGN --	SCALE AS SHOWN	REV.
	CADD JL	**FIGURE 1**	
	CHECK JL		
	REVIEW --		

Line 1



Line 2



PROJECT

Kelea Reservoir Project
Oceanit

TITLE

Interpreted Seismic Profiles

Global Geophysics
16651 White Mountain Road SE
Monroe, WA, 98272
Tel: 425-890-4321

PROJECT NO.: 100-0413.000			FILE No.
DESIGN	--		SCALE AS SHOWN REV.
CADD	JL		
CHECK	JL		
REVIEW	--		

FIGURE 2

Page Intentionally Left Blank

APPENDIX F

Construction Plans

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA RESERVOIR (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS

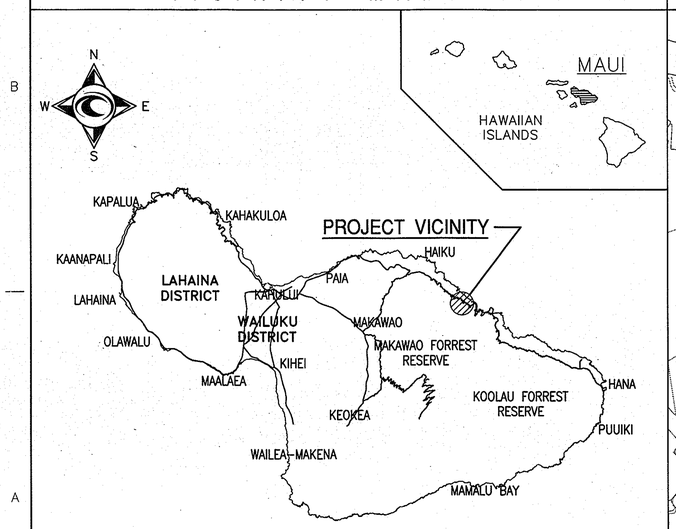
TAX MAP KEY: 1-1-001:050
HAIKU, MAUI, HAWAII

FOR THE
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE OF HAWAII

AND THE
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
PUBLIC WORKS DIVISION
STATE OF HAWAII

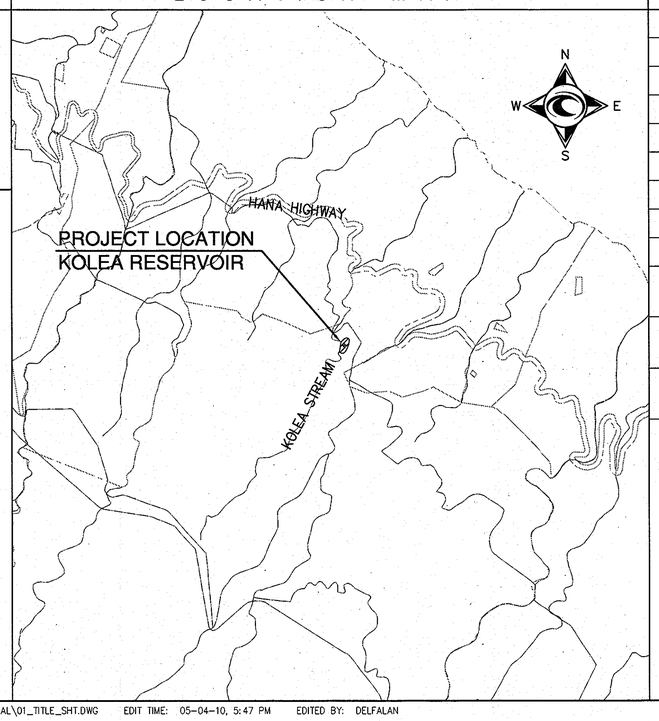
D.A.G.S. JOB NO. 15-23-7409

VICINITY MAP



ISLAND OF MAUI
NOT TO SCALE

LOCATION MAP



SHEET INDEX

DWG. NO.	SHT. NO.	DESCRIPTION OF DRAWINGS
T-1	1	TITLE SHEET
T-2	2	NOTES
T-3	3	NOTES
EG-1	4	EXISTING SITE PLAN
EG-2	5	DEMOLITION PLAN
EC-1	6	STREAM DIVERSION AND EROSION CONTROL PLAN
C-1	7	GRADING PLAN
C-2	8	BREACH CHANNEL – PLAN & PROFILE
C-3	9	BREACH CHANNEL – CROSS SECTIONS STA. 0+00 TO 0+75
C-4	10	BREACH CHANNEL – CROSS SECTIONS STA. 1+00 TO 1+75
C-5	11	BREACH CHANNEL – CROSS SECTIONS STA. 2+00 TO 3+00

APPROVED

5/5/2010
CHAIRPERSON, DEPARTMENT OF LAND AND NATURAL RESOURCES, STATE OF HAWAII — DATE

5/6/10
COMPTROLLER, DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES, STATE OF HAWAII — DATE

5/6/10
PUBLIC WORKS ADMINISTRATOR, DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES, STATE OF HAWAII — DATE

REVISION NO.	SYM.	DESCRIPTION	SHT.__ OF__	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 3, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature — 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

TITLE SHEET

oceanit

DESIGNED BY:	CHECKED BY:	DAGS JOB NO.	DRAWING NO.
AK	DE	15-23-7409	T-1
DRAWN BY: AK	APPROVED BY:	DATE: MAY 2010	SHEET 1 OF 11 SHTS
SCALE: AS NOTED			

FILE_____ DRAWER_____ FOLDER_____

DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\01_TITLE_SHT.DWG EDIT TIME: 05-04-10, 5:47 PM EDITED BY: DELFALAN

GENERAL CONSTRUCTION NOTES

1. ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986 AND STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984, AS AMENDED, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU AND THE COUNTIES OF KAUAI, MAUI, AND HAWAII.

2. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY, AND ENVIRONMENTAL QUALITY.

3. PERMITS SHALL BE OBTAINED BY THE CONTRACTOR.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS", AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL", AS WELL AS CHAPTER 14 OF THE REVISED ORDINANCES OF HONOLULU, AS AMENDED. BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION.

5. THE CONTRACTOR SHALL CONDUCT ALL TESTS SPECIFIED AND BE RESPONSIBLE FOR EXPENSES INCURRED IN CONDUCTING THESE TESTS.

6. VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS PRIOR TO THE START OF CONSTRUCTION. IF DIMENSIONAL ERRORS OR CONFLICTS OCCUR, THE CONTRACTOR SHALL NOTIFY THE OFFICER IN CHARGE (OIC) AND SHALL WAIT FOR CLARIFICATION BEFORE RESUMING OR COMMENCING WORK ON THE DISCREPANCY ITEM.

7. DIMENSIONS TAKE PRECEDENCE OVER SCALE.

8. THE STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES INCLUDE, BUT ARE NOT LIMITED TO, BRACING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, WIND, SEISMIC, ETC. OBSERVATION VISITS TO THE SITE BY THE OIC SHALL NOT INCLUDE INSPECTION OF THE ABOVE ITEMS.

9. ALL MATERIALS SHALL CONFORM TO THE DRAWING AND SPECIFICATIONS.

10. THE CONTRACTOR SHALL COORDINATE THE STORAGE OF HIS MATERIAL WITH THE OIC.

11. RESTRICT ALL VEHICLES, MATERIAL STOCKPILES AND EQUIPMENT TO WITHIN THE CONTRACT LIMIT LINES. ANY TOOLS, MATERIALS, EQUIPMENT, FENCING, ETC. THAT THE CONTRACTOR KEEPS IN THIS AREA ARE STORED AT THE CONTRACTOR'S RISK. IF OTHER SHORT TERM STORAGE AREAS ARE NEEDED, THEY MAY BE ARRANGED THROUGH THE OIC

12. NO CONSTRUCTION EQUIPMENT SHALL BE PARKED WITHIN THE FACILITY ROADWAYS IN SUCH A MANNER THAT THE EQUIPMENT WILL OBSTRUCT THE NORMAL MOVEMENT AND SIGHT DISTANCE OF THE DRIVING MOTORIST, EXCEPT DURING ACTUAL WORKING HOURS.

13. DAMAGE OUTSIDE THE CONTRACT ZONE LIMITS AS A RESULT OF CONSTRUCTION OPERATIONS SHALL BE RESTORED TO ITS ORIGINAL, BETTER CONDITION. SUCH RESTORATION SHALL BE TO THE SATISFACTION OF THE OIC.

14. ALL WORK CALLED FOR ON THE PLANS AND NOT ITEMIZED IN THE PROPOSAL AND ALL WORK NOT CALLED FOR BUT REQUIRED FOR THE CONSTRUCTION OF THIS PROJECT, SHALL BE CONSIDERED INCIDENTAL.

15. CONDITIONS OF THE WORK: ALL WORK SHALL BE PERFORMED IN A PROFESSIONAL AND WORKMANSHIP-LIKE MANNER. CONTRACTOR SHALL NOTIFY THE OIC SHOULD CONDITIONS EXIST WHICH WILL PREVENT SUCH PERFORMANCE AND/OR ANY ADDITIONAL WORK TO BE PERFORMED BEFORE STARTING WORK.

16. EXISTING TOPOGRAPHIC DATA WAS TAKEN FROM TOPOGRAPHIC MAP PREPARED BY PAREN, INC. (DBA PARK ENGINEERING), DATED MARCH 18, 2010.

WATER POLLUTION CONTROL NOTES

GENERAL:

1. THE CONTRACTOR IS REMINDED OF THE REQUIREMENTS OF SECTION 209 – WATER POLLUTION AND EROSION CONTROL, IN THE "HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION". SECTION 209 DESCRIBES BUT IS NOT LIMITED TO: SUBMITTAL REQUIREMENTS; SCHEDULING OF A WATER POLLUTION AND EROSION CONTROL CONFERENCE WITH THE OIC; CONSTRUCTION REQUIREMENTS; METHOD OF MEASUREMENT; AND BASIS OF PAYMENT.

2. THE CONTRACTOR SHALL FOLLOW THE GUIDELINES IN THE "BEST MANAGEMENT PRACTICES MANUAL FOR CONSTRUCTION SITES IN HONOLULU", DATED MAY 1999 IN DEVELOPING, INSTALLING AND MAINTAINING THE BEST MANAGEMENT PRACTICES (BMP) FOR THE PROJECT.
   HTTP://WWW.CLEANWATERHONOLULU.COM/REPORTS/BMP_MANUAL.PDF

WATER POLLUTION CONTROL NOTES (CONT.)

3. THE OIC MAY ASSESS LIQUIDATED DAMAGES OF UP TO $25,000 FOR NONCOMPLIANCE OF EACH BMP REQUIREMENT AND EACH REQUIREMENT STATED IN SECTION 209, FOR EVERY DAY OF NON-COMPLIANCE. THERE IS NO MAXIMUM LIMIT ON THE AMOUNT ASSESSED PER DAY.

4. THE OIC WILL DEDUCT THE COST FROM THE PROGRESS PAYMENT FOR ALL CITATIONS RECEIVED BY THE DEPARTMENT FOR NONCOMPLIANCE, OR THE CONTRACTOR SHALL REIMBURSE THE STATE FOR THE FULL AMOUNT OF THE OUTSTANDING COST INCURRED BY THE STATE.

WASTE DISPOSAL:

1. WASTE MATERIALS – ALL WASTE MATERIALS SHALL BE COLLECTED AND DISPOSED OF PROPERLY BY END OF CONSTRUCTION. NO CONSTRUCTION WASTE MATERIALS SHALL BE BURIED ONSITE. THE CONTRACTOR'S SUPERVISORY PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL. NOTICES STATING THESE PRACTICES SHALL BE POSTED IN THE OFFICE TRAILER AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEEING THAT THESE PROCEDURES ARE FOLLOWED.

2. HAZARDOUS WASTE – ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATION OR BY THE MANUFACTURER. THE CONTRACTOR'S SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES AND SHALL BE RESPONSIBLE FOR SEEING THAT THESE PRACTICES ARE FOLLOWED. CLEAN CONCRETE SPOILS MAY BE DEPOSITED IN NELHA DESIGNATED SPOILS AREA. ALL CONCRETE SPOILS MUST BE CLEANED OF REBAR, METAL FASTENERS, ETC. BEFORE DEPOSITING IN NELHA SPOILS AREAS.

3. SANITARY WASTE – ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK, OR AS REQUIRED.

GOOD HOUSEKEEPING BEST MANAGEMENT PRACTICES:

1. MATERIALS POLLUTION PREVENTION PLAN

   A. APPLICABLE MATERIALS OR SUBSTANCES LISTED BELOW ARE EXPECTED TO BE PRESENT ONSITE DURING CONSTRUCTION. OTHER MATERIALS AND SUBSTANCES NOT LISTED BELOW SHALL BE ADDED TO THE INVENTORY.

DETERGENTS	PETROLEUM BASED PRODUCTS
PAINTS (ENAMEL AND LATEX)	CLEANING SOLVENTS
METAL STUDS	WOOD
CONCRETE	

   B. MATERIAL MANAGEMENT PRACTICES SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES TO STORM WATER RUNOFF. STORE ONLY ENOUGH PRODUCT AS IS REQUIRED TO DO THE JOB.

   C. ALL MATERIALS STORED ONSITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR APPROPRIATE CONTAINERS AND IF POSSIBLE UNDER A ROOF OR OTHER ENCLOSURE.

   D. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS WITH THE ORIGINAL MANUFACTURER'S LABEL.

   E. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.

   F. WHENEVER POSSIBLE, A PRODUCT SHALL BE USED UP COMPLETELY BEFORE DISPOSING OF THE CONTAINER.

   G. MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED.

   H. THE CONTRACTOR SHALL CONDUCT A DAILY INSPECTION TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS ON SITE.

2. HAZARDOUS MATERIAL POLLUTION PREVENTION PLAN

   A. PRODUCTS SHALL BE KEPT IN ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE.

   B. ORIGINAL LABELS AND MATERIAL SAFETY DATA SHEETS (MSDS) SHALL BE RETAINED.

   C. SURPLUS PRODUCTS SHALL BE DISPOSED OF ACCORDING TO MANUFACTURERS' INSTRUCTIONS OR LOCAL AND STATE RECOMMENDED METHODS.

3. ONSITE AND OFF SITE PRODUCT SPECIFIC PLAN

   A. THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ONSITE:

   1) PETROLEUM BASED PRODUCTS – ALL ONSITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED.

WATER POLLUTION CONTROL NOTES (CONT.)

   2) CONCRETE TRUCKS –

      a. CONCRETE TRUCKS SHALL BE ALLOWED TO WASH OUT OR DISCHARGE DRUM WASH WATER ONLY AT SITE DESIGNATED BY OIC. WATER SHALL NOT BE DISCHARGED IN THE STREAMS. THE CONTRACTOR SHALL CONTACT DRINKING WATER BRANCH, DEPARTMENT OF HEALTH AT 586-4258 TO RECEIVE PERMISSION TO DESIGNATE A DISPOSAL SITE. THE CONTRACTOR SHALL CLEAN DISPOSAL SITE AS REQUIRED OR AS REQUESTED BY THE OWNER'S REPRESENTATIVE.

      b. THE CONCRETE WASH WATER SHALL BE CONTAINED IN A PIT WITH AN IMPERMEABLE LINER TO PREVENT ANY INFILTRATION. A BERM SHALL BE CONSTRUCTED AROUND THE PIT TO PREVENT OVERFLOW OF WASH WATER AND THE ENTRY OF STORM WATER RUNOFF. THE PIT SHALL ALSO BE LARGE ENOUGH TO CONTAIN THE ANTICIPATED VOLUME OF WASH WATER.

4. SPILL CONTROL PLAN

   A. A SPILL PREVENTION PLAN SHALL BE POSTED AND ADJUSTED TO INCLUDE A DESCRIPTION AND CAUSE OF EACH SPILL, MEASURES TO PREVENT AND CLEAN UP EACH SPILL.

   B. THE CONTRACTOR SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR. THE CONTRACTOR SHALL DESIGNATE AT LEAST THREE SITE PERSONNEL WHO SHALL RECEIVE SPILL PREVENTION AND CLEANUP TRAINING. THESE INDIVIDUALS SHALL EACH BECOME RESPONSIBLE FOR A PARTICULAR PHASE OF PREVENTION AND CLEANUP. THE NAMES OF RESPONSIBLE SPILL PERSONNEL SHALL BE POSTED IN THE MATERIAL STORAGE AREA AND IN THE OFFICE TRAILER ONSITE.

   C. MANUFACTURERS' RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES.

   D. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ONSITE.

   E. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY. NOTIFY OIC IMMEDIATELY OF ALL SPILLS.

   F. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.

   G. SPILLS OF TOXIC HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY, REGARDLESS OF THE SIZE.

GRADING NOTES

1. ALL GRADING WORK SHALL BE DONE IN ACCORDANCE WITH CHAPTER 14, ARTICLES 13, 14, 15 AND 16, AS RELATED TO GRADING, SOIL EROSION AND SEDIMENT CONTROL OF THE REVISED ORDINANCES OF HONOLULU, 1990.

2. THE CONTRACTOR SHALL COMPLY WITH NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REQUIREMENTS. THE CONTRACTOR SHALL NOT START CONSTRUCTION UNTIL NOTICE OF GENERAL PERMIT COVERAGE (NGPC) IS RECEIVED FROM THE DEPARTMENT OF HEALTH, STATE OF HAWAII AND HAS SATISFIED ANY OTHER APPLICABLE REQUIREMENTS OF THE NPDES PERMIT PROGRAM.

3. NO CONTRACTOR SHALL PERFORM ANY GRADING OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.

4. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS CONTAINED IN THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 60.1, "AIR POLLUTION CONTROL".

5. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.

6. ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SURFACE WATERS FROM DAMAGING THE CUT FACE OF AN EXCAVATION OR THE SLOPED SURFACES OF A FILL. FURTHERMORE, ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE SITE.

GRADING NOTES

7. ALL SLOPES AND EXPOSED AREAS SHALL BE SODDED OR PLANTED AS SOON AS FINAL GRADES HAVE BEEN ESTABLISHED. PLANTING SHALL NOT BE DELAYED UNTIL ALL GRADING WORK HAS BEEN COMPLETED. GRADING TO FINAL GRADE SHALL BE CONTINUOUS, AND ANY AREA WITHIN WHICH WORK HAS BEEN INTERRUPTED OR DELAYED SHALL BE PLANTED.

8. FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.

9. PROJECT WHEN THE APPLICATION FOR A GRADING PERMIT IS MADE. THE BORROW/DISPOSAL SITE MUST ALSO FULFILL THE REQUIREMENTS OF THE GRADING ORDINANCE.

10. NO GRADING WORK SHALL BE DONE ON SATURDAYS, SUNDAYS AND HOLIDAYS AT ANY TIME WITHOUT PRIOR NOTICE TO THE DIRECTOR, D.P.P., PROVIDED SUCH GRADING WORK IS ALSO IN CONFORMANCE WITH THE COMMUNITY NOISE CONTROL STANDARDS CONTAINED IN THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 46, "COMMUNITY NOISE CONTROL".

11. PURSUANT TO CHAPTER 6E, HRS, IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE HONOLULU POLICE DEPARTMENT, THE STATE DEPARTMENT OF LAND AND NATURAL RESOURCES-HISTORIC PRESERVATION DIVISION (692-8015). IN ADDITION, FOR NON-CITY PROJECTS, THE CONTRACTOR SHALL INFORM THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING (768-8084); AND FOR CITY PROJECTS, NOTIFY THE RESPONSIBLE CITY AGENCY.

12. THE LIMITS OF THE AREA TO BE GRADED SHALL BE FLAGGED BEFORE THE COMMENCEMENT OF THE GRADING WORK.

13. ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS", AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL", AND IF APPLICABLE, THE NPDES PERMIT FOR THE PROJECT.

14. WHERE APPLICABLE AND FEASIBLE THE MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY EARTH MOVING PHASE OF THE GRADING IS INITIATED.

15. TEMPORARY EROSION CONTROLS SHALL NOT BE REMOVED BEFORE PERMANENT EROSION CONTROLS ARE IN-PLACE AND ESTABLISHED.

16. TEMPORARY EROSION CONTROL PROCEDURES SHALL BE SUBMITTED FOR APPROVAL PRIOR TO APPLICATION FOR GRADING PERMIT.

17. IF THE GRADING WORK INVOLVES CONTAMINATED SOIL, THEN ALL GRADING WORK SHALL BE DONE IN CONFORMANCE WITH APPLICABLE STATE AND FEDERAL REQUIREMENTS.

REVISION NO.	SYM.	DESCRIPTION	SHT.___ OF.___	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

NOTES

oceanit

DESIGNED BY: AK	CHECKED BY: DE	DAGS JOB NO. 15-23-7409	DRAWING NO. T-2
DRAWN BY: AK	APPROVED BY:	DATE MAY 2010	SHEET 2 OF 11 SHTS
SCALE: AS NOTED			

DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\02_03_NOTES.DWG EDIT TIME: 05-10-10, 9:43 AM EDITED BY: AKEANE

FILE_____ DRAWER_____ FOLDER_____

PUBLIC HEALTH SAFETY AND CONVENIENCE NOTES

1. CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL QUALITY.

2. THE CONTRACTOR AT HIS/HER EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM RUBBISH, DUST, NOISE, EROSION, ETC. THE WORK SHALL BE DONE IN CONFORMANCE WITH THE AIR AND WATER POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.

3. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SILT OR DEBRIS IN ANY FORM TO FALL SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATION OCCUR, THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS AS NECESSARY.

4. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC.

5. THE CONTRACTOR SHALL CONTROL ACCESS TO ALL OPENINGS TO PREVENT UNAUTHORIZED ENTRY UNDERGROUND. UNUSED CHUTES, MANWAYS, OR OTHER OPENINGS SHALL BE TIGHTLY COVERED, BULKHEADED, OR FENCED OFF, AND SHALL BE POSTED WITH WARNING SIGNS INDICATING "KEEP OUT" OR SIMILAR LANGUAGE. COMPLETED OR UNUSED SECTIONS OF THE UNDERGROUND FACILITY SHALL BE BARRICADED.

6. THE CONTRACTOR'S ATTENTION IS DIRECTED TO CHAPTER 46, PUBLIC HEALTH REGULATIONS, DEPARTMENT OF HEALTH, STATE OF HAWAII, "COMMUNITY NOISE CONTROL," IN WHICH MAXIMUM PERMISSIBLE NOISE LEVELS HAVE BEEN SET. IF THE CONSTRUCTION WORK REQUIRES A PERMIT FROM THE DIRECTOR OF HEALTH, THE CONTRACTOR SHALL OBTAIN A COPY OF CHAPTER 46 AND BECOME FAMILIAR WITH THE NOISE LEVEL RESTRICTIONS AND THE PROCEDURES FOR OBTAINING A PERMIT FOR THE CONSTRUCTION ACTIVITIES. APPLICATION AND INFORMATION ON VARIANCES ARE AVAILABLE FROM THE ENVIRONMENTAL PROTECTION AND HEALTH SERVICES DIVISION, 1250 PUNCHBOWL ST., HONOLULU, HI 96813 OR BY TELEPHONE (548-6455).

SEQUENCE OF CONSTRUCTION

1. LOWER WATER LEVEL IN KOLEA RESERVIOR TO BOTTOM.
2. INSTALL REQUIRED TEMPORARY EROSION CONTROL ITEMS.
3. INSTALL TEMPORARY STORM WATER BYPASS BERM, SIPHON AND DRAIN LINES.
4. CONSTRUCT DAM BREACH AND EMBANKMENT FILL.
5. INSTALL GROUTED RIPRAP TO DAM BREACH CHANNEL AS REQUIRED.
6. INSTALL PERMANENT EROSION CONTROL ITEMS.
7. REMOVE TEMPORARY STROM WATER BYPASS ITEMS.
8. REMOVE TEMPORARY EROSION CONTROL ITEMS.

REVISION NO.	SYM.	DESCRIPTION	SHT.___ OF___	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

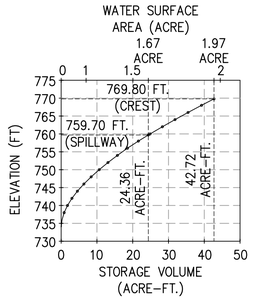
DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

NOTES

oceanit	DAGS JOB NO.	DRAWING NO.
DESIGNED BY: AK / CHECKED BY: DE	15-23-7409	T-3
DRAWN BY: AK / APPROVED BY:	DATE: MAY 2010	SHEET 3 OF 11 SHTS
SCALE: AS NOTED		

DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\02_03_NOTES.DWG EDIT TIME: 05-10-10, 9:44 AM EDITED BY: AKEANE

FILE_____ DRAWER_____ FOLDER_____



KOLEA RESERVOIR: ELEVATION VS. AREA/STORAGE VOLUME RATING CURVE

TRUE NORTH
SCALE: 1 In. = 20 Ft.

"I" CUT ON ROCK KOL-4
ELEV=756.53
FB 2924/9

186° 24' 37" 299.94 ("I"cut on rock KOL-4 to Pipe w/cap KOL-1)

(Pipe w/cap KOL-2 to "I" cut on rock KOL-4) 12° 21' 20" 501.10

(Pipe w/cap KOL-1 to Pipe w/cap KOL-2) 201° 03' 59" 205.14

PIPE W/ CAP KOL-1
ELEV=771.36
FB 2924/1,11

PIPE W/ CAP KOL-3
ELEV=761.30
FB 2924/8

EXIST. ROCK CUT RESERVOIR SPILLWAY

EXIST. 36-INCH ø CAST IRON PIPE. OUTLET WORKS DISCHARGE INV.= 712.42

EXIST. VALVE CONTROL WHEEL

EXIST. WOODEN PIER & FLOW CONTROL VALVE

EXIST. GRATED DRAIN INLET

DAM CREST / ACCESS ROAD

KOLEA RESERVOIR

BENCH MARK
PIPE W/ CAP KOL-2
ELEV=770.84
FB 2924/15

NOTES:

1. UNDERGROUND PUBLIC UTILITIES SHOWN HEREON ARE FOR INFORMATION ONLY. NO GUARANTEE IS MADE ON THE ACCURACY OR COMPLETENESS OF SAID INFORMATION.
2. ALL AZIMUTHS SHOWN ARE REFERRED TO NAD83, HAWAII ZONE 2 STATE PLANE COORDINATE SYSTEM. TO CONVERT STATE PLANE AZIMUTHS TO AZIMUTHS REFERRED TO GOVERNMENT SURVEY TRIANGULATION STATION "HANAWI 1877", MINUS (–) 0° 12' 03.6".
3. ELEVATIONS OBTAINED FROM GPS OVSERVATIONS AND GEOID MODEL, GEOID 99 (HAWAII).

DATE: MARCH 18, 2010
FIELD BOOK NO. 2924
TAX MAP KEY: 1–1–01:Por.50, DIVISION 2

LEGEND:

1980' EXISTING CONTOUR

DIRECTION OF SURFACE DRAINAGE

GRAPHIC SCALE:

20' 10' 0 20' 40'

SCALE: 1" = 20'

EXISTING SITE PLAN

SCALE: 1" = 20'–0"

IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

REVISION NO.	SYM.	DESCRIPTION	SHT.__ OF__	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1–1–01:50
HAIKU, MAUI, HAWAII

EXISTING SITE PLAN

oceanit

DESIGNED BY: —	CHECKED BY: —	DAGS JOB NO. 15-23-7409	DRAWING NO. EG-1
DRAWN BY: AK	APPROVED BY:	DATE MAY 2010	SHEET 4 OF 11 SHTS
SCALE: AS NOTED			

DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\04_EXIST_PLAN.DWG EDIT TIME: 05-10-10, 9:44 AM EDITED BY: AKEANE

FILE.....DRAWER.....FOLDER.....

TRUE NORTH
SCALE: 1 In. = 20 Ft.

"1" CUT ON ROCK KOL-4
ELEV=756.53
FB 2924/9

PIPE W/ CAP KOL-3
ELEV=761.30
FB 2924/8

PIPE W/ CAP KOL-1
ELEV=771.36
FB 2924/1,11

CAP AND PLUG EXIST. 36-INCH ø DRAIN FOLLOWING COMPLETION OF DAM BREACH CONSTRUCTION

FOLLOWING COMPLETION OF DAM BREACH CONSTRUCTION SECURE VALVE IN CLOSED POSITION AND CUT AND REMOVE EXIST. CONTROL WHEEL.

DEMO AND REMOVE EXIST. WOODEN PIER AND WOOD RAILING. CUT EXIST. DRAIN LINE UPSTREAM OF EXIST. VALVE. REMOVE EXIST. VALVE.

DEMO AND REMOVE EXIST. INLET GRATE

BENCH MARK
PIPE W/ CAP KOL-2
ELEV=770.84
FB 2924/15

186° 24' 37" 299.94 ("1" cut on rock KOL-4 to Pipe w/cap KOL-1)

12° 21' 20" 501.10 (Pipe w/cap KOL-2 to "1" cut on rock KOL-4)

201° 03' 59" 205.14 (Pipe w/cap KOL-1 to Pipe w/cap KOL-2)

LEGEND:

1980 EXISTING CONTOUR

REMOVE EXISTING STRUCTURES AND APPURTENANCES

GRAPHIC SCALE:

20' 10' 0 20' 40'

SCALE: 1" = 20'

DEMOLITION PLAN

SCALE: 1" = 20'-0"

IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

REVISION NO.	SYM.	DESCRIPTION	SHT.__ OF__	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

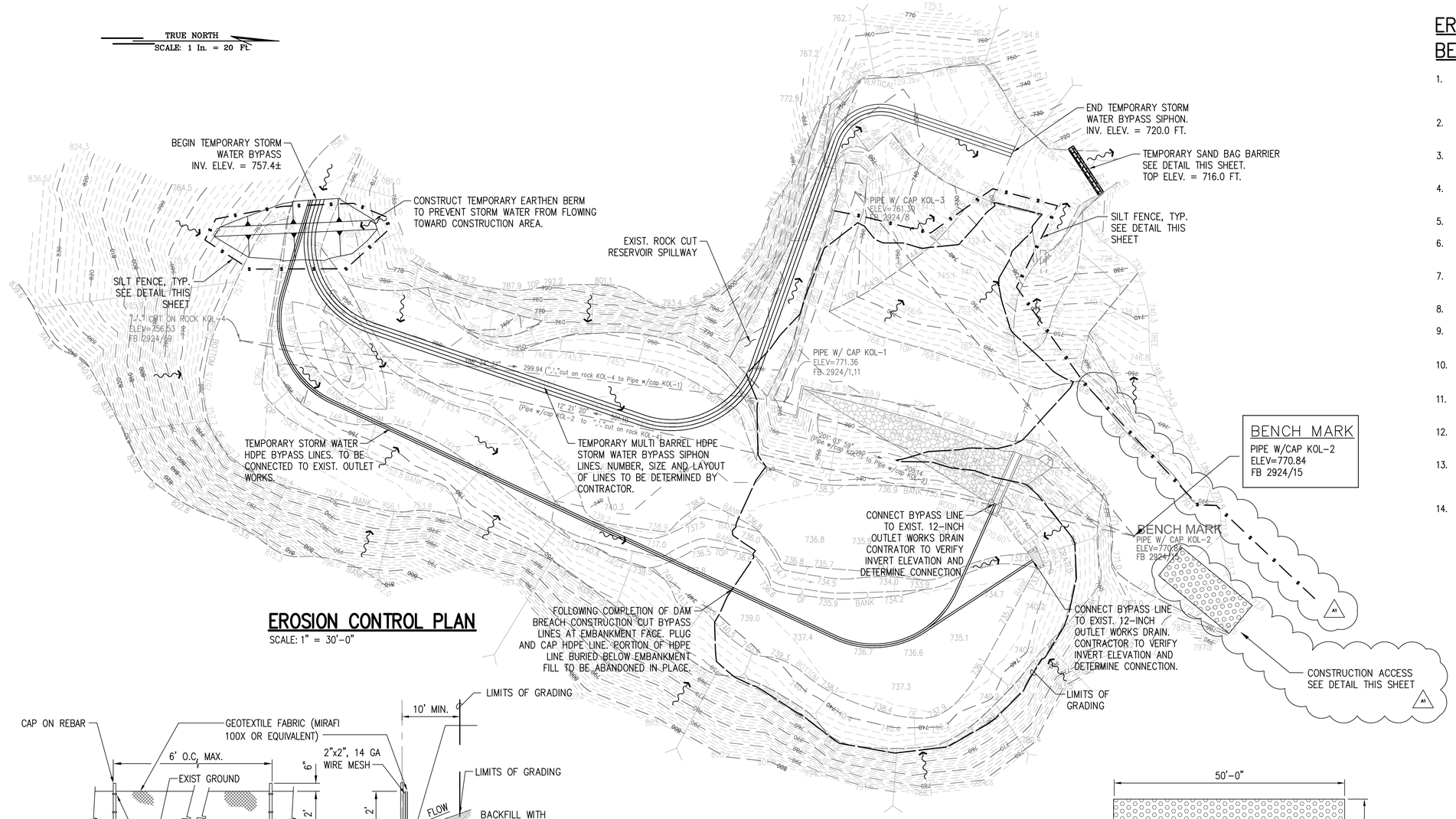
DEMOLITION PLAN

oceanit

DESIGNED BY: AK	CHECKED BY: DE	DAGS JOB NO. 15-23-7409	DRAWING NO. EG-2
DRAWN BY: AK	APPROVED BY:	DATE MAY 2010	SHEET 5 OF 11 SHTS
SCALE: AS NOTED			

DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\05_DEMO_PLAN.DWG EDIT TIME: 05-10-10, 9:45 AM EDITED BY: AKEANE

FILE.....DRAWER.....FOLDER.....



EROSION CONTROL PLAN

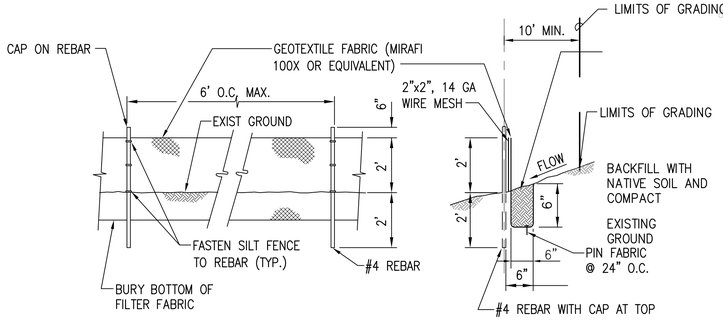
SCALE: 1" = 30'-0"

EROSION CONTROL NOTES AND BEST MANAGEMENT PRACTICES (BMPS):

1. MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY EARTH MOVING WORK IS INITIATED. THESE MEASURES SHALL BE PROPERLY CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
2. LIQUID SOIL STABALIZER SHALL BE DIRTGLUE POLYMER EMULSIONS BY DIRTGLUE ENTERPRISES OR EQUAL.
3. LIQUID SOIL STABILIZATION SHALL BE RE-APPLIED AT THE END OF EACH WORK DAY WHEN SURFACE OF EXISTING SOIL STABILIZER IS DISTURBED.
4. CONSTRUCTION SHALL BE SEQUENCED TO MINIMIZE THE EXPOSURE TIME OF CLEARED SURFACE AREA.
5. ALL CONTROL MEASURES SHALL BE CHECKED AND REPAIRED AS NECESSARY.
6. CONSTRUCT FACILITIES TO RETAIN ON-SITE WASTEWATER SUCH AS CHLORINATED WATER, HYDROSTATIC TESTING WATER, ETC, AND PERCOLATE INTO THE SOIL.
7. MAINTAIN SEDIMENT TRAPS AT DISCHARGE POINTS DURING SITE WORK AND UNTIL PERMANENT EROSION CONTROLS ARE IN PLACE.
8. CONSTRUCT CONSTRUCTION ACCESS FOR EACH INGRESS AND EGRESS.
9. PRE-CONSTRUCTION VEGETATIVE GROUND COVER SHALL NOT BE DESTROYED, REMOVED OR DISTURBED MORE THAN TWENTY (20) CALENDAR DAYS PRIOR TO SITE DISTURBANCE.
10. TEMPORARY SOIL STABILIZATION WITH APPROPRIATE VEGETATION SHALL BE APPLIED ON AREAS THAT WILL REMAIN UNFINISHED FOR MORE THAN THIRTY (30) CALENDAR DAYS.
11. PERMANENT SOIL STABILIZATION WITH PERENNIAL VEGETATION SHALL BE APPLIED AS SOON AS PRACTICAL AFTER FINAL GRADING.
12. STORM WATER FLOWING TOWARD THE CONSTRUCTION AREA SHALL BE DIVERTED BY USING APPROPRIATE CONTROL MEASURES AS PRACTICAL.
13. THE SUGGESTED STORM WATER BYPASSING PLAN IS SCHEMATIC ONLY. THE CONTRACTOR IS WHOLLY RESPONSIBLE FOR THE DETERMINATION OF ADEQUACY, CONSTRUCTION SEQUENCE, AND RELATED BYPASSING REQUIRED FOR CONSTRUCTION OPERATIONS.
14. A TABLE SHOWING ESTIMATED STORM FLOWS FOR DIFFERENT STORM RECURRENCE INTERVALS IS PROVIDED ON THIS SHEET FOR THE CONTRACTOR'S CONVENIENCE IN SIZING OF STORM WATER BYPASS SYSTEM.

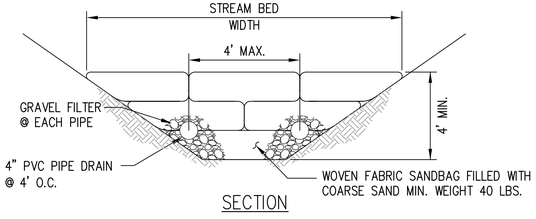
KOLEA RESERVOIR: ESTIMATED STORM FLOWS

RECURRANCE INTERVAL (YEARS)	1-HOUR RAINFALL (INCHES)	KOLEA RESERVOIR BASIN INFLOW (CU. FT./SEC)
100	6.03	1,342
50	5.43	1,194
25	4.83	1,045
10	4.05	853
5	3.48	675
2	2.73	441

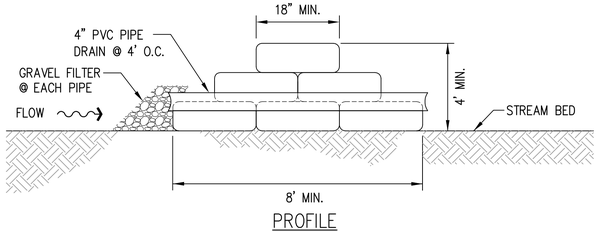


SILT FENCE DETAIL

NOT TO SCALE



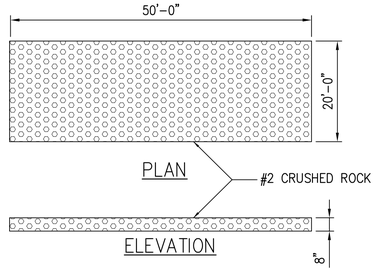
SECTION



PROFILE

SANDBAG BARRIER DETAIL

NOT TO SCALE



CONSTRUCTION ACCESS

NOT TO SCALE

LEGEND:

- 1980' — EXISTING CONTOUR
- LIMITS OF GRADING
- SILT FENCE (TEMPORARY)
- STORM WATER BYPASS SCHEMATIC (TEMPORARY)
- DIRECTION OF SURFACE DRAINAGE
- CONSTRUCTION ACCESS (TEMPORARY)
- SANDBAG BARRIER (TEMPORARY)

GRAPHIC SCALE:

30' 15' 0 30' 60'

SCALE: 1" = 30'

IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR
ADD-1	A1	EXTEND SILT FENCE	1 OF 2	6/09/10	
ADD-1	A1	RELOCATE CONSTRUCTION ACCESS GRAVEL PAD	1 OF 2	6/09/10	

DERRICK C. ELFALAN LICENSED PROFESSIONAL ENGINEER No. 5448-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION, "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

STREAM CHANNEL DIVERSION & EROSION CONTROL PLAN

oceanit

DESIGNED BY:	CHECKED BY:	DAGS JOB NO.	DRAWING NO.
AK	DE	15-23-7409	EC-1
DRAWN BY: AK	APPROVED BY:	DATE: MAY 2010	SHEET 6 OF 11 SHTS
SCALE: AS NOTED			

EARTHWORK SUMMARY:

(FOR GRADING PERMIT PURPOSES ONLY)

TOTAL EARTHWORK (DAM BREACH AND BASIN FILL):

AREA TO BE GRADED:	0.93 ACRE
CUT:	9,599 CY
FILL:	9,077 CY

THE CONTRACTOR SHALL CONDUCT HIS OWN QUANTITY SUMMARY

TRUE NORTH
SCALE: 1 In. = 20 Ft.

STA. 0+2.45
BEGIN BREACH CHANNEL
FG/EG 716.42

FG/EG 718.03

FG/EG 714.85

ROCK RIPRAP (GROUTED) FHWA FP 92 CLASS 4 W/GEOTEXTILE FABRIC.

ARMOR EXIST. STREAM BED WITH ROCK RIPRAP (GROUTED) FHWA FP 92 CLASS 4 W/GEOTEXTILE FABRIC.

LIMITS OF GRADING

FG 732.78
FG/EG 736.54

FG 732.78
FG/EG 735.85

INSTALL EROSION MATTING ALONG ALL EXPOSED 2:1 SLOPES

"J" CBT ON ROCK KOL-4
ELEV=756.53
FB 2924/9

CHECK DAMS IN LOW FLOW CHANNEL OF STREAM (TYP.)

186° 24' 37" → 299.94 ("J" cut on rock KOL-4 to Pipe w/cap KOL-1)

12° 21' 20" ← 501.10 (Pipe w/cap KOL-2 to "J" cut on rock KOL-4)

CHECK DAMS IN LOW FLOW CHANNEL OF STREAM (TYP.)

EXISTING RESERVOIR BASIN TO BE GRASSED EXCEPT ALONG STREAM CHANNEL

℄ BREACH CHANNEL

CHECK DAMS IN LOW FLOW CHANNEL OF STREAM (TYP.)

STA. 2+40
END BREACH CHANNEL
FG = 735.78

FG/EG 748.00

INSTALL EROSION MATTING ALONG ALL EXPOSED 2:1 SLOPES

FG/EG 755.00

UPPER REGION OF EMBANKMENT FILL TO BE GRASSED ALONG ALL EXPOSED 2% SLOPES

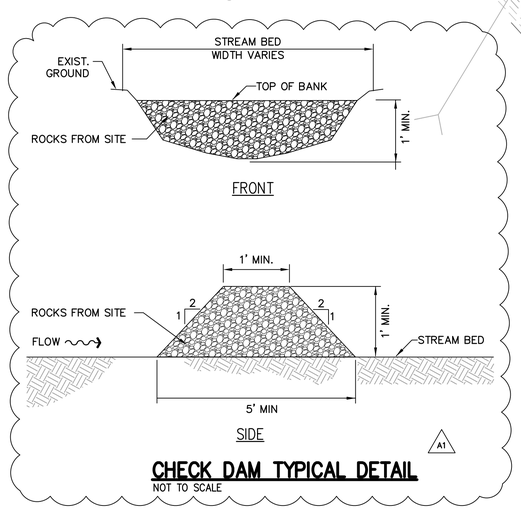
LIMITS OF GRADING

BENCH MARK
PIPE W/CAP KOL-2
ELEV=770.84
FB 2924/15

BENCH MARK
PIPE W/ CAP KOL-2
ELEV=770.84
FB 2924/15

SUMMARY OF PERMANENT EROSION CONTROL MEASURES:

AREA TO BE GRASSED (A1)	60,105 S.F. ~~39,605 S.F.~~
AREA TO BE COVERED BY EROSION MATTING	16,695 S.F.



CHECK DAM TYPICAL DETAIL
NOT TO SCALE

LEGEND:

1980	FINISHED CONTOUR
1980	EXIST. CONTOUR
— — —	LIMITS OF GRADING
----------	GRADE BREAK
Y	CUT/FILL SLOPE

GRAPHIC SCALE:

20' 10' 0 20' 40'

SCALE: 1" = 20'

GRADING PLAN

SCALE: 1" = 20'-0"

IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

REVISION NO.	SYM.	DESCRIPTION	SHT.__ OF__	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR
ADD-1	A1	CHECK DAMS ADDED	2 OF 2	6/10/10	
ADD-1	A1	ADDITIONAL PREMANMENT EROSION CONTROL GRASSED AREA	2 OF 2	6/10/10	

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

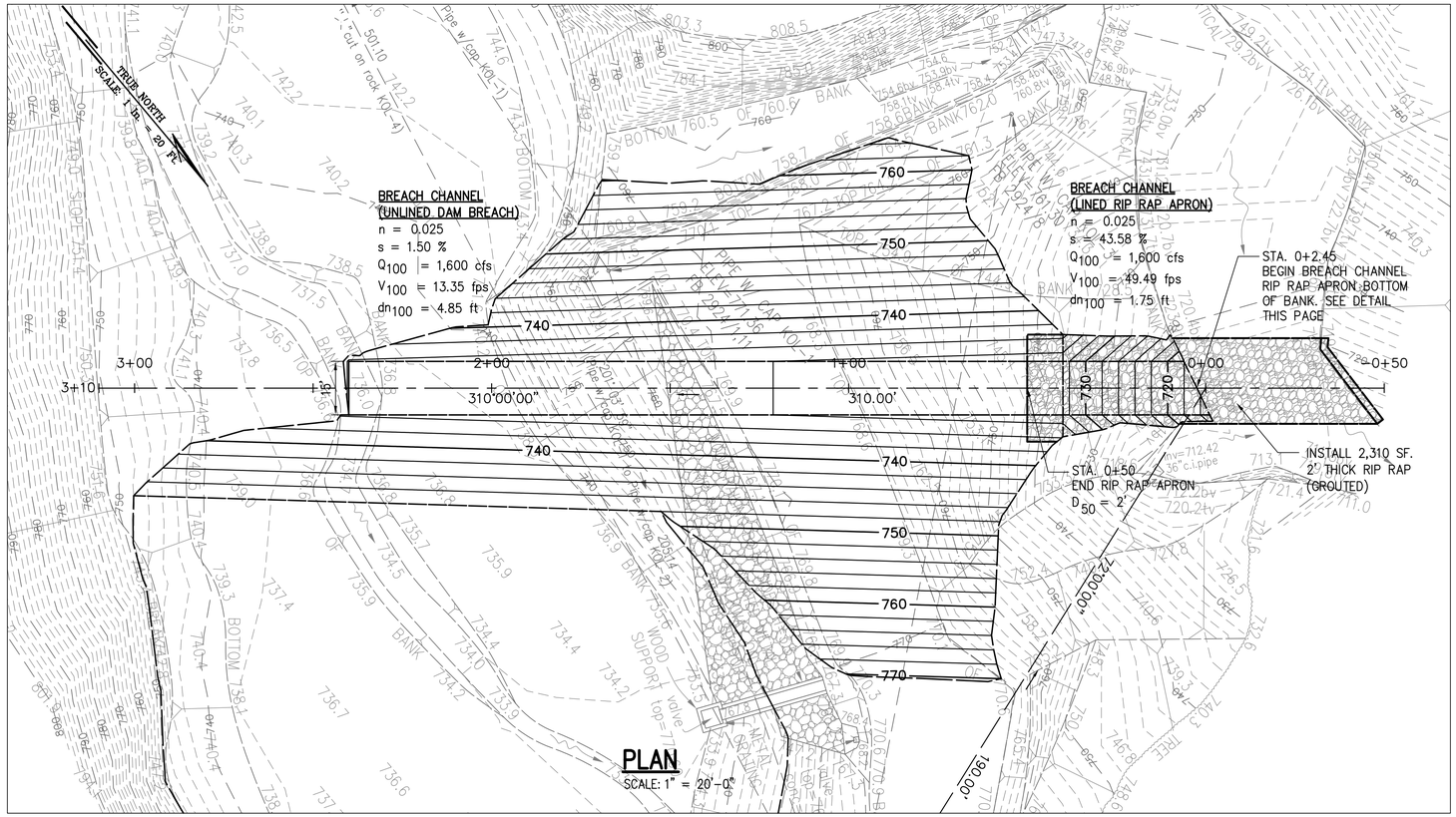
GRADING PLAN

oceanit

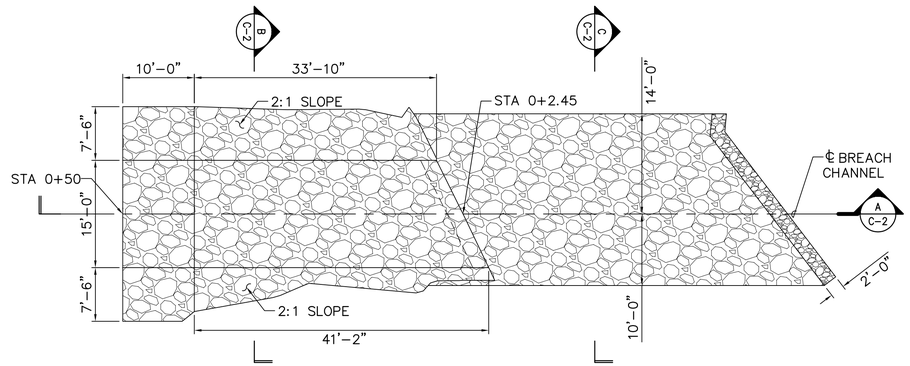
DESIGNED BY:	CHECKED BY:	DAGS JOB NO.	DRAWING NO.
AK	DE	15-23-7409	C-1
DRAWN BY: AK	APPROVED BY:	DATE: MAY 2010	SHEET 7 OF 11 SHTS
SCALE: AS NOTED			

DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\ADDENDUM_1\07_GRADING_PLAN.DWG EDIT TIME: 06-10-10, 8:44 AM EDITED BY: DELFALAN

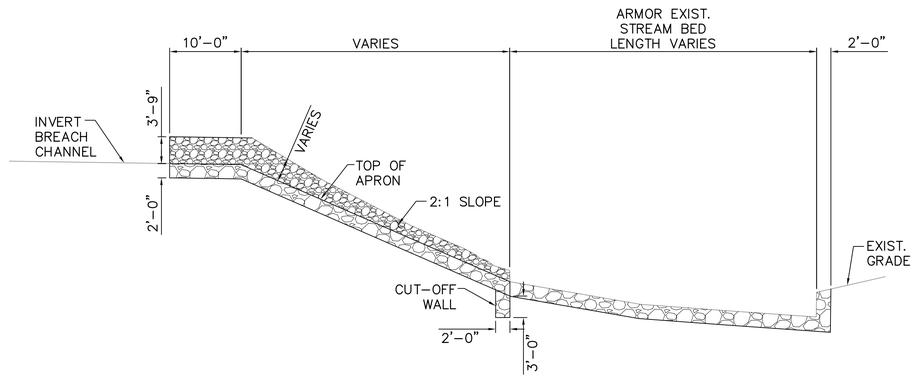
FILE..... DRAWER..... FOLDER.....



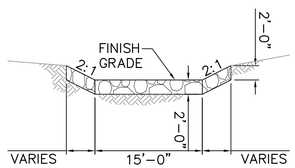
PLAN
SCALE: 1" = 20'-0"



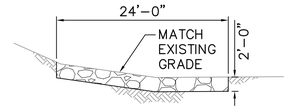
RIP RAP APRON DETAIL
SCALE: 1" = 10'



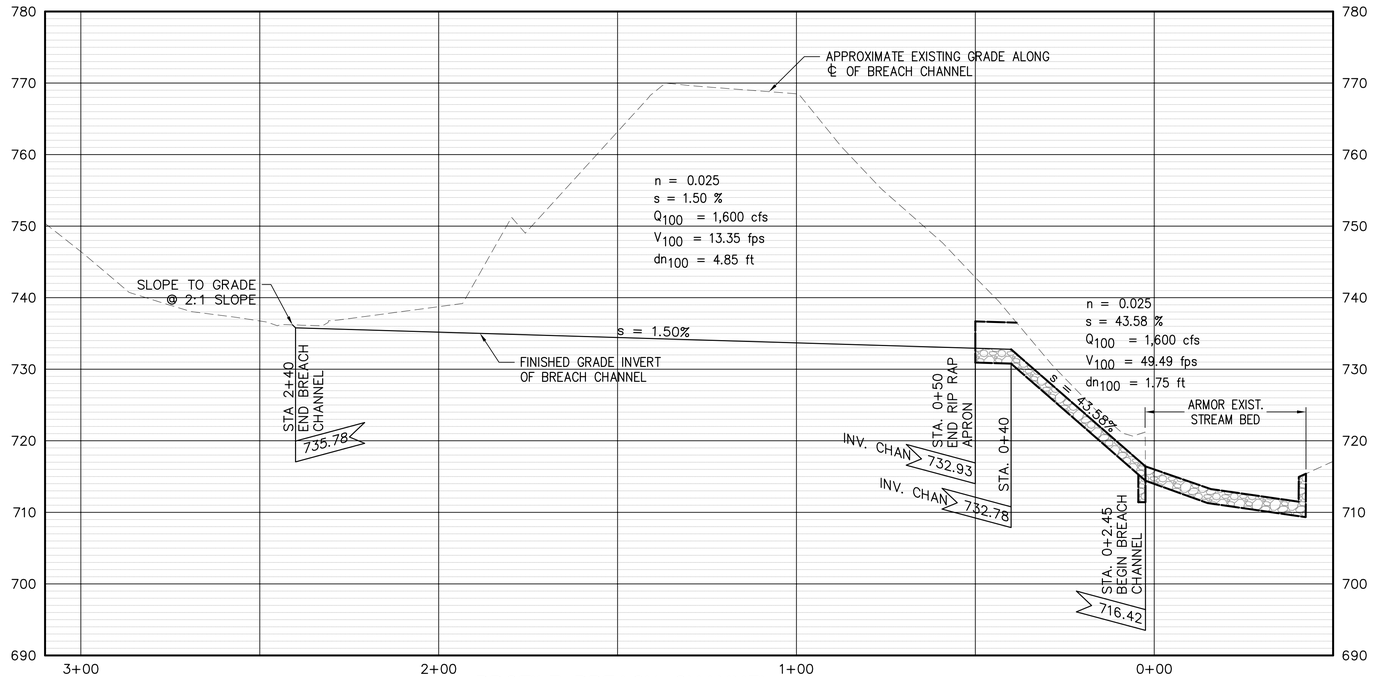
SECTION A



SECTION B



SECTION C



PROFILE BREACH CHANNEL
SCALE: HOR.: 1" = 20'-0"
VER.: 1" = 10'-0"

IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

GRAPHIC SCALE:

20' 10' 0 20' 40'
SCALE: 1" = 20'

10' 5' 0 10' 20'
SCALE: 1" = 10'

REVISION NO.	SYM.	DESCRIPTION	SHT.___ OF___	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

BREACH CHANNEL – PLAN & PROFILE

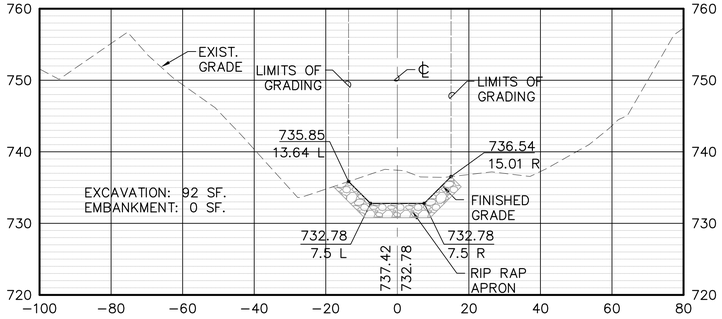
oceanit

DESIGNED BY:	CHECKED BY:	DAGS JOB NO.	DRAWING NO.
AK	DE	15-23-7409	C-2
DRAWN BY: AK	APPROVED BY:	DATE: MAY 2010	SHEET 8 OF 11 SHTS
SCALE: AS NOTED			

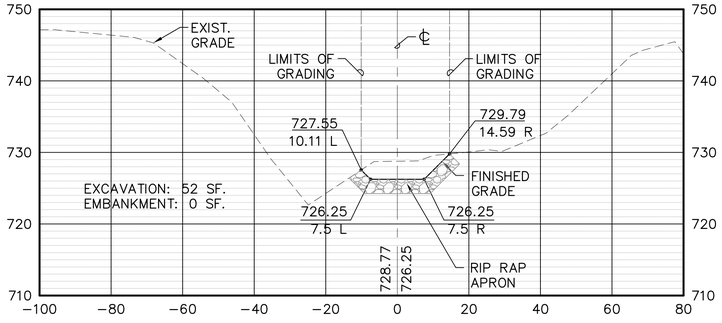
DRAWING NAME: I:\2009\39-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\08_ BREACH_PLAN_PROF.DWG EDIT TIME: 05-10-10, 9:46 AM EDITED BY: AKEANE

FILE..... DRAWER..... FOLDER.....

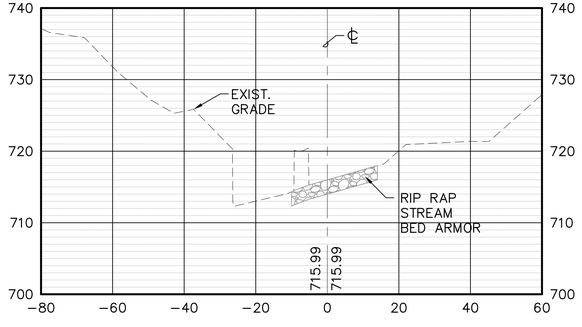
STA. 0+40



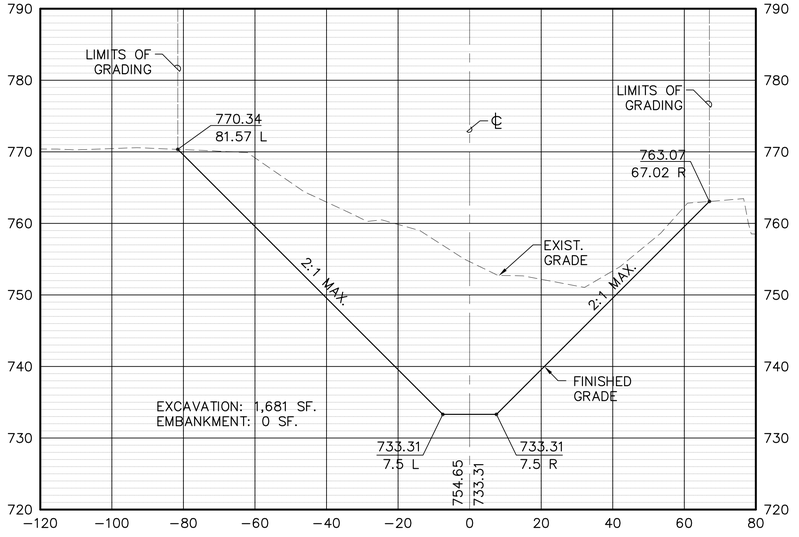
STA. 0+25



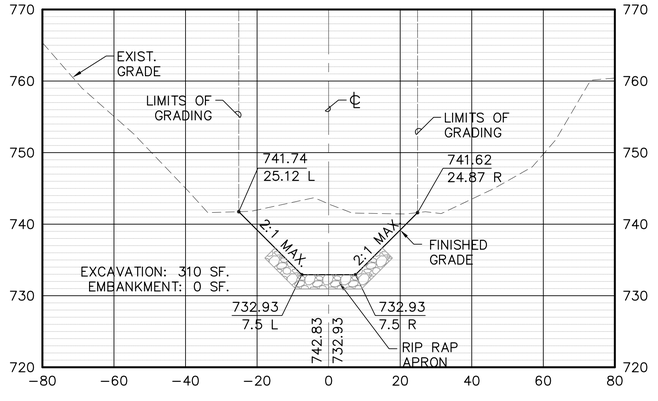
STA. 0+00



STA. 0+75



STA. 0+50



IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

GRAPHIC SCALE:

20' 10' 0 20' 40'

SCALE: 1" = 20'

10' 5' 0 10' 20'

SCALE: 1" = 10'

LEGEND:

- EXISTING GRADE
- FINISHED GRADE
- GROUTED RIP RAP
- ELEVATION ℄ OFFSET — SPOT ELEVATION CALLOUT

BREACH CHANNEL CROSS SECTIONS

SCALE: HOR.: 1" = 20'−0"
VER.: 1" = 10'−0"

REVISION NO.	SYM.	DESCRIPTION	SHT.___ OF___	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

BREACH CHANNEL – CROSS SECTIONS
STA. 0+00 TO 0+75

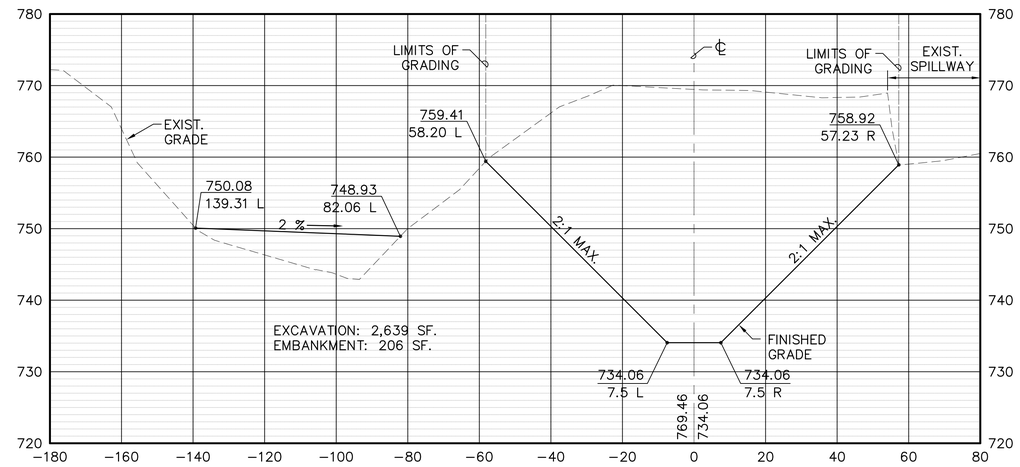
oceanit

DESIGNED BY:	CHECKED BY:	DAGS JOB NO.	DRAWING NO.
AK	DE	15-23-7409	C-3
DRAWN BY:	APPROVED BY:	DATE	SHEET
AK		MAY 2010	9
SCALE: AS NOTED			OF 11 SHTS

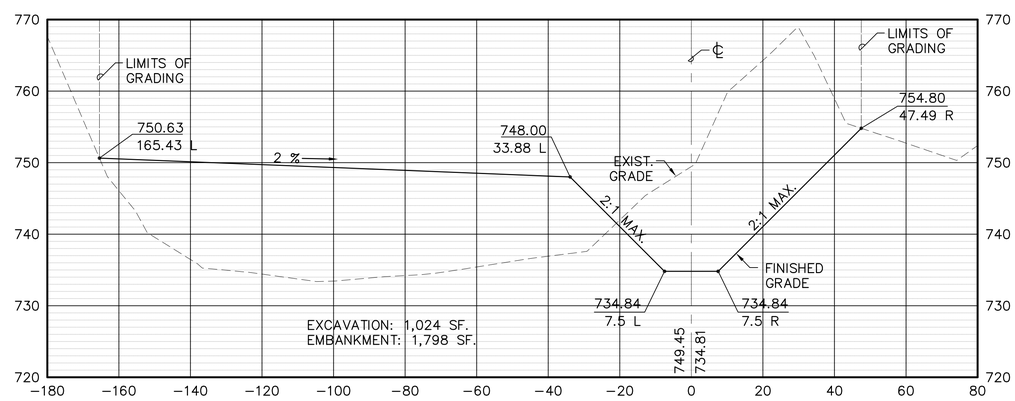
DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\09_SECTIONS.DWG EDIT TIME: 05-10-10, 9:47 AM EDITED BY: AKEANE

FILE..... DRAWER..... FOLDER.....

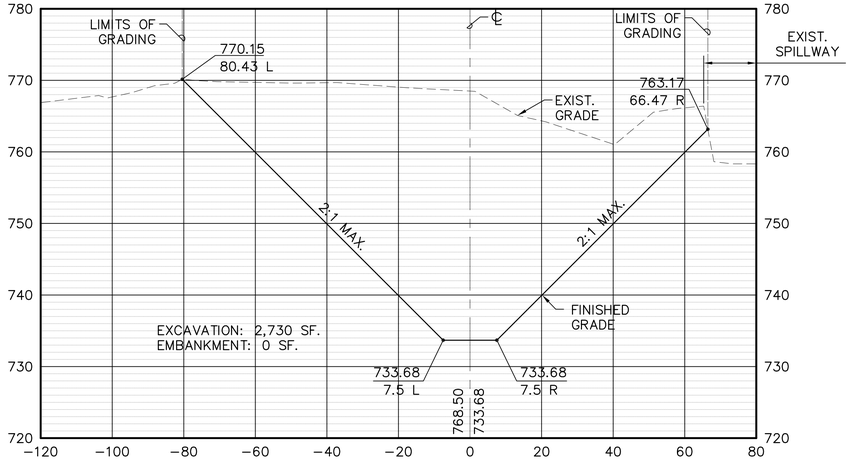
STA. 1+25



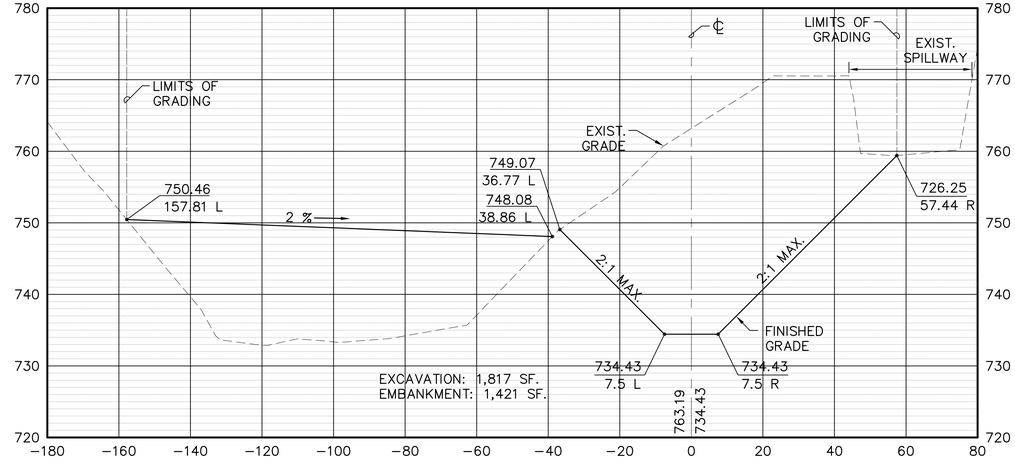
STA. 1+75



STA. 1+00



STA. 1+50



IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

GRAPHIC SCALE:

20' 10' 0 20' 40'

SCALE: 1" = 20'

10' 5' 0 10' 20'

SCALE: 1" = 10'

LEGEND:

EXISTING GRADE

FINISHED GRADE

ELEVATION
℄ OFFSET

SPOT ELEVATION CALLOUT

BREACH CHANNEL CROSS SECTIONS

SCALE: HOR.: 1" = 20'−0"
VER.: 1" = 10'−0"

REVISION NO.	SYM.	DESCRIPTION	SHT.__ OF__	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

BREACH CHANNEL – CROSS SECTIONS
STA. 1+00 TO 1+75

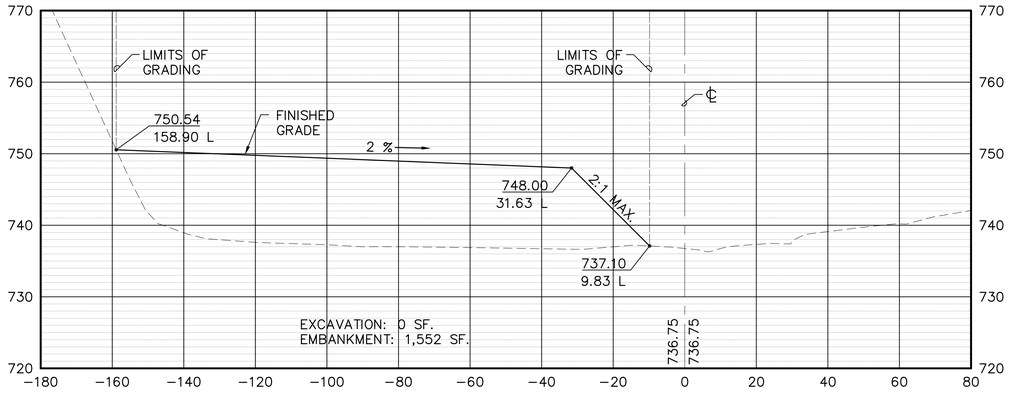
oceanit

DESIGNED BY: AK	CHECKED BY: DE	DAGS JOB NO. 15-23-7409	DRAWING NO. C-4
DRAWN BY: AK	APPROVED BY:	DATE MAY 2010	SHEET 10 OF 11 SHTS
SCALE: AS NOTED			

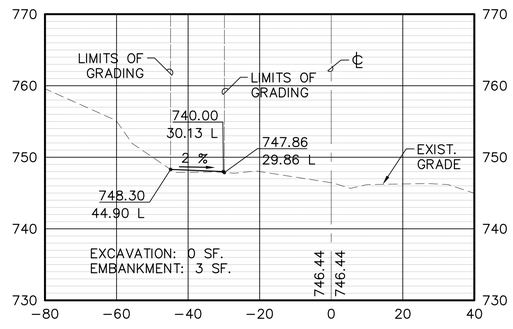
DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\09_SECTIONS.DWG EDIT TIME: 05-10-10, 9:47 AM EDITED BY: AKEANE

FILE..... DRAWER..... FOLDER.....

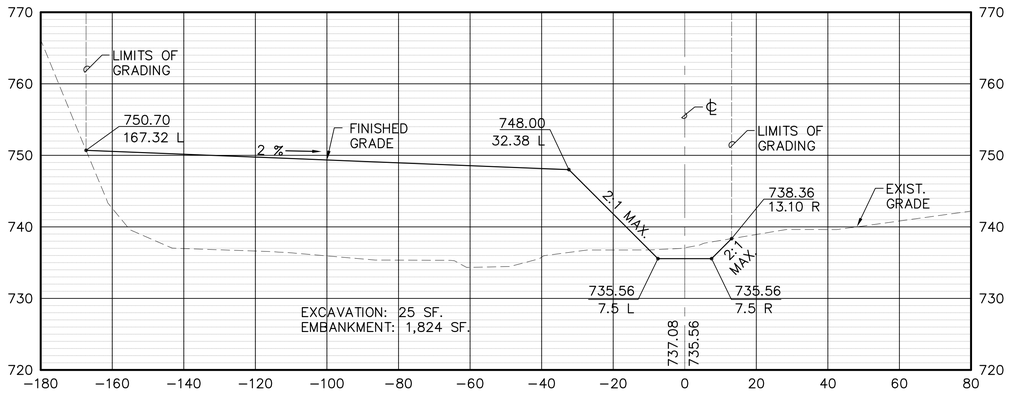
STA. 2+50



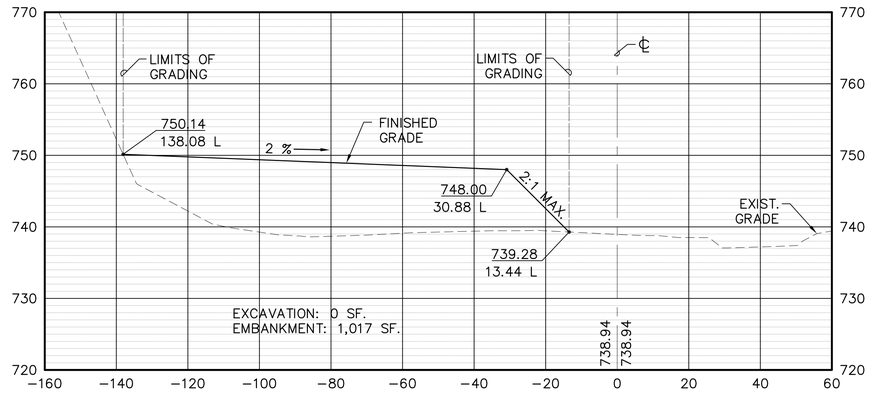
STA. 3+00



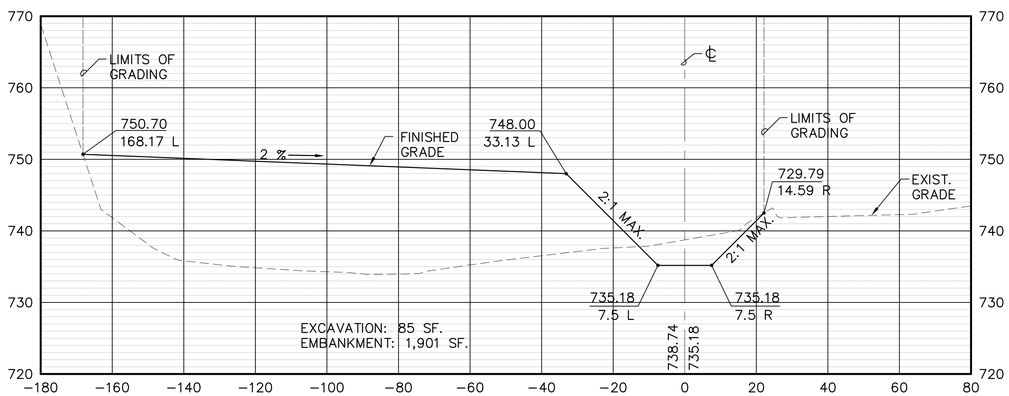
STA. 2+25



STA. 2+75



STA. 2+00



BREACH CHANNEL CROSS SECTIONS

SCALE: HOR.: 1" = 20'-0"
VER.: 1" = 10'-0"

IF THIS SHEET IS LESS THAN 36"X24", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

GRAPHIC SCALE:

20' 10' 0 20' 40'
SCALE: 1" = 20'

10' 5' 0 10' 20'
SCALE: 1" = 10'

LEGEND:

- EXISTING GRADE
- FINISHED GRADE
- ELEVATION / ℄ OFFSET
- SPOT ELEVATION CALLOUT

REVISION NO.	SYM.	DESCRIPTION	SHT.___ OF___	DATE	APPROVED: STATE PUBLIC WORKS ADMINISTRATOR

DERRICK C. ELFALAN
LICENSED PROFESSIONAL ENGINEER
No. 5448-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. "OBSERVATION OF CONSTRUCTION" AS DEFINED IN CHAPTER 16-115 SUBCHAPTER 1, DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES " PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS

Signature 04/30/12 Expiration date of the license

DEPT. OF ACCOUNTING & GENERAL SERVICES
DIVISION OF PUBLIC WORKS
STATE OF HAWAII

DLNR DAMS AND RESERVOIRS ON MAUI
KOLEA DAM (HI00097)
MAINTENANCE AND REMEDIATION IMPROVEMENTS
T.M.K.: 1-1-01:50
HAIKU, MAUI, HAWAII

BREACH CHANNEL – CROSS SECTIONS
STA. 2+00 TO 3+00

oceanit

DESIGNED BY: AK	CHECKED BY: DE	DAGS JOB NO. 15-23-7409	DRAWING NO. C-5
DRAWN BY: AK	APPROVED BY:	DATE MAY 2010	SHEET 11 OF 11 SHTS
SCALE: AS NOTED			

DRAWING NAME: I:\200939-DLNR_DAMS_AND_RESERVOIR_ON_MAUI\D GRAPHICS\DRAWINGS\CONTRACT DOCUMENTS\KOLEA RESERVOIR\FINAL\09_SECTIONS.DWG EDIT TIME: 05-10-10, 9:48 AM EDITED BY: AKEANE

FILE..... DRAWER..... FOLDER.....

APPENDIX G

Comments Received during the pre-consultation period

DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT
FORT SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF:

June 8, 2010

Regulatory Branch

DA File No.: POH-2010-00112

Ms. Joanne Hiramatsu
Manager, Environmental Engineering & Planning
Oceanit
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

Dear Ms. Hiramatsu:

This letter is in response to your request, dated May 3, 2010, for consultation comments for preparation of an Environmental Assessment (EA) for the proposed decommissioning and removal of the Kolea Dam and restoration of the stream to its natural state. You also requested a determination of any required Department of the Army (DA) permits. The project is located on the Kolea Stream near Keanae, Island of Maui, Hawaii (TMK: (2) 1-1-001:050). We have determined the potential project site contains waters under the regulatory jurisdiction of the Corps of Engineers.

Your proposed project was reviewed pursuant to Section 10 of the Rivers and Harbors Act of 1899 (Section 10) and Section 404 of the Clean Water Act (Section 404). Section 10 requires that a DA permit be obtained for certain structures or work in or affecting navigable waters of the United States (U.S.), prior to conducting the work (33 U.S.C. 403). Section 404 requires that a DA permit be obtained for the placement or discharge of dredged and/or fill material into waters of the U.S., including wetlands, prior to conducting the work (33 U.S.C. 1344). For regulatory purposes, the U.S. Army Corps of Engineers (Corps) defines wetlands as those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Section 404 regulates discharges of dredged material incidental to certain activities such as grading, mechanized land clearing, ditching or other excavation activity, and the installation of certain pile-supported structures.

While we have determined that the Kolea Stream at this location is not considered a navigable water of the U.S., we have determined that the grading and placement of riprap as part of this project will require a permit under Section 404. Our assertion of jurisdiction is based on our documentation that the waterbody in question is a water of the U.S. and recognition that the use, degradation, or destruction of this waterbody could affect interstate commerce.

We recommend your EA provide a detailed description of all ground-disturbing activities associated with the project construction occurring on and in the immediate vicinity of the project site; identify all streams (perennial, intermittent, or ephemeral) and wetlands on and in the immediate vicinity of the proposed project site; characterize the hydrology and ecology of those features; and provide a cross-section of the proposed work and the existing conditions at the

proposed project location. Your EA should include Best Management Practices proposed to mitigate the negative impacts to any aquatic environment and a thorough discussion of project alternatives that were considered, including those that may avoid any discharges into any water of the U.S.

This letter contains an approved JD for the property in question and is valid for a period of five (5) years unless new information warrants revision of the determination before the expiration date. If you object to this determination, you may request an Administrative Appeal under Corps regulations at 33 Code of Federal Regulations (CFR) Part 331. We have enclosed a Notification of Appeal Process and Request For Appeal (NAP/RFA) form. If you request to appeal this determination you must submit a completed RFA form, according to instructions in the RFA, to the Corps' Pacific Ocean Division office at the following address:

Thom Lichte, Appeals Review Officer
U.S. Army Corps of Engineers
Pacific Ocean Division, ATTN: CEPOD-PDC
Building 525
Fort Shafter, HI 96858-5440

Thank you for giving us the opportunity to review this proposal and for your cooperation with our regulatory program. Please be advised you can provide comments on your experience with the Honolulu District Regulatory Branch by accessing our web-based customer survey form at http://per2.nwp.usace.army.mil/survey.html.

Should you have any questions, please contact Mr. Robert Deroche of this office at the above address or telephone 808-438-2039 or by E-Mail at robert.d.deroche2@usace.army.mil. Please refer to File Number POH-2010-00112 in all future communications with this office regarding this or other projects at this location.

Sincerely,

George P. Young, P.E.
Chief, Regulatory Branch

Enclosures

APPROVED JURISDICTIONAL DETERMINATION FORM
U.S. Army Corps of Engineers

This form should be completed by following the instructions provided in Section IV of the JD Form Instructional Guidebook.

SECTION I: BACKGROUND INFORMATION

A. REPORT COMPLETION DATE FOR APPROVED JURISDICTIONAL DETERMINATION (JD): June 8, 2010

B. DISTRICT OFFICE, FILE NAME, AND NUMBER: CEPOH-EC-R Kolea Dam Decommissioning 2010-00112

C. PROJECT LOCATION AND BACKGROUND INFORMATION: Kolea Stream
State: Hawaii County/parish/borough: Maui City: Near Keanae
Center coordinates of site (lat/long in degree decimal format): Lat. 20.87261° N, Long. 156.18949° W.
Universal Transverse Mercator: 4
Name of nearest waterbody: Kolea Stream
Name of nearest Traditional Navigable Water (TNW) into which the aquatic resource flows: Pacific Ocean
Name of watershed or Hydrologic Unit Code (HUC): 20020000
☒ Check if map/diagram of review area and/or potential jurisdictional areas is/are available upon request.
☐ Check if other sites (e.g., offsite mitigation sites, disposal sites, etc…) are associated with this action and are recorded on a different JD form.

D. REVIEW PERFORMED FOR SITE EVALUATION (CHECK ALL THAT APPLY):
☒ Office (Desk) Determination. Date: June 8, 2010
☐ Field Determination. Date(s):

SECTION II: SUMMARY OF FINDINGS

A. RHA SECTION 10 DETERMINATION OF JURISDICTION.

There **Are no** *"navigable waters of the U.S."* within Rivers and Harbors Act (RHA) jurisdiction (as defined by 33 CFR part 329) in the review area. [*Required*]
☐ Waters subject to the ebb and flow of the tide.
☐ Waters are presently used, or have been used in the past, or may be susceptible for use to transport interstate or foreign commerce.
Explain:

B. CWA SECTION 404 DETERMINATION OF JURISDICTION.

There **Are** *"waters of the U.S."* within Clean Water Act (CWA) jurisdiction (as defined by 33 CFR part 328) in the review area. [*Required*]

1. **Waters of the U.S.**
   a. **Indicate presence of waters of U.S. in review area (check all that apply):** [1]
      ☐ TNWs, including territorial seas
      ☐ Wetlands adjacent to TNWs
      ☒ Relatively permanent waters[2] (RPWs) that flow directly or indirectly into TNWs
      ☐ Non-RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to but not directly abutting RPWs that flow directly or indirectly into TNWs
      ☐ Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs
      ☐ Impoundments of jurisdictional waters
      ☐ Isolated (interstate or intrastate) waters, including isolated wetlands

   b. **Identify (estimate) size of waters of the U.S. in the review area:**
      Non-wetland waters: linear feet: width (ft) and/or 1.2 acres.
      Wetlands: acres.

   c. **Limits (boundaries) of jurisdiction** based on: **Not established at this time.**
      Elevation of established OHWM (if known):

2. **Non-regulated waters/wetlands (check if applicable):**[3]
   ☐ Potentially jurisdictional waters and/or wetlands were assessed within the review area and determined to be not jurisdictional.
   Explain:

---

[1] Boxes checked below shall be supported by completing the appropriate sections in Section III below.
[2] For purposes of this form, an RPW is defined as a tributary that is not a TNW and that typically flows year-round or has continuous flow at least "seasonally" (e.g., typically 3 months).
[3] Supporting documentation is presented in Section III.F.

SECTION III: CWA ANALYSIS

A. TNWs AND WETLANDS ADJACENT TO TNWs

The agencies will assert jurisdiction over TNWs and wetlands adjacent to TNWs. If the aquatic resource is a TNW, complete Section III.A.1 and Section III.D.1. only; if the aquatic resource is a wetland adjacent to a TNW, complete Sections III.A.1 and 2 and Section III.D.1.; otherwise, see Section III.B below.

1. **TNW**
   Identify TNW:

   Summarize rationale supporting determination:

2. **Wetland adjacent to TNW**
   Summarize rationale supporting conclusion that wetland is "adjacent":

B. CHARACTERISTICS OF TRIBUTARY (THAT IS NOT A TNW) AND ITS ADJACENT WETLANDS (IF ANY):

This section summarizes information regarding characteristics of the tributary and its adjacent wetlands, if any, and it helps determine whether or not the standards for jurisdiction established under *Rapanos* have been met.

The agencies will assert jurisdiction over non-navigable tributaries of TNWs where the tributaries are "relatively permanent waters" (RPWs), i.e. tributaries that typically flow year-round or have continuous flow at least seasonally (e.g., typically 3 months). A wetland that directly abuts an RPW is also jurisdictional. If the aquatic resource is not a TNW, but has year-round (perennial) flow, skip to Section III.D.2. If the aquatic resource is a wetland directly abutting a tributary with perennial flow, skip to Section III.D.4.

A wetland that is adjacent to but that does not directly abut an RPW requires a significant nexus evaluation. Corps districts and EPA regions will include in the record any available information that documents the existence of a significant nexus between a relatively permanent tributary that is not perennial (and its adjacent wetlands if any) and a traditional navigable water, even though a significant nexus finding is not required as a matter of law.

If the waterbody[4] is not an RPW, or a wetland directly abutting an RPW, a JD will require additional data to determine if the waterbody has a significant nexus with a TNW. If the tributary has adjacent wetlands, the significant nexus evaluation must consider the tributary in combination with all of its adjacent wetlands. This significant nexus evaluation that combines, for analytical purposes, the tributary and all of its adjacent wetlands is used whether the review area identified in the JD request is the tributary, or its adjacent wetlands, or both. If the JD covers a tributary with adjacent wetlands, complete Section III.B.1 for the tributary, Section III.B.2 for any onsite wetlands, and Section III.B.3 for all wetlands adjacent to that tributary, both onsite and offsite. The determination whether a significant nexus exists is determined in Section III.C below.

1. **Characteristics of non-TNWs that flow directly or indirectly into TNW**

   (i) General Area Conditions:
   Watershed size: 0.6**square miles**
   Drainage area: 0.6 **square miles**
   Average annual rainfall: 150 inches
   Average annual snowfall: 0.0 inches

   (ii) Physical Characteristics:
   (a) Relationship with TNW:
   ☒ Tributary flows directly into TNW.
   ☐ Tributary flows through **Pick List** tributaries before entering TNW.

   Project waters are **1 (or less)** river miles from TNW.
   Project waters are **1-2** river miles from RPW.
   Project waters are **1 (or less)** aerial (straight) miles from TNW.
   Project waters are **1 (or less)** aerial (straight) miles from RPW.
   Project waters cross or serve as state boundaries. Explain:

   Identify flow route to TNW[5]: Kolea Stream flows directly into the Pacific Ocean.
   Tributary stream order, if known:

[4] Note that the Instructional Guidebook contains additional information regarding swales, ditches, washes, and erosional features generally and in the arid West.
[5] Flow route can be described by identifying, e.g., tributary a, which flows through the review area, to flow into tributary b, which then flows into TNW.

(b) General Tributary Characteristics (check all that apply):

Tributary is: ☒ Natural
☐ Artificial (man-made). Explain: .
☐ Manipulated (man-altered). Explain: Omao Reservoir was built on Omao Stream. There is an aquaduct that maintains flow to downstream .

Tributary properties with respect to top of bank (estimate):
Average width: 30 feet
Average depth: 10 feet
Average side slopes: **2:1.**

Primary tributary substrate composition (check all that apply):

☐ Silts	☐ Sands	☐ Concrete
☐ Cobbles	☐ Gravel	☐ Muck
☒ Bedrock	☐ Vegetation. Type/% cover: 75 grasses and shrubs	
☐ Other. Explain: .		

Tributary condition/stability [e.g., highly eroding, sloughing banks]. Explain: From applicant pictures, it appears stable.
Presence of run/riffle/pool complexes. Explain: Many. Stream is very dynamic at this location.
Tributary geometry: **Meandering**
Tributary gradient (approximate average slope): 1.5 %

(c) Flow:

Tributary provides for: **Pick List**
Estimate average number of flow events in review area/year: **Pick List**
Describe flow regime: .
Other information on duration and volume: .

Surface flow is: **Pick List.** Characteristics: .

Subsurface flow: **Pick List**. Explain findings: .
☐ Dye (or other) test performed: .

Tributary has (check all that apply):
☐ Bed and banks
☐ OHWM[6] (check all indicators that apply):

☐ clear, natural line impressed on the bank	☐ the presence of litter and debris
☐ changes in the character of soil	☐ destruction of terrestrial vegetation
☐ shelving	☐ the presence of wrack line
☐ vegetation matted down, bent, or absent	☐ sediment sorting
☐ leaf litter disturbed or washed away	☐ scour
☐ sediment deposition	☐ multiple observed or predicted flow events
☐ water staining	☐ abrupt change in plant community
☐ other (list):	

☐ Discontinuous OHWM.[7] Explain: .

If factors other than the OHWM were used to determine lateral extent of CWA jurisdiction (check all that apply):

☒ High Tide Line indicated by:	☒ Mean High Water Mark indicated by:
☐ oil or scum line along shore objects	☐ survey to available datum;
☐ fine shell or debris deposits (foreshore)	☐ physical markings;
☐ physical markings/characteristics	☐ vegetation lines/changes in vegetation types.
☐ tidal gauges	
☐ other (list):	

(iii) Chemical Characteristics:

Characterize tributary (e.g., water color is clear, discolored, oily film; water quality; general watershed characteristics, etc.).
Explain: .
Identify specific pollutants, if known: .

---

[6]A natural or man-made discontinuity in the OHWM does not necessarily sever jurisdiction (e.g., where the stream temporarily flows underground, or where the OHWM has been removed by development or agricultural practices). Where there is a break in the OHWM that is unrelated to the waterbody's flow regime (e.g., flow over a rock outcrop or through a culvert), the agencies will look for indicators of flow above and below the break.
[7]Ibid.

(iv) Biological Characteristics. Channel supports (check all that apply):

- ☐ Riparian corridor. Characteristics (type, average width): .
- ☐ Wetland fringe. Characteristics: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

2. Characteristics of wetlands adjacent to non-TNW that flow directly or indirectly into TNW

(i) Physical Characteristics:

(a) General Wetland Characteristics:

Properties:

Wetland size: acres

Wetland type. Explain: .

Wetland quality. Explain: .

Project wetlands cross or serve as state boundaries. Explain: .

(b) General Flow Relationship with Non-TNW:

Flow is: Pick List. Explain: .

Surface flow is: Pick List

Characteristics: .

Subsurface flow: Pick List. Explain findings: .

- ☐ Dye (or other) test performed: .

(c) Wetland Adjacency Determination with Non-TNW:

- ☐ Directly abutting
- ☐ Not directly abutting
  - ☐ Discrete wetland hydrologic connection. Explain: .
  - ☐ Ecological connection. Explain: .
  - ☐ Separated by berm/barrier. Explain: .

(d) Proximity (Relationship) to TNW

Project wetlands are Pick List river miles from TNW.

Project waters are Pick List aerial (straight) miles from TNW.

Flow is from: Pick List.

Estimate approximate location of wetland as within the Pick List floodplain.

(ii) Chemical Characteristics:

Characterize wetland system (e.g., water color is clear, brown, oil film on surface; water quality; general watershed characteristics; etc.). Explain: .

Identify specific pollutants, if known: .

(iii) Biological Characteristics. Wetland supports (check all that apply):

- ☐ Riparian buffer. Characteristics (type, average width): .
- ☐ Vegetation type/percent cover. Explain: .
- ☐ Habitat for:
  - ☐ Federally Listed species. Explain findings: .
  - ☐ Fish/spawn areas. Explain findings: .
  - ☐ Other environmentally-sensitive species. Explain findings: .
  - ☐ Aquatic/wildlife diversity. Explain findings: .

3. Characteristics of all wetlands adjacent to the tributary (if any)

All wetland(s) being considered in the cumulative analysis: Pick List

Approximately ( ) acres in total are being considered in the cumulative analysis.

For each wetland, specify the following:

Directly abuts? (Y/N)	Size (in acres)	Directly abuts? (Y/N)	Size (in acres)

Summarize overall biological, chemical and physical functions being performed:

C. SIGNIFICANT NEXUS DETERMINATION

A significant nexus analysis will assess the flow characteristics and functions of the tributary itself and the functions performed by any wetlands adjacent to the tributary to determine if they significantly affect the chemical, physical, and biological integrity of a TNW. For each of the following situations, a significant nexus exists if the tributary, in combination with all of its adjacent wetlands, has more than a speculative or insubstantial effect on the chemical, physical and/or biological integrity of a TNW. Considerations when evaluating significant nexus include, but are not limited to the volume, duration, and frequency of the flow of water in the tributary and its proximity to a TNW, and the functions performed by the tributary and all its adjacent wetlands. It is not appropriate to determine significant nexus based solely on any specific threshold of distance (e.g. between a tributary and its adjacent wetland or between a tributary and the TNW). Similarly, the fact an adjacent wetland lies within or outside of a floodplain is not solely determinative of significant nexus.

Draw connections between the features documented and the effects on the TNW, as identified in the *Rapanos* Guidance and discussed in the Instructional Guidebook. Factors to consider include, for example:

- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to carry pollutants or flood waters to TNWs, or to reduce the amount of pollutants or flood waters reaching a TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), provide habitat and lifecycle support functions for fish and other species, such as feeding, nesting, spawning, or rearing young for species that are present in the TNW?
- Does the tributary, in combination with its adjacent wetlands (if any), have the capacity to transfer nutrients and organic carbon that support downstream foodwebs?
- Does the tributary, in combination with its adjacent wetlands (if any), have other relationships to the physical, chemical, or biological integrity of the TNW?

Note: the above list of considerations is not inclusive and other functions observed or known to occur should be documented below:

1. **Significant nexus findings for non-RPW that has no adjacent wetlands and flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary itself, then go to Section III.D:

2. **Significant nexus findings for non-RPW and its adjacent wetlands, where the non-RPW flows directly or indirectly into TNWs.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

3. **Significant nexus findings for wetlands adjacent to an RPW but that do not directly abut the RPW.** Explain findings of presence or absence of significant nexus below, based on the tributary in combination with all of its adjacent wetlands, then go to Section III.D:

D. DETERMINATIONS OF JURISDICTIONAL FINDINGS. THE SUBJECT WATERS/WETLANDS ARE (CHECK ALL THAT APPLY):

1. **TNWs and Adjacent Wetlands.** Check all that apply and provide size estimates in review area:
   - ☐ TNWs: linear feet width (ft), Or, acres.
   - ☐ Wetlands adjacent to TNWs: acres.

2. **RPWs that flow directly or indirectly into TNWs.**
   - ☒ Tributaries of TNWs where tributaries typically flow year-round are jurisdictional. Provide data and rationale indicating that tributary is perennial: Atlas of Hawaiian Watersheds & Their Aquatic Resources lists stream as perrenial.
   - ☐ Tributaries of TNW where tributaries have continuous flow "seasonally" (e.g., typically three months each year) are jurisdictional. Data supporting this conclusion is provided at Section III.B. Provide rationale indicating that tributary flows seasonally:

Provide estimates for jurisdictional waters in the review area (check all that apply):
- ☐ Tributary waters: linear feet width (ft).
- ☐ Other non-wetland waters: acres.
  Identify type(s) of waters: .

3. **Non-RPWs[8] that flow directly or indirectly into TNWs.**
   ☐ Waterbody that is not a TNW or an RPW, but flows directly or indirectly into a TNW, and it has a significant nexus with a TNW is jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional waters within the review area (check all that apply):
   - ☐ Tributary waters: linear feet width (ft).
   - ☐ Other non-wetland waters: acres.
     Identify type(s) of waters: .

4. **Wetlands directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands directly abut RPW and thus are jurisdictional as adjacent wetlands.
   ☐ Wetlands directly abutting an RPW where tributaries typically flow year-round. Provide data and rationale indicating that tributary is perennial in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   ☐ Wetlands directly abutting an RPW where tributaries typically flow "seasonally." Provide data indicating that tributary is seasonal in Section III.B and rationale in Section III.D.2, above. Provide rationale indicating that wetland is directly abutting an RPW: .

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

5. **Wetlands adjacent to but not directly abutting an RPW that flow directly or indirectly into TNWs.**
   ☐ Wetlands that do not directly abut an RPW, but when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisidictional. Data supporting this conclusion is provided at Section III.C.

   Provide acreage estimates for jurisdictional wetlands in the review area: acres.

6. **Wetlands adjacent to non-RPWs that flow directly or indirectly into TNWs.**
   ☐ Wetlands adjacent to such waters, and have when considered in combination with the tributary to which they are adjacent and with similarly situated adjacent wetlands, have a significant nexus with a TNW are jurisdictional. Data supporting this conclusion is provided at Section III.C.

   Provide estimates for jurisdictional wetlands in the review area: acres.

7. **Impoundments of jurisdictional waters.[9]**
   As a general rule, the impoundment of a jurisdictional tributary remains jurisdictional.
   - ☐ Demonstrate that impoundment was created from "waters of the U.S.," or
   - ☐ Demonstrate that water meets the criteria for one of the categories presented above (1-6), or
   - ☐ Demonstrate that water is isolated with a nexus to commerce (see E below).

E. ISOLATED [INTERSTATE OR INTRA-STATE] WATERS, INCLUDING ISOLATED WETLANDS, THE USE, DEGRADATION OR DESTRUCTION OF WHICH COULD AFFECT INTERSTATE COMMERCE, INCLUDING ANY SUCH WATERS (CHECK ALL THAT APPLY):[10]
- ☐ which are or could be used by interstate or foreign travelers for recreational or other purposes.
- ☐ from which fish or shellfish are or could be taken and sold in interstate or foreign commerce.
- ☐ which are or could be used for industrial purposes by industries in interstate commerce.
- ☐ Interstate isolated waters. Explain: .
- ☐ Other factors. Explain: .

Identify water body and summarize rationale supporting determination: .

---

[8] See Footnote # 3.
[9] To complete the analysis refer to the key in Section III.D.6 of the Instructional Guidebook.
[10] **Prior to asserting or declining CWA jurisdiction based solely on this category, Corps Districts will elevate the action to Corps and EPA HQ for review consistent with the process described in the Corps/EPA *Memorandum Regarding CWA Act Jurisdiction Following Rapanos.***

Provide estimates for jurisdictional waters in the review area (check all that apply):
☐ Tributary waters: linear feet width (ft).
☐ Other non-wetland waters: acres.
Identify type(s) of waters: .
☐ Wetlands: acres.

F. NON-JURISDICTIONAL WATERS, INCLUDING WETLANDS (CHECK ALL THAT APPLY):
☐ If potential wetlands were assessed within the review area, these areas did not meet the criteria in the 1987 Corps of Engineers Wetland Delineation Manual and/or appropriate Regional Supplements.
☐ Review area included isolated waters with no substantial nexus to interstate (or foreign) commerce.
☐ Prior to the Jan 2001 Supreme Court decision in "*SWANCC*," the review area would have been regulated based solely on the "Migratory Bird Rule" (MBR).
☐ Waters do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction. Explain: .
☐ Other: (explain, if not covered above): .

Provide acreage estimates for non-jurisdictional waters in the review area, where the sole potential basis of jurisdiction is the MBR factors (i.e., presence of migratory birds, presence of endangered species, use of water for irrigated agriculture), using best professional judgment (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

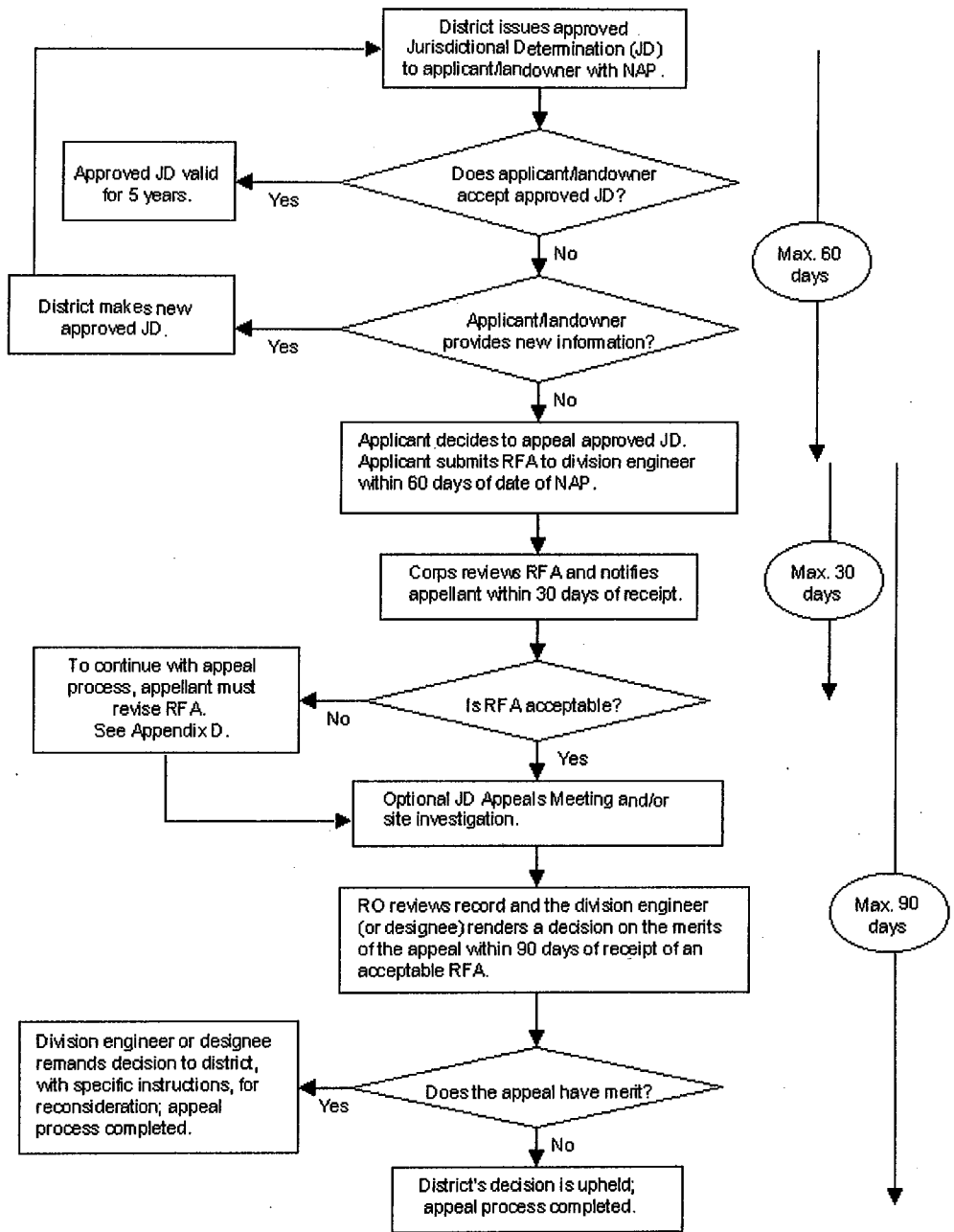
Provide acreage estimates for non-jurisdictional waters in the review area that do not meet the "Significant Nexus" standard, where such a finding is required for jurisdiction (check all that apply):
☐ Non-wetland waters (i.e., rivers, streams): linear feet, width (ft).
☐ Lakes/ponds: acres.
☐ Other non-wetland waters: acres. List type of aquatic resource: .
☐ Wetlands: acres.

SECTION IV: DATA SOURCES.

A. SUPPORTING DATA. Data reviewed for JD (check all that apply - checked items shall be included in case file and, where checked and requested, appropriately reference sources below):
☒ Maps, plans, plots or plat submitted by or on behalf of the applicant/consultant: .
☐ Data sheets prepared/submitted by or on behalf of the applicant/consultant.
☐ Office concurs with data sheets/delineation report.
☐ Office does not concur with data sheets/delineation report.
☐ Data sheets prepared by the Corps: .
☐ Corps navigable waters' study: .
☒ U.S. Geological Survey Hydrologic Atlas: .
☐ USGS NHD data.
☒ USGS 8 and 12 digit HUC maps.
☒ U.S. Geological Survey map(s). Cite scale & quad name:1:24K CA-SAUNDERS REEF.
☐ USDA Natural Resources Conservation Service Soil Survey. Citation: .
☐ National wetlands inventory map(s). Cite name: .
☐ State/Local wetland inventory map(s): .
☐ FEMA/FIRM maps: .
☐ 100-year Floodplain Elevation is: (National Geodectic Vertical Datum of 1929)
☒ Photographs: ☒ Aerial (Name & Date): Google 2009 Digital Globe.
or ☒ Other (Name & Date): applicant provided ground photographs under cover letter dated May 3, 2010.
☐ Previous determination(s). File no. and date of response letter: .
☐ Applicable/supporting case law: .
☐ Applicable/supporting scientific literature: .
☐ Other information (please specify): .

B. ADDITIONAL COMMENTS TO SUPPORT JD: .

Administrative Appeal Process for Approved Jurisdictional Determinations



Appendix C

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL		
Applicant: State Department of Accounting and General Services - Hawaii	File Number: POH-2010-00112	Date: June 8, 2010
Attached is:		See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)	A
	PROFFERED PERMIT (Standard Permit or Letter of permission)	B
	PERMIT DENIAL	C
XX	APPROVED JURISDICTIONAL DETERMINATION	D
	PRELIMINARY JURISDICTIONAL DETERMINATION	E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://www.usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

B: PROFFERED PERMIT: You may accept or appeal the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

SECTION II - REQUEST FOR APPEAL or OBJECTIONS TO AN INITIAL PROFFERED PERMIT

REASONS FOR APPEAL OR OBJECTIONS: (Describe your reasons for appealing the decision or your objections to an initial proffered permit in clear concise statements. You may attach additional information to this form to clarify where your reasons or objections are addressed in the administrative record.)

ADDITIONAL INFORMATION: The appeal is limited to a review of the administrative record, the Corps memorandum for the record of the appeal conference or meeting, and any supplemental information that the review officer has determined is needed to clarify the administrative record. Neither the appellant nor the Corps may add new information or analyses to the record. However, you may provide additional information to clarify the location of information that is already in the administrative record.

POINT OF CONTACT FOR QUESTIONS OR INFORMATION:

If you have questions regarding this decision and/or the appeal process you may contact:	If you only have questions regarding the appeal process you may also contact:
Robert D. Deroche U.S. Army Corps of Engineers Honolulu District, ATTN: CEPOH-EC-R Building 230 Fort Shafter, HI 96858-5440 Tel. (808) 438-2039	Thom Lichte, Appeal Review Officer Pacific Ocean Division ATTN: CEPOD-PDC Building 525 Fort Shafter, HI 96858-5440 Tel. (808) 438-0397

RIGHT OF ENTRY: Your signature below grants the right of entry to Corps of Engineers personnel, and any government consultants, to conduct investigations of the project site during the course of the appeal process. You will be provided a 15 day notice of any site investigation, and will have the opportunity to participate in all site investigations.

	Date:	Telephone number:
_____ Signature of appellant or agent.		

CHARMAINE TAVARES
Mayor

MILTON M. ARAKAWA, A.I.C.P.
Director

MICHAEL M. MIYAMOTO
Deputy Director

RALPH M. NAGAMINE, L.S., P.E.
Development Services Administration

CARY YAMASHITA, P.E.
Engineering Division

BRIAN HASHIRO, P.E.
Highways Division

COUNTY OF MAUI
DEPARTMENT OF PUBLIC WORKS
DEVELOPMENT SERVICES ADMINISTRATION
250 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793

May 20, 2010

Joanne Hiramatsu, Manager
Environmental Engineering & Planning
OCEANIT
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

Subject: CONSULT FOR ENVIRONMENTAL ASSESSMENT FOR REMOVAL OF KOLEA RESERVOIR
TMK (2) 1-1-001:050

Dear Ms. Hiramatsu:

We reviewed the subject application and have no comments at this time.

Please call Michael Miyamoto at 270-7845 if you have any questions regarding this letter.

Sincerely,

Milton M. Arakawa, A.I.C.P.
Director of Public Works

ls S:\LUCA\CZM\kolea_dam_ea_11001050_ls.wpd
xc: Highways Division
Engineering Division

CHARMAINE TAVARES
Mayor
KATHLEEN ROSS AOKI
Director
ANN T. CUA
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PLANNING

May 28, 2010

Joanne Hiramatsu
Oceanit Center
828 Fort Street Mall, Suite 600
Honolulu, HI 96813

Dear Ms. Hiramatsu:

SUBJECT: PRE-CONSULTATION FOR DAGS KOLEA RESRVOIR AND DAM REMOVAL PROJECT, LOCATED AT KOLEA, HANA, MAUI, TMK: (2) 1-1-001:050, (RFC 2010/0064)

The Department of Planning (Department) is in receipt of your May 19, 2010 request to comment on Kolea Dam (HI 0097) Reservoir removal. The project is subject to the Coastal Zone Management Act and HRS 205A must be observed. That said we are not aware of any additional permits applicable to this project as this TMK is not located with the Special Management Area (SMA). However, we would like the opportunity to comment on the Environmental Assessment Draft when available.

Thank you for your cooperation. If additional clarification is required, please contact Staff Planner Anna Benesovska by email at anna.benesovska@mauicounty.gov or by telephone at (808) 463-3867.

Sincerely,

CLAYTON I. YOSHIDA, AICP
Planning Program Administrator

For: KATHLEEN ROSS AOKI
Planning Director

xc: Anna Benesovska, Staff Planner
General File
Project File

KRA:CIY:ANB:xxxx
K:\WP_DOCS\PLANNING\RFC\2010\0064_Kolea_Dam_Reservoir_Removal\Kolea_Dam_Reservoir_Removal.doc

LINDA LINGLE
GOVERNOR
THEODORE E. LIU
DIRECTOR
PEARL IMADA IBOSHI
DEPUTY DIRECTOR
ABBEY SETH MAYER
DIRECTOR
OFFICE OF PLANNING

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

OFFICE OF PLANNING
235 South Beretania Street, 6th Floor, Honolulu, Hawaii 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

Telephone: (808) 587-2846
Fax: (808) 587-2824

Ref. No. P-13024

May 28, 2010

Ms. Joanne Hiramatsu, Manager
Environmental Engineering & Planning
Oceanit
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

Dear Ms. Hiramatsu:

Subject: Hawaii Coastal Zone Management (CZM) Program Federal Consistency Requirements for Removal of Kolea Dam (HI 00097) and Reservoir, Maui; TMK (2) 1-1-1: 50

The proposed removal of Kolea Dam and Reservoir may be subject to a CZM federal consistency review if a Department of the Army Permit is required from the U.S. Army Corps of Engineers. If the Corps permit is required, the CZM Program should be consulted prior to submitting the CZM federal consistency application to determine the applicable requirements.

Potential areas of CZM interest are: construction related impacts to the water quality of both the stream and the ocean receiving waters; impacts to aquatic resources; and effects of the proposed riprap on stream flow and stream biology. Additional areas of interest may become relevant during the CZM federal consistency review.

Information about the CZM federal consistency review, application instructions, application form, and assessment form are available at the Hawaii CZM Program web site: http://www.hawaii.gov/dbedt/czm/, in the "Federal Consistency" section. The CZM federal consistency review involves publishing a public notice in the State Office of Environmental Quality Control's bulletin, *The Environmental Notice*, and providing a public review and comment period. If you have any questions, please call John Nakagawa of our CZM Program at 587-2878.

Sincerely,

Mary Lou Kobayashi for

Abbey Seth Mayer
Director

c: U.S. Army Corps of Engineers, Regulatory Branch
Department of Planning, County of Maui

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P.O. BOX 621
HONOLULU, HAWAII 96809

June 7, 2010

Ref.: RFD.2663.6

Ms. Joanne Hiramatsu
Oceanit
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

Dear Ms. Hiramatsu:

Pre-Consultation for DAGS Kolea Reservoir and Dam Removal Project
Kolea Stream, Island of Maui
TMK: (2) 1-1-001:050

Reference is made to a response letter to you from the Department of Land and Natural Resources' Office of Conservation and Coastal Lands, dated May 18, 2010, requesting pre-consultation comments concerning the DAGS Kolea Reservoir and Dam Removal Project.

The Commission on Water Resource Management (Commission), Stream Protection and Management Branch, has the responsibility to protect stream channels from alteration whenever practicable to provide for fishery, wildlife, recreational, aesthetic, scenic, and other beneficial instream uses in the State of Hawaii under the authorization of the State Water Code (Code), Chapter 174C, Hawaii Revised Statutes, and Chapter 13-169, Hawaii Administrative Rules (Protection of Instream Uses of Water).

Pursuant to the Code, §174C-93, "No person shall construct or alter a stream diversion works, other than in the course of normal maintenance, without first obtaining a permit from the commission." The term "stream diversion works" is defined in the Code, "means any artificial or natural structure emplaced within the stream for the purpose of diverting stream water." Furthermore, the Code defines "stream" as any "natural watercourse in which water usually flows in a defined bed or channel."

Based on the information contained therein and because Kolea Reservoir was registered as a stream diversion work (*REG.231.6*) by East Maui Irrigation Company, the Commission shall require a Stream Diversion Works Abandonment Permit for the proposed project. Work performed without appropriate permits or authorizations may be subject to fines and/or remedial actions.

Please be advised that the project may require other agency approvals regarding wetlands, water quality, grading, stockpiling, and floodways. This letter should not be used for other regulatory jurisdictions or used to imply compliance with other federal, state, or county rules.

Enclosed is a Stream Channel Alteration Permit Application Form. Additional forms may be picked up at our office or downloaded from our website at: http://www.hawaii.gov/dlnr/cwrm/forms.htm

Should you have any questions, please contact Robert Chong of the Stream Protection and Management Branch at (808) 587-0266, or toll free from the Big Island at 974-4000, extension 70266, or robert.k.chong@ hawaii.gov.

Sincerely,

for KEN C. KAWAHARA, P.E.
Deputy Director

c: Office of Conservation and Coastal Lands
Engineering Division

LINDA LINGLE
GOVERNOR OF HAWAII

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

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

In reply, please refer to:
DOH/CWB

05080CEC.10

May 28, 2010

Ms. Joanne Hiramatsu
Manager
Environmental Engineering & Planning
Oceanit
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

Dear Ms. Hiramatsu:

SUBJECT: DLNR Dams and Reservoirs on Maui
Kolea Dam (HI 00097) Reservoir
TMK: [2] 1-1-001:050
Consultation for Environmental Assessment (EA)

The Department of Health (DOH), Clean Water Branch (CWB), acknowledges receipt of your letter, dated May 10, 2010, requesting early consultation comments for the subject project. The CWB has reviewed the subject document and offers these comments on your project. Please note that our review is based solely on the information provided in the subject document and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at http://www.hawaii.gov/health/environmental/env-planning/landuse/CWB-standardcomment.pdf.

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

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

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

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

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

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

b. Discharges of construction dewatering effluent.

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

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

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

Sincerely,

ALEC WONG, P.E., CHIEF
Clean Water Branch

EC:ml

c: DOH-EPO #I-3180 [via email only]

LINDA LINGLE
GOVERNOR OF HAWAII

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

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY DIRECTOR - WATER

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

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

REF:OCCL:AB

Correspondence MA-10-229

MAY 18 2010

Joanne Hiramatsu
Oceanit
828 Fort Street Mall, Suite 600
Honolulu, Hawai'i 96813

SUBJECT: Pre-Consultation for DAGS Kolea Reservoir and Dam Removal Project, Located at Kolea, Hāna, Maui, TMK: (2) 1-1-001:050

Dear Ms. Hiramatsu:

The Department of Land and Natural Resources (DLNR) Office of Conservation and Coastal Lands (OCCL) is in receipt of your letter requesting pre-consultation comments on the State Department of Accounting and General Services (DAGS) Kolea Reservoir and Dam removal project, located at Kolea, Hāna, Maui, TMK: (2) 1-1-001:050.

According to the information you provided, the dam was constructed in 1901 in the path of the existing stream. The project entails breaching the dam and restoring the stream to a more natural condition. During construction, the existing spillway will be used to divert flows away from the construction site. Water from the project will enter the existing stream at the same location of the existing spillway via a riprap.

According to our records, there has been no previous Conservation District Use Application (CDUA) filed for the subject parcel. The subject parcel is located within the State Land Use Conservation District, Protective and Resource Subzones. The removal of the reservoir and dam is identified land use in the Conservation District pursuant to Hawai'i Administrative Rules (HAR) §13-5-22 *Identified Land Uses in the Protective Subzone*, P-9 STRUCTURES, EXISTING, (C-1) *Demolition, removal, or alteration of existing structures, facilities, and equipment. Any historic property shall be evaluated by the department for historical significance.*

The project would require filing a CDUA for a Departmental permit. If the project site is not considered a historic property, the project may be exempt from an Environmental Assessment (EA) pursuant to HAR §11-200-8(a)(8).

Should you have any questions regarding this correspondence, please contact Audrey Barker of our office at (808) 587-0316 or audrey.t.barker@hawaii.gov.

Sincerely,

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

C: Chairperson
MDLO/DOFAW/SHPD/DAR/CWRM
Maui Planning Department

PHONE (808) 594-1888

FAX (808) 594-1865

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

HRD10/4993

May 25, 2010

Oceanit
Attention: Joanne Hiramatsu, Manager
828 Fort Street Mall, Suite 600
Honolulu, Hawai'i 96813

Re: Consultation for Environmental Assessment for Removal of the Kolea Dam (HI 00097) Reservoir, Makuīwa Ahupua'a, Maui, TMK No. (2) 1-1-001:050

Aloha e Joanne Hiramatsu:

The Office of Hawaiian Affairs (OHA) is in receipt of your May 3, 2010 request for consultation and comments ahead of the draft environmental assessment (EA) on the above-referenced project. We thank you for the opportunity to provide input.

OHA understands that the State of Hawai'i Department of Accounting and General Services (DAGS) plans to remove the Kolea Dam and Reservoir in the ahupua'a of Makuīwa on the island of Maui. The dam, originally constructed in 1901, will be breached in order to restore stream flow to a more natural condition. The project site is located within the State Conservation district and is designated as Conservation in the County of Maui Community Plan. In February 2010, Cultural Surveys Hawaii conducted an Archeological Inventory Survey of the project area.

In response to your inquiry, OHA does not require any permits for the project and does not have comments at this stage of the planning process. Nonetheless, we rely on the proposing agency to obtain all necessary permits from other State and Federal agencies. We also look forward to reviewing and providing comments on the draft EA for this project. OHA supports DAGS's effort to restore instream flow, which in turn, supports traditional and customary Native Hawaiian rights and practices.

Should you have any questions, please contact Everett Ohta at 594-0231 or by email at everetto@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Chief Executive Officer

From: Paula_Levin@fws.gov
Sent: Monday, May 24, 2010 1:07 PM
To: Joanne Hiramatsu
Cc: Gordon_Smith@fws.gov; Jennifer_Higashino@fws.gov; Craig_Rowland@fws.gov; Dan_Polhemus@fws.gov
Subject: Kolea Stream

Joanne Hiramatsu, Manager, Environmental Engineering and Planning Oceanit, Inc.

Dear Joanne:

This is in response to your May 6, 2010 correspondence regarding the restoration of Kolea Stream via removal of the Kolea Reservoir Dam on Maui. Your early inquiry requested us to provide review, comments and concerns regarding information to include in the Environmental Assessment (EA) for this project and identification of permit compliance needs.

I am providing comments below regarding information to include in your EA and other environmental compliance, and I recommend you contact two of our biologists regarding habitat restoration technical assistance and possible partnership on this proposal:

Gordon Smith, Fish Habitat Partnership Coordinator; 808-792-9400 (Fish and stream species, aquatic habitat) Jennifer Higashino, Maui Nui Conservation Partnerships Biologist, 371-3284.
(Birds, plants, riparian, wetland, other habitat)

Aquatic Environment concerns that should be addressed in EA:

We recommend for your environmental assessment that you address compliance with Section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531 et.seq .), as amended (ESA). We recommend that you request a list of threatened and endangered species in the area to ensure that impacts to species will be avoided. The project may be within proximity to important habitat for recovery of endangered Hawaiian waterbirds, damselflies, other invertebrates, and plants. It is important to evaluate potential impacts of the project on these species, whether beneficial or detrimental.

Native stream species: Please provide any available survey data regarding the historical or current presence of native stream species. If no data are available, we can assist you in identifying appropriate survey methods or data needs, and possibly assist you in the stream or riparian habitat surveys.

Native riparian and aquatic plant species: Will the stream be reconnected to its historic floodplain and will there be any potential effects on populations of native vegetation or endangered plants or habitat in the construction area, in the potentially restored stream, or in the lowered reservoir area?

If there are invasive aquatic/stream species limited to below the dam (which could be a barrier to the passage of native stream species),the project should be designed to not allow the access or spread of these species upstream after the removal of the barrier. It is also important to determine if a survey is needed for invasive species.

Additionally, consistent with NOAA's stated concerns, USFWS also would like to see additional information regarding evaluation of impacts to the marine environment:

1. Does this design involve minimal hard structures (channel bed and bank armoring) and does it retain to the greatest extent, the natural

characteristics of the stream bed and banks?

2. Please quantify potential impacts, i.e. if/how the preferred alternative (both during construction and after) would lead to increased sediment/pollution loading in the stream and thus discharge in to the nearshore marine environment.

3. Please describe what fish and marine benthic resources (coral, seagrass, soft sediment,algae,macro-invertebrates) are found at and adjacent to the mouth of the stream in the nearshore environment. These species could be impacted by sediment loading resulting from the project construction. If available, please provide any existing marine assessment or survey data on this area. If there are no data available, a survey may be needed to adequately evaluate impacts of the project.

4. describe the avoidance and minimization measures, or best management practices, that will be implemented to reduce and limit sediment/pollution input to the stream and nearshore environment.

We appreciate your interest in natural resource conservation and your providing us with the opportunity for early review and comment on your proposal. Please contact Gordon Smith and Jennifer Higashino regarding habitat restoration technical assistance, at the phone numbers provided above, or contact me regarding additional NEPA or ESA concerns if you have any questions.

Paula Levin
USFWS Pacific Islands
Coastal Conservation
(808)792-9417

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

DATE: June 7, 2010

LOG 2010.1944
DOC: 1006RS17

TO: Joanne Hiramatsu
Manager, Environmental Engineering and Planning
Oceanit
828 Fort Street Mall, Unit 600
Honolulu, HI 96813

SUBJECT: **Chapter 6E-8 Review / Consultation for Environmental Assessment (EA) DLNR Dams and Reservoirs on Maui**
Permit: (None)
Owner: State of Hawaii
Location: Kolea Dam (HI 00097) Reservoir
Tax Map Key: (2) 1-1-001:050

This letter is in response to your communication of May 3, 2010, received by our office on May 6, 2010, re the proposed demolition of the Kolea Dam and restoration of the natural stream bed on Maui. The area of potential effect would be the streambed in immediate vicinity of the dam.

The dam was constructed in 1901 for water storage necessary for agricultural operations. As such it is eligible for the Hawaii and National Registers of Historic Places under Criteria A (events) and C (design), exemplifying the rise of commercial agricultural production in Hawaii and its impact on landscape, economics, society, and politics.

We find that the project will have effect, with proposed mitigation. An archaeological Inventory Study conducted by Cultural Surveys Hawaii in February 2010 recommended that a Historic American Engineering (HAER) report be submitted for the site. We agree with this assessment and also feel that the project warrants an Architectural Inventory Survey Report.

Any questions should be addressed to Ross W. Stephenson, SHPD Historian, at 692-8028 or ross.w.stephenson@hawaii.gov.

Mahalo for the opportunity to comment.

Pua Aiu, Administrator, Hawaii Historic Preservation Division, DLNR

Date 6/10/10

In the event that historic resources, including human skeletal remains, lava tubes, and lava blisters/bubbles are identified during construction activities, all work should cease in the immediate vicinity of the find, the find should be protected from additional disturbance, and the State Historic Preservation Division should be contacted immediately at (808) 692-8015.

APPENDIX H:

Kolea Stream Assessment, Oceanit 2011

oceanit
innovation through engineering & scientific excellence

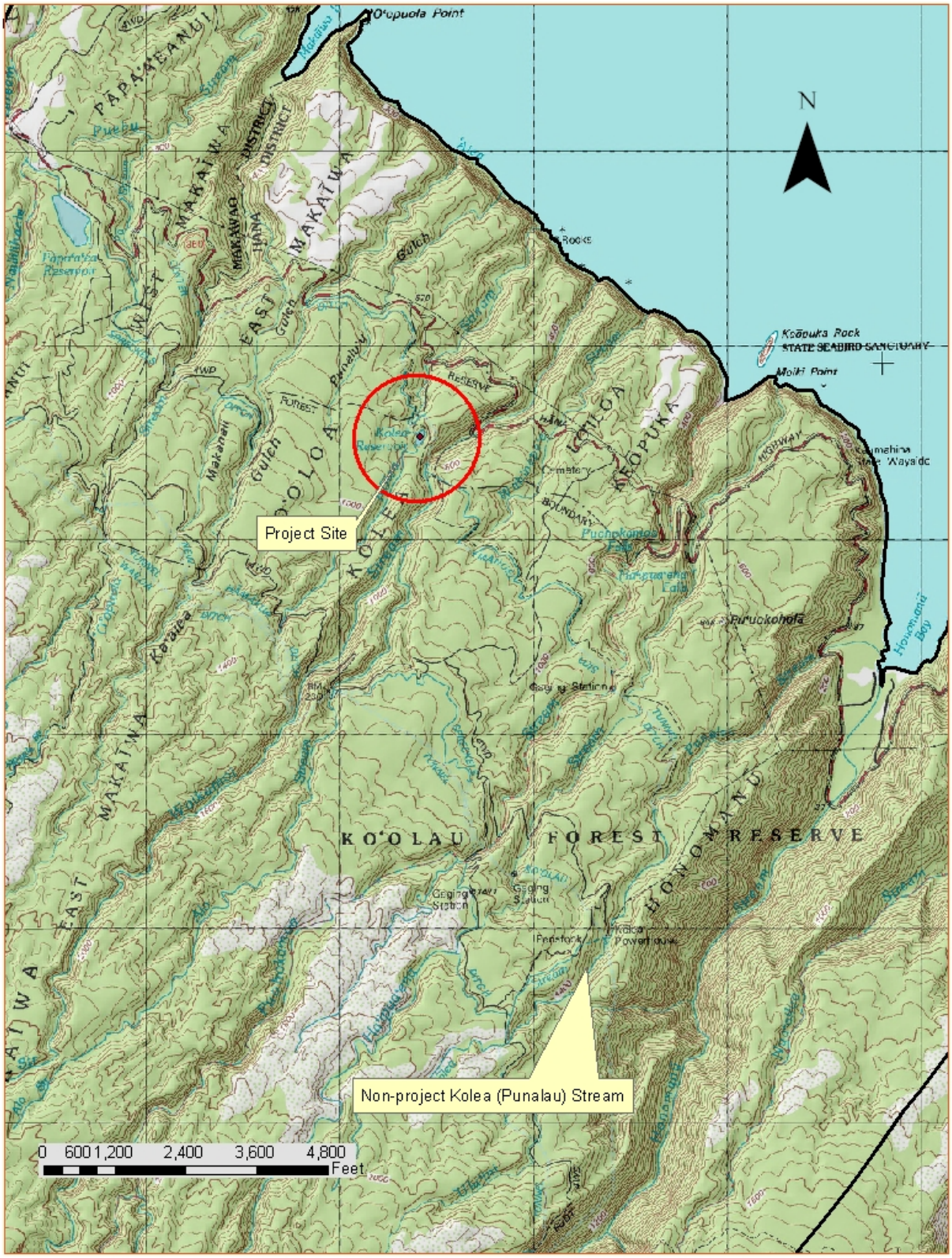
To: Derrick Elfalan, Chief, Engineering Department
From: Bob Bourke, Environmental Scientist
Date: January 5, 2011
Subject: Kolea Stream Assessment

On Thursday, December 30, 2010, John Pipan and I visited the Kolea Dam site on Maui limiting our observations below the highway to inspect the stream mouth and its ocean outfall. Pictures were taken from below Hana Highway to the mouth of Kolea Stream (see attached photos). We parked at the trail head and crossed the road to walk down the ranch road through the locked gate. The dirt road proceeds downward along the ridge top about ¼ mile past a ranch bunkhouse equipment structure. An overlook photo taken below the ranch building shows the general lush overgrown nature of the small stream valley. At about ¼ mile, before it reaches the coast, the jeep trail splits, with one branch going down either side of the ridge. We took the left fork down to the Kolea Stream. The stream bed is in a very deep (20-30 ft) gulch with almost vertical sides up to a grassy pasture area. Several photos were taken of the stream bed by leaning out and extending the camera over the chasm. Note that the extremely narrow cobble and rock stream bed with steep walls does not appear susceptible to the settlement of fine sediments.

The shoreline is an almost vertical cliff estimated to be 300 feet high (rock fall time to ocean was 4+ seconds) to the point where the stream falls over the cliff face. The cliff face is lined with Hala trees making it difficult to photograph the actual shoreline. We also accessed the trail on the other (east) side of the ridge down to a similar elevation, incised stream, and cliff face. The photos of the adjacent headland were taken from this point. Note the height of the horizon on the adjacent cliff and the character of the shoreline below. It is my opinion that accessing the stream mouth from the land side would not be practical.

The beach itself appears to consist of cliff face boulder rubble. The boulder rubble at the base of the cliff appears to be completely awash at high tide, but rapidly slopes to deep water. There is no offshore reef at this location with North Pacific swells impacting directly against the shoreline. The combination of wind and waves on the shoreline creates a highly energy charged environment. On the day the photos were taken, the weather was unusually calm, with slight Kona winds and no visible plumes from the streams, so no estimate of shoreline current direction or velocity could be made. The height of the vegetation belt up on the cliff face suggests that during normal tradewind weather the wave and splash zone is tens of feet above sea level. It does not appear reasonable to conduct a marine benthic survey or to install sedimentation meters at this outfall because the high shoreline energy and deep water immediately adjacent to shore would appear to preclude the possibility of any significant sedimentation accumulating on the benthic substrate to the extent that it could compromise the growth of corals or adversely impact other marine species.

Oceanit Center 828 Fort Street Mall, Suite 600 Honolulu, Hawaii 96813 Phone: 808.531.3017 Fax: 808.531.3177
www.oceanit.com



Map 1. Kolea Stream and vicinity. Note that there are two streams called Kolea in the area.

Photo #1. View of Kolea Stream vegetation looking north (downstream of Hana Highway).

Photo #2. View of Kolea Stream 30+ feet below looking from atop the ridge.

Photo #3. View of waterfall on Kolea Stream

Photo #4. View of cliff face.

Photo #5. View looking down rock cliff to ocean approximately 300 feet below.

Photo #6. View of boulder beach below Kolea Stream, wave action, and deep waters.

APPENDIX I:

DEA Comment Letters and Responses

CHARMAINE TAVARES
Mayor

TAMARA HORCAJO
Director

ZACHARY Z. HELM
Deputy Director

(808) 270-7230
FAX (808) 270-7934

DEPARTMENT OF PARKS & RECREATION

700 Hali'a Nakoa Street, Unit 2, Wailuku, Hawaii 96793

October 5, 2010

Derrick Elfalan, PE
Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

RE: Kolea Reservoir (HI00097) Removal Project

Dear Mr. Elfalan,

Thank you for the opportunity to review and comment on the Draft Environmental Assessment for the Kolea Reservoir Removal Project.

After review of the submitted draft environmental assessment document, we have no comment to offer concerning the reservoir removal project at this time.

Should you have any questions, please feel free to contact me, or Mr. Robert Halvorson, Capital Improvement Project Coordinator at 808.870.5942 or robert.halvorson@co.maui.hi.us

Sincerely,

TAMARA HORCAJO
Director of Parks & Recreation

c: Laura Thielen, Chairperson, Department of Land and Natural Resources
Office of Environmental Quality Control

TH:PTM:rh

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3023.1

Ms. Tamara Horcajo
Director
Department of Parks and Recreation
County of Maui
700 Halia Nakoa Street, Unit 2
Wailuku, Hawai'i 96793

Dear Ms. Horcajo:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of October 5, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, HONOLULU
FORT SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF:

October 14, 2010

Regulatory Branch

File Number POH-2010-00112

Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Attention Addressee:

This letter is in response to your request dated September 27, 2010 for Department of the Army review of the Draft Environmental Assessment (DEA) for the Kolea Reservoir Removal Project in Hana, Island of Maui, Hawaii. We have assigned the project the reference number POH-2010-00112. Please cite the reference number in any future correspondence concerning this project. We completed our review of the submitted document pursuant to Section 10 of the Rivers and Harbors Act of 1899 (Section 10) and Section 404 of the Clean Water Act (Section 404).

Section 10 requires that a Department of the Army (DA) permit be obtained from the U.S. Army Corps of Engineers (Corps) prior to undertaking any construction, dredging and other activities occurring in, over, or under navigable waters of the U.S. The line of jurisdiction extends to the Mean High Water Mark (MHWM) for tidal waters. Section 404 requires that a DA permit be obtained for the discharge (placement) of dredge and/or fill material into waters of the U.S., including wetlands. The line of jurisdiction extends to the Mean Higher High Water Mark (MHHWM) for tidally influenced waters, the Ordinary High Water Mark (OHWM) for non-tidal waters and the approved delineated boundary for wetlands.

On June 8, 2010, this office determined that the Kolea Stream is a water of the United States, subject to Corps jurisdiction and as such, a DA permit will be required for the "grading and placement of riprap" associated with the dam removal. Based on our review of the DEA, we have determined that the proposed temporary installation of the sandbag barrier will also require a DA permit prior to commencement of the proposed activity.

To avoid any unintentional violation to federal law and regulations, we advise the property owner to submit a DA permit application, available at *http://poh.usace.army.mil/EC-R/EC-R.htm*, and associated drawings relative to the proposed work. The Corps will then review the application to ensure it complies with all necessary federal laws and regulations. Note that if the fill results in the loss of waters of the U.S. and/or associated functions, the applicant may be required to provide compensatory mitigation for any unavoidable impacts.

Thank you for contacting us regarding this project and providing us with the opportunity to comment. Should you have any questions, please contact Ms. Jessie Pa'ahana at *808.438.0391* or via email at *Jessie.K.Paahana@usace.army.mil*. You are encouraged to provide comments on your experience with the Honolulu District Regulatory Branch by accessing our web-based customer survey form at *http://per2.nwp.usace.army.mil/survey.html*.

Sincerely,

George P. Young, P.E.
Chief, Regulatory Branch

Enclosure

Copy furnished (w/out enclosure):
Laura Thielen, Department of Land and Natural Resources, Kalanimoku Building, 1151 Punchbowl Street, Honolulu, , Inc., 828 Fort Street Mall, Suite 600, Honolulu, Hawaii 96813

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3024.1

Mr. George Young, PE
Chief
Regulatory Branch
U.S. Army Corps of Engineers
Department of The Army
Fort Shafter, Hawai'i
Honolulu, Hawai'i 96858-5440

Dear Mr. Young:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050
Reference Number: POH-2010-00112

This letter is in response to your comment letter of October 14, 2010 for the subject project. We appreciate your review of the Environmental Assessment (EA).

We will obtain a Section 404 permit for this project since we will be modifying waters of the United States. The permit will include grading and placement of riprap, the sandbag barrier and the placement of fill material, which includes rocks and soil.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

LINDA LINGLE
GOVERNOR

THEODORE E. LIU
DIRECTOR

DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM

No. 1 Capitol District Building, 250 South Hotel Street, 5th Floor, Honolulu, Hawai'i 96813
Mailing Address: P.O. Box 2359, Honolulu, Hawai'i 96804
Web site: www.Hawai'i.gov/dbedt

Telephone: (808) 586-2355
Fax: (808) 586-2377

November 22, 2010

Mr. Derrick Elfalan, P.E.
Senior Projects Engineer
Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, Hawai'i 96813

Re: Draft Environmental Assessment for the Proposed Kolea Reservoir (HI00097) Removal Project; Hana, Maui

Dear Mr. Elfalan:

In response to your October 18, 2010 notice, thank you for the opportunity to provide comments on the Draft Environmental Assessment (DEA) for the proposed removal of the Kolea Reservoir. This project proposes to remove the Kolea Reservoir because it is no longer needed for irrigation. Chapter 343, Hawai'i Revised Statutes (HRS), environmental review is required because Kolea Reservoir is located on land owned by the State of Hawai'i, under the control of the Department of Land and Natural Resources (DLNR), and is within a Conservation District.

There are no potential impacts on electrical service utilities, and the proposed mitigation measures are discussed within the DEA. At this time, the Hawai'i State Energy Office within the Department of Business, Economic Development and Tourism (DBEDT) has no comments on the proposed project.

Our website (http://Hawaii.gov/dbedt/info/energy) provides detailed information on guidelines, directives, and statutes, as well as studies and reports on aspects of energy efficiency and renewable energy. Please do not hesitate to contact Carilyn Shon, Energy Conservation and Efficiency Branch Manager, at (808) 587-3810, for additional information on energy efficiency, and Maria Tome, Renewable Energy Branch Manager, at (808) 587-3809, for information on renewable energy resources.

Sincerely,

Theodore A. Peck
Administrator, Hawai'i State Energy Office

TAP/cbb

c: OEQC
Ms. Laura Thielen - Chairperson, Department of Land and Natural Resources
C. Shon, DBEDT-SID
M. Tome, DBEDT-SID

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3025.1

Mr. Theodore A. Peck
Administrator
Hawai'i State Energy Office
Department of Business Economic Development & Tourism
State of Hawai'i
P.O. Box 2359
Honolulu, Hawai'i 96804

Dear Mr. Peck:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of November 22, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

CHARMAINE TAVARES
Mayor

CHERYL K. OKUMA, Esq.
Director

GREGG KRESGE
Deputy Director

TRACY TAKAMINE, P.E.
Solid Waste Division

DAVID TAYLOR, P.E.
Wastewater Reclamation Division

COUNTY OF MAUI
DEPARTMENT OF
ENVIRONMENTAL MANAGEMENT
2200 MAIN STREET, SUITE 100
WAILUKU, MAUI, HAWAII 96793

October 15, 2010

Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96793

SUBJECT: **KOLEA RESERVOIR (HI00097) REMOVAL PROJECT**
DRAFT ENVIRONMENTAL ASSESSMENT
TMK (2) 1-1-001:050, HANA

We reviewed the subject application and have the following comments:

1. Solid Waste Division comments:

   a. None.

2. Wastewater Reclamation Division (WWRD) comments:

   a. None.

If you have any questions regarding this memorandum, please contact Gregg Kresge at 270-8230.

Sincerely,

CHERYL K. OKUMA
Director of Environmental Management

xc: Laura Thielen, Chairperson
Department of Land and Natural Resources

Derrick Elfalan , Senior Projects Engineer
Oceanit Laboratories, Inc.

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3026.1

Ms. Cheryl K. Okuma
Department of Environmental Management
County of Maui
2200 Main Street, Suite 100
Wailuku, Hawai'i 96793

Dear Ms. Okuma:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letters of October 15, 2010 and November 10, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal and for circulating the document for comments from the other Divisions.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

DEPARTMENT OF
HOUSING AND HUMAN CONCERNS
HOUSING DIVISION
COUNTY OF MAUI

CHARMAINE TAVARES
Mayor
LORI TSUHAKO
Director
JO-ANN T. RIDAO
Deputy Director

35 LUNALILO STREET, SUITE 102 • WAILUKU, HAWAII 96793 • PHONE (808) 270-7351 • FAX (808) 270-6284

November 19, 2010

Ms. Laura Thielen
Chairperson
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, HI 96813

Dear Ms. Thielen:

Subject: **Draft Environmental Assessment for the Kolea Reservoir (HI00097) Removal Project located in Hana, Maui. TMK: (2) 1-1-001:050**

The Housing Department has reviewed the Draft Environmental Assessment for the above subject project. Based on our review, we have determined that the subject project is not subject to Chapter 2.96, Maui County Code. The Department has no additional comments to offer at this time.

Please call Mr. Buddy Almeida of our Housing Division at 270-7356 if you have any questions.

Sincerely,

Wayde T. Oshiro

WAYDE T. OSHIRO
Housing Administrator

cc: Director of Housing and Human Concerns
Derrick Elfalan, Oceanit Laboratories, Inc. ✓

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3027.1

Mr. Wayde T. Oshiro
Housing Administrator
Department of Housing and Human Concerns
County of Maui
35 Lunalilo Street, Suite 102
Wailuku, Hawai'i 96793

Dear Mr. Oshiro:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of November 19, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

CHARMAINE TAVARES
MAYOR

DON A. MEDEIROS
Director
WAYNE A. BOTEILHO
Deputy Director
Telephone (808) 270-7511
Facsimile (808) 270-7505

DEPARTMENT OF TRANSPORTATION

COUNTY OF MAUI
200 South High Street
Wailuku, Hawaii, USA 96793-2155

September 29, 2010

Mr. Derrick Elfalan
Senoir Project Engineer
Oceanit Laboratories
828 Fort Street Mall Suite 600
Honolulu, Hawaii 96813

Subject: Kolea Reservoir Removal Project

Dear Mr. Elfalan,

Thank you for the opportunity to comment on this project. We have no comments to make at this time.

Please feel free to contact me if you have any questions.

Sincerely,

Don Medeiros
Director

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3028.1

Mr. Don Medeiros
Director
Department of Transportation
County of Maui
200 South High Street
Wailuku, Hawai'i 96793-2155

Dear Mr. Medeiros:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of September 29, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal. We were informed by the State Department of Transportation (DOT) that the selected contractor will need to obtain a permit from the DOT Highways Division, Maui District Office, if oversized and overweight equipment/loads are used on State highway facilities.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

LINDA LINGLE
GOVERNOR

MICHAEL D. FORMBY
INTERIM DIRECTOR

Deputy Directors
FRANCIS PAUL KEENO
JIRO A. SUMADA

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

STP 8.0272

November 1, 2010

Mr. Derrick Elfalan, P.E.
Senior Projects Engineer
Oceanit Laboratories, Inc.
828 Fort Street Mall, Suite 600
Honolulu, Hawaii 96813

Dear Mr. Elfalan:

Subject: Kolea Reservoir Removal Project
Draft Environmental Assessment (DEA)

Thank you for requesting the State Department of Transportation's (DOT) review of the subject project.

DOT understands that the Department of Land and Natural Resources (DLNR) will be removing the Kolea Reservoir. The reservoir will be graded by breaching the dam to form a 15-foot wide earth channel with 2:1 sloping sides. On the downstream side of the reservoir, a grouted riprap apron will be constructed to allow the stream water to flow into Kolea Stream. Equipment and staging areas will be located in the vicinity of the reservoir.

Given the project's location, DOT does not anticiapte any significant, adverse impacts to its transportation facilties (Hana Highway); however, the applicant should be informed that a permit is required from DOT Highways Division, Maui District Office, to transport oversized and overweight equipment/loads within the State highway facilities.

DOT appreciates the opportunity to provide comments. If there are any other questions, including the need to meet with DOT staff, please contact Mr. David Shimokawa of the DOT Statewide Transportation Planning Office at telephone number (808) 831-7976.

Very truly yours,

Francis Paul Keeno

for MICHAEL D. FORMBY
Interim Director of Transportation

c: Katherine Kealoha, Office of Environmental Quality Control

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3029.1

Mr. Michael D. Formby
Interim Director of Transportation
Department of Transportation
State of Hawai'i
869 Punchbowl Street
Honolulu, Hawai'i 96813-5097

Dear Mr. Formby:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of November 1, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal. The selected contractor will obtain the permit from the DOT Highways Division, Maui District Office, if oversized and overweight equipment/loads are used on State highway facilities.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

LINDA LINGLE
GOVERNOR

XXXXXXXXXXXXXXXXXXX
PATRICIA HAMAMOTO
XXXXXXXXXXXXXXX
SUPERINTENDENT

KATHRYN S. MATAYOSHI
SUPERINTENDENT

STATE OF HAWAI'I
DEPARTMENT OF EDUCATION
P.O. BOX 2360
HONOLULU, HAWAI'I 96804

OFFICE OF THE SUPERINTENDENT

October 21, 2010

TO: Ms. Katherine P. Kealoha, Director
Office of Environmental Quality Control
Department of Health

FROM: Kathryn S. Matayoshi, Superintendent
Department of Education

SUBJECT: Review of Draft Environmental Assessment for the
Removal of Kolea Reservoir (Hi00097)

The Department of Education has reviewed the Draft Environmental Assessment Report for the removal of Kolea Reservoir. Based on our review of the draft report, we do not have comments to offer at this time.

Should you have any questions, please do not hesitate to call Roy Ikeda of the Facilities Development Branch at 377-8310.

KSM:RI:to

c: The Honorable Laura Thielen, Chairperson, DLNR
√Derrick Elfalan, Senior Project Engineer, Oceanit

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3030.1

Ms. Kathryn S. Matayoshi
Superintendent
Department of Education
State of Hawai'i
P.O. Box 2360
Honolulu, Hawai'i 96804

Dear Ms. Matayoshi:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of October 21, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc. ✓
DLNR, Russell Tsuji

LINDA LINGLE
GOVERNOR
STATE OF HAWAI'I

KAULANA H. R. PARK
CHAIRMAN
HAWAIIAN HOMES COMMISSION

ANITA S. WONG
DEPUTY TO THE CHAIRMAN

ROBERT J. HALL
EXECUTIVE ASSISTANT

STATE OF HAWAI'I
DEPARTMENT OF HAWAIIAN HOME LANDS
P.O. BOX 1879
HONOLULU, HAWAI'I 96805

October 8, 2010

Laura Thielen, Chairperson
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Ms. Thielen:

Title of Project: Kolea Reservoir (H100097) Removal Project
Location: Island of Maui, Hana
Tax Map Key Numbers: (2) 1-1-001:050
Agency Action: Department of Land and Natural Resources

Thank you for the opportunity to review the subject proposal.

The Department of Hawaiian Home Lands has no comment to offer at this time. If you have any questions, please contact our Planning Office at (808) 620-9480.

Aloha and mahalo,

Kaulana H.R. Park, Chairman
Hawaiian Homes Commission

Cc: Oceanit Laboratories, Inc.
Mr. Derrick Elfalan, PE
Senior Projects Engineer

LINDA LINGLE
GOVERNOR
STATE OF HAWAI'I

KAULANA H. R. PARK
CHAIRMAN
HAWAIIAN HOMES COMMISSION

ANITA S. WONG
DEPUTY TO THE CHAIRMAN

ROBERT J. HALL
EXECUTIVE ASSISTANT

STATE OF HAWAI'I
DEPARTMENT OF HAWAIIAN HOME LANDS

P.O. BOX 1879
HONOLULU, HAWAI'I 96805

October 25, 2010

Oceanit Laboratories, Inc.
Mr. Derricek Elfalan, PE
Senior Projects Engineer
Suite 600
828 Fort Street Mall
Honolulu, Hawaii 96813

Dear Mr. Elfalan:

TITLE PROJECT: Kolea Reservoir (HI00097) Removal Project
Location: Island of Maui, Hana
Tax Map Key: (2) 1-1-001:050
Agency Action: Department of Land and Natural Resources

Thank you for the opportunity to review the subject proposal.

The Department of Hawaiian Home Lands has no comment to offer at this time. If you have any questions, please contact our Planning Office at (808) 620-9480.

Aloha and mahalo,

for Kaulana H.R. Park, Chairman
Hawaiian Homes Commission

CC: Laura Thielen, Chairperson
Department of Land and Natural Resources

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3031.1

Mr. Kaulana H.R. Park
Chairman
Hawaiian Homes Commission
Department of Hawaiian Home Lands
State of Hawai'i
P.O. Box 1879
Honolulu, Hawai'i 96805

Dear Mr. Park:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letters of October 8, 2010 and October 25, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

CHARMAINE TAVARES
Mayor

JEFFREY K. ENG
Director

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauiwater.org

November 22, 2010

Mr. Derrick Elfalon
Oceanit Laboratories
828 Fort Street Mall, Suite 600
Honolulu, HI 96813

Re: I.D.: Draft Environmental Assessment (DEA) (HI00097)
TMK: (2) 1-1-001:050
Project Name: Kolea Reservoir Removal

Dear Mr. Elfalon:

Thank you for the opportunity to comment on this reservoir removal project.

The project area lies outside the Department of Water Supply (DWS) service area, so our comments will be limited in scope.

The DEA states that "Deconstruction of the project will have a positive impact on water resource development because the reservoir will no longer store water for the purpose of agriculture irrigation" (Section 7.1.3, page 32). While this stream restoration project will likely have a positive impact upon water resources, there may not necessarily be a link between less agricultural irrigation in the project area, and water resource development locally, or elsewhere.

Should you have any questions, please contact our Water Resources and Planning Division at 244-8550.

Sincerely,

Jeffrey K. Eng, Director
bab

cc: engineering division

"By Water All Things Find Life"

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3032.1

Mr. Jeffrey K. Eng
Director
Department of Water Supply
County of Maui
200 South High Street
Wailuku, Hawai'i 96793

Dear Mr. Eng:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of November 22, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kōlea Reservoir removal. We concur that there may not be a direct link to less agricultural irrigation and water resources development. A downstream diversion on the Kōlea Stream is still in place.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

ALAN M. ARAKAWA
Mayor
WILLIAM R. SPENCE
Director
MICHELE CHOUTEAU McLEAN
Deputy Director

COUNTY OF MAUI
DEPARTMENT OF PLANNING

January 10, 2011

Mr. William Aila, Interim Chairperson
Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, Hawaii 96813

Dear Ms. Thielen:

SUBJECT: REQUEST FOR COMMENT (RFC) ON KOLEA RESERVOIR (HI00097) REMOVAL PROJECT DRAFT ENVIRONMENTAL ASSESSMENT (EA) LOCATED AT KOLEA, HANA, MAUI, HAWAII; TMK: (2) 1-1-001:050 (EAC 2010/0014) (RFC 2010/0064)

The Department of Planning (Department) is in receipt of your October 19, 2010, RFC on Kolea Reservoir (HI00097) Removal Project Draft EA. The project is subject to the Coastal Zone Management Act and Hawaii Revised Statutes (HRS), Chapter 205A must be observed.

Additionally, the Department requests that the State of Hawaii Department of Land and Natural Resources address any potential inconsistencies with the County of Maui Countywide Policy Plan (March 2010).

Thank you for your cooperation. The Department would like the opportunity to comment on the Final EA when available. If additional clarification is required, please contact Staff Planner Anna Benesovska at anna.benesovska@mauicounty.gov or at (808) 463-3867.

Sincerely,

CLAYTON I. YOSHIDA, AICP
Planning Program Administrator

for WILLIAM SPENCE
Planning Director

xc: Anna N. Benesovska, Staff Planner
Derrick Elfalan, PE, Senior Projects Engineer, Oceanit Laboratories, Inc.
RFC File (1 Copy)
Project File
General File

WRS:CIY:ANB:sa
K:\WP_DOCS\PLANNING\EAC\2010\0014_DAGSKoleaDamReservoir\comment.doc

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 1 2011

PM-3033.1

Mr. William Spence
Planning Director
Department of Planning
County of Maui
250 South High Street
Wailuku, Hawai'i 96793

Dear Mr. Spence:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of January 10, 2011 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment for the Kolea Reservoir removal. A Coastal Zone Management Federal Consistency Review will be submitted for the project. A County of Maui Countywide Policy Plan (March 2010) section will be added to the Environmental Assessment to address any potential inconsistencies. The final copy of the Environmental Assessment will be sent to you for review.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc.
DLNR, Russell Tsuji

LINDA LINGLE
GOVERNOR OF HAWAII

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

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

In reply, please refer to:
EMD / CWB

10018PJF.10

October 11, 2010

Ms. Katherine Kealoha
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Kealoha:

SUBJECT: Draft Environmental Assessment (DEA) for Kolea Reservoir (HI00097) Removal Project Hana, Island of Maui, Hawaii TMK: (2) 1-1-001:050

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

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

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

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

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

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

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

   b. Construction dewatering effluent.

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

3. For types of wastewater not listed in Item No. 2 above or wastewater discharging into Class 1 or Class AA waters, you may need an NPDES individual permit. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at: http://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html.

4. Please contact the Army Corps of Engineers, Regulatory Branch (Tel. No.: (808)438-9258) to determine if this project requires a Section 404 Permit. Pursuant to Federal Water Pollution Control Act (commonly known as the "Clean Water Act" (CWA)), Paragraph 401(a)(1), a Section 401 Water Quality Certification (WQC) is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may **result** in any discharge into the navigable waters..." (Emphasis added). The term "discharge" is defined in CWA, Subsections 502(16), 502(12), and 502(6); Title 40, Code of Federal Regulations, Section 122.2; and HAR, Chapter 11-54.

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

If you have any questions, please visit our website at: http://www.hawaii.gov/health/environmental/water/cleanwater/index.html, or contact the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

for ALEC WONG, P.E., CHIEF
Clean Water Branch

JF:ml

c: DOH-EPO #I-3357 [via email only]
Ms. Laura Thielen, Department of Land and Natural Resources
Mr. Derrick Elfalan, Oceanit Laboratories, Inc

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 4 2011

PM-3036.1

Mr. Alec Wong, P.E.
Chief
Clean Water Branch
Department of Health
State of Hawai'i
P.O. Box 3378
Honolulu, Hawai'i 96801-3378

Dear Mr. Wong:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of October 11, 2010 for the subject project. The responses below follow the same numbering system used in your letter:

1. The project will be implemented to meet the requirements of the Hawai'i Administrative Rules (HAR), Chapters 11-54 and 11-55.

2. A National Pollutant Discharge Elimination System (NPDES) permit application will be submitted to the Department of Health (DOH) for approval prior to the construction of the project.

3. The discharge point of the Kōlea Stream into the ocean is into Class AA waters. The project site is located approximately one mile mauka of the stream mouth. For the purpose of the Water Quality Certification, the discharge for this project will be soil and rocks taken from the breached dam to fill in the reservoir and to restore the stream within this vicinity to flow naturally. The disturbed area will be grassed and the stream water will not be released until the grass has been established. The diversion ditch below the reservoir will continue to divert the stream water into the irrigation system.

4. The Army Corps of Engineers has been consulted and they have determined that the Kōlea Stream is a water of the United States and a Section 404 Permit will be required for the project.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc. ✓
DLNR; Russell Tsuji, Administrator

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Pacific Islands Regional Office
1601 Kapiolani Blvd., Suite 1110
Honolulu, Hawaii 96814-4700
(808) 944-2200 · Fax: (808) 973-2941

October 27, 2010

Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

To Whom It May Concern:

Thank you for providing the Habitat Conservation Division of NOAA Fisheries Pacific Islands Regional Office (PIRO) with the opportunity to participate in the draft Environmental Assessment review process for the Kolea Reservoir Removal Project on Maui. The preferred alternative involves breaching the dam to form a 15-foot wide earth channel with 2:1 sloping sides. On the downstream side of the reservoir, a grouted riprap apron will be constructed to allow the stream water to flow into Kolea Stream in the vicinity where the existing spillway currently flows into the stream.

In order to fully evaluate the potential impacts to Coral Reef Essential Fish Habitat (EFH) (section 305(b)(4)(A)of the Magnuson-Stevens Fishery Conservation and Management Act), PIRO suggests additional information be included in the Final Environmental Assessment. These recommendations are overlapping and/or build off our pre-consultation comments provided in an earlier e-mail to Joanna Hiramitsu dated 5/17/2010:

1) Include a description of whether and how the least environmentally damaging alternative has been chosen, e.g. whether the alternative using minimal hard structures, retaining to the greatest extent the natural characteristics of the stream, has been considered. As it stands now, only one alternative has been proposed beyond the no action alternative.
2) Provide a preferably quantitative prediction of potential impacts to stream turbidity, i.e. if/how the preferred alternative (both during and post construction) might lead to increased sediment/pollution loading in the stream and hence discharge in to the ocean.
3) Provide a better description of the marine benthic resources (EFH) that are found at the mouth of the stream. An inference that the prevailing oceanic conditions limit coral growth and a statement that no coral are known to be present at the mouth is not appropriate without either conducting a survey of the area to support this, or alternatively summarizing and referring to another study addressing this.

4) Clarify how effective the avoidance and minimization measures that will be implemented to reduce and limit sediment/pollution input to the stream and thus ocean are expected to be.

Again, we appreciate the opportunity to comment on this project, please contact Danielle Jayewardene at 808-944-2162 if you have any questions.

Sincerely,

Alan Everson
Acting Assistant Regional Administrator
PIRO Habitat Conservation Division

Copies furnished:

- Laura Thielen, Chairperson, Department of Land and Natural Resources, Kalanimoku Bldg, 1151 Punchbowl St, Honolulu, HI 96813
- Derrick Elfalan, PE Senior Project Engineer, Oceanit Laboratories Inc, 828 Fort Street Mall, Suite 600, Honolulu, HI 96813
- U.S Environmental Protection Agency, Region 9, P.O. Box 50003, Honolulu, HI 96850
- U.S. Fish and Wildlife Service, Environmental Services, P.O. Box 50088, Honolulu, HI 96850
- State of Hawaii, Department of Land and Natural Resources, Division of Aquatic Resources, P.O. Box 621, Honolulu, HI 96809

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 4 2011

PM-3035.1

Mr. Alan Everson
Acting Assistant Regional Administrator
PIRO Habitat Conservation Division
Pacific Islands Regional Office
National Marine Fisheries Service
National Oceanic and Atmospheric Administration
1601 Kapiolani Boulevard, Suite 1110
Honolulu, Hawai'i 96814-4700

Dear Mr. Everson:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of October 27, 2010 and subsequent emails (Attachment 1) for the subject project. We appreciate your review of the Environmental Assessment (EA).

The only other alternative that was considered for this reservoir was to repair the dam. However, the alternative was not considered the best alternative for two reasons: 1) the cost to repair the dam was too high; and 2) the dam was no longer needed to store water in the reservoir for irrigation purposes. We will add this alternative to the Environmental Assessment (EA).

The Best Management Practices that are planned for the project will control sediment runoff during and after construction. The stream water will not be released into the area designed to restore the natural course of the stream through the reservoir area until the vegetation has been established. In addition, the check dams will trap sediment before flowing downstream and water quality monitoring will also be conducted for one week after the stream reestablishes the new alignment.

With regards to the marine benthic resources and essential fish habitat (EFH), a site visit to the mouth of the Kōlea Stream was conducted and a report was submitted (see Attachment 2). Also note that the length of the stream that will be restored is only 570 feet long and is approximately a mile inland from the stream mouth.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc. ✓
DLNR; Russell Tsuji, Administrator

Joanne Hiramatsu

Subject: FW: Comments on Kolea EA
Attachments: Fabricius 2005 Review runoff effect on coral.pdf; Rogers 1990 Review sedimentation to coral.pdf; Storlazzi et al 2011 use of sediment traps on reefs.pdf

From: Danielle Jayewardene [mailto:Danielle.Jayewardene@noaa.gov]
Sent: Tuesday, January 18, 2011 11:10 AM
To: Joanne Hiramatsu
Cc: Robert Bourke; Derrick Elfalan; alan.everson; Gerry.Davis@noaa.gov; mark.a.yamabe@hawaii.gov; Lydia.M.Morikawa@hawaii.gov
Subject: Re: Comments on Kolea EA

Hi Joanne,

Thanks for the contacts at DAGS and DLNR: I have cc'd them on this message as we like to keep the line of communication open with the applicants of projects.

Good question, but unfortunately we do not have written guidelines or standards that I can point you to for sedimentation rates, grain size and/or type of sediment that would have an adverse effect on Coral reef EFH (definition = all substrate down to 100m depth and water column down to 200m depth from shoreline out to EEZ boundary). The sedimentation effect to coral (important component of Coral Reef EFH) varies dependent on the species of coral being affected, the sediment type, the prevailing environmental conditions etc. The attached papers and link
(http://walrus.wr.usgs.gov/coralreefs/pubs.html#papers) may be
informative: the Fabricius 2005 paper section on sedimentation perhaps addresses your questions most specifically.

I haven't received the benthic data yet, but I will forward it to you as soon as I receive it. You are of course welcome to contact our Science Center directly if you wish (http://www.pifsc.noaa.gov/cred/index.php).
They continuously collect ecological and oceanographic data from the Pacific which is available to the public, a useful resource in general.

Aloha
Danielle

Joanne Hiramatsu wrote:
> Hi Danielle:
>
> Thanks. Looking forward to receiving the studies you discovered. Are there standards or guidelines for what concentrations, size, and type of silt (organic/inorganic) that would have an adverse impact to EFH species? If so, can you provide to us or direct me to the site that I can download?
>
> The contact persons at DAGS and DLNR follows:
>
> Mark A. Yamabe
> Project Management Branch
> Dept. of Accounting and General Services (DAGS)
> 1151 Punchbowl Street, Room 427
> Honolulu, HI 96813
> mark.a.yamabe@hawaii.gov
> Phone: (808) 586-0469

> Fax: (808) 586-0530
>
> Lydia Morikawa
> Land Manager
> DLNR - Land Branch
> 1151 Punchbowl Street
> Honolulu, HI 96813
> Phone: (808) 587-0410
> Fax: (808) 587-0422
> Email: Lydia.M.Morikawa@hawaii.gov
>
> Thanks,
> Joanne
>
> Joanne Hiramatsu | Oceanit | Manager, Environmental Engineering & Planning
> Senior Planner, Project Manager
> 828 Fort. St. Mall. Suite 600. Honolulu, HI 96813
> P: 808.531.3017 x262| F: 808.531.3177| Direct: 808.954.4262| Cell: 808.222.2602
> E: jhiramatsu@oceanit.com
> Click4 | Map | Video | Website | Careers
>
> NEWS: Watch "Weird Science with Dr. V" every Tues at 6:40am on KGMB9
>
> P Please consider the environment before printing this message
>
> NOTICE TO RECIPIENT: This message may contain confidential or privileged information and any unauthorized use, disclosure or copying of this message or its contents is prohibited. If you are not the intended recipient, please reply to advise the sender of the error and immediately delete this message and any attachments from your system.
>
> -----Original Message-----
> From: Danielle Jayewardene [mailto:Danielle.Jayewardene@noaa.gov]
> Sent: Thursday, January 13, 2011 4:15 PM
> To: Joanne Hiramatsu
> Cc: Robert Bourke; Derrick Elfalan; alan.everson; Gerry.Davis@noaa.gov
> Subject: Re: Comments on Kolea EA
>
> Hi Joanne,
>
> Indeed the concern is sediment settling on sensitive benthos and/or
> increasing turbidity, i.e. reducing water quality, both impacts
> potentially adverse effects to Coral Reef Essential Fish Habitat (EFH).
>
> Most likely, there isn't an abundance of sensitive benthos at the
> mouth, and as you say probably sufficient water movement to move any
> sediment offshore pretty quick. Still, NMFS needs to ensure that best
> available science supports these statements, i.e. has been used to
> evaluate potential impacts to EFH. I am working on getting benthic
> data from NOAA's Science Center for the area, they did some benthic
> surveys in
> 2008 and 2010. I hope to have this in hand in the next couple of days.
> Can you get some data to verify your statement/observations regarding
> the oceanic conditions along that coast?
>
> Also, could you please forward us the contact information for project
> managers at DAGS and DLNR?
>

> Thanks,
> Danielle
>
> Joanne Hiramatsu wrote:
>
>> Happy New Year Danielle:
>>
>> Thanks for your response. I tried searching for benthic surveys in this region, but only found studies done on the southern coast of Maui and found none on the northern coast in the vicinity of the Kolea Stream mouth. If you do find something, would appreciate if you can share the studies with me.
>>
>> I believe the concern at the mouth of Kolea Stream was sediment settling on coral. With the wave action along the coast, even on a calm day as shown in the memo photos, we feel that the wave action will quickly move sediment offshore and mix rapidly, rather than settling on any coral that may be present.
>>
>> DAGS is the administrator of the contract, but DLNR is the owner and will be the approving agency.
>>
>> Joanne Hiramatsu | Oceanit | Manager, Environmental Engineering & Planning
>> Senior Planner, Project Manager
>> 828 Fort. St. Mall. Suite 600. Honolulu, HI 96813
>> P: 808.531.3017 x262| F: 808.531.3177| Direct: 808.954.4262| Cell: 808.222.2602
>> E: jhiramatsu@oceanit.com
>>
>> -----Original Message-----
>> From: Danielle Jayewardene [mailto:Danielle.Jayewardene@noaa.gov]
>> Sent: Friday, January 07, 2011 11:30 AM
>> To: Joanne Hiramatsu
>> Cc: Robert Bourke; Derrick Elfalan; alan.everson
>> Subject: Re: Comments on Kolea EA
>>
>> Hi Joanne,
>>
>> Happy New year!
>>
>> Yes I've understood this is a tricky coastline due to the cliffs and
>> high wave exposure. I've read the attached report, and indeed it is
>> clear it requires a large effort to survey the marine resources at
>> the stream mouth. As it's always best to avoid making assumption to
>> the greatest extent possible, I wonder whether you could find out
>> whether any other entities have in-situ information on benthic
>> resources from the area that you can refer to? I contacted a couple
>> of people at DAR on Maui yesterday to see if they have any insight
>> from work they've done. I also shot off an e-mail to NMFS Pacific
>> Island's Fisheries Science Center (PIFSC) Coral Reef Ecosystem
>> Division (CRED) who may have some relevant information from having done surveys along that coast by ship.
>> I will get back to you asap with any insight.
>>
>> In regards to this project, who exactly is the applicant, i.e. your
>> client? Office of Environmental quality Control? I would like to
>> include the contact person on this correspondence so they are in the loop.
>>
>> Thanks!
>> Danielle

>>
Danielle Jayewardene Ph.D.
Coral Reef Ecologist
NOAA Fisheries, Pacific Islands Regional Office
1601 Kapiolani Blvd, Suite 1110
Honolulu, HI 96814
Phone # (808) 944 2162
Fax # (808) 973 2941

>> Joanne Hiramatsu wrote:
>>
>>> Danielle:
>>>
>>> This is in regards to the comment letter (Item 3) provided for the
>>> Kolea EA for removal of a reservoir. We did a site visit to look at
>>> the stream mouth and the attached memo provides the results. Your
>>> comment No. 3 suggests that a benthic survey may be needed. However,
>>> after assessing the stream mouth conditions, we feel that conditions
>>> at the mouth of the stream precludes any coral growth in this
>>> vicinity due to the shoreline conditions. The mouth is not
>>> accessible by land and access by sea would present some safety
>>> concerns. Can you please review the attached and let us know if this
>>> information will satisfy comment No. 3? If not, we would like to
>>> meet to see how best we can address this comment.
>>>
>>> Thanks,
>>> Joanne

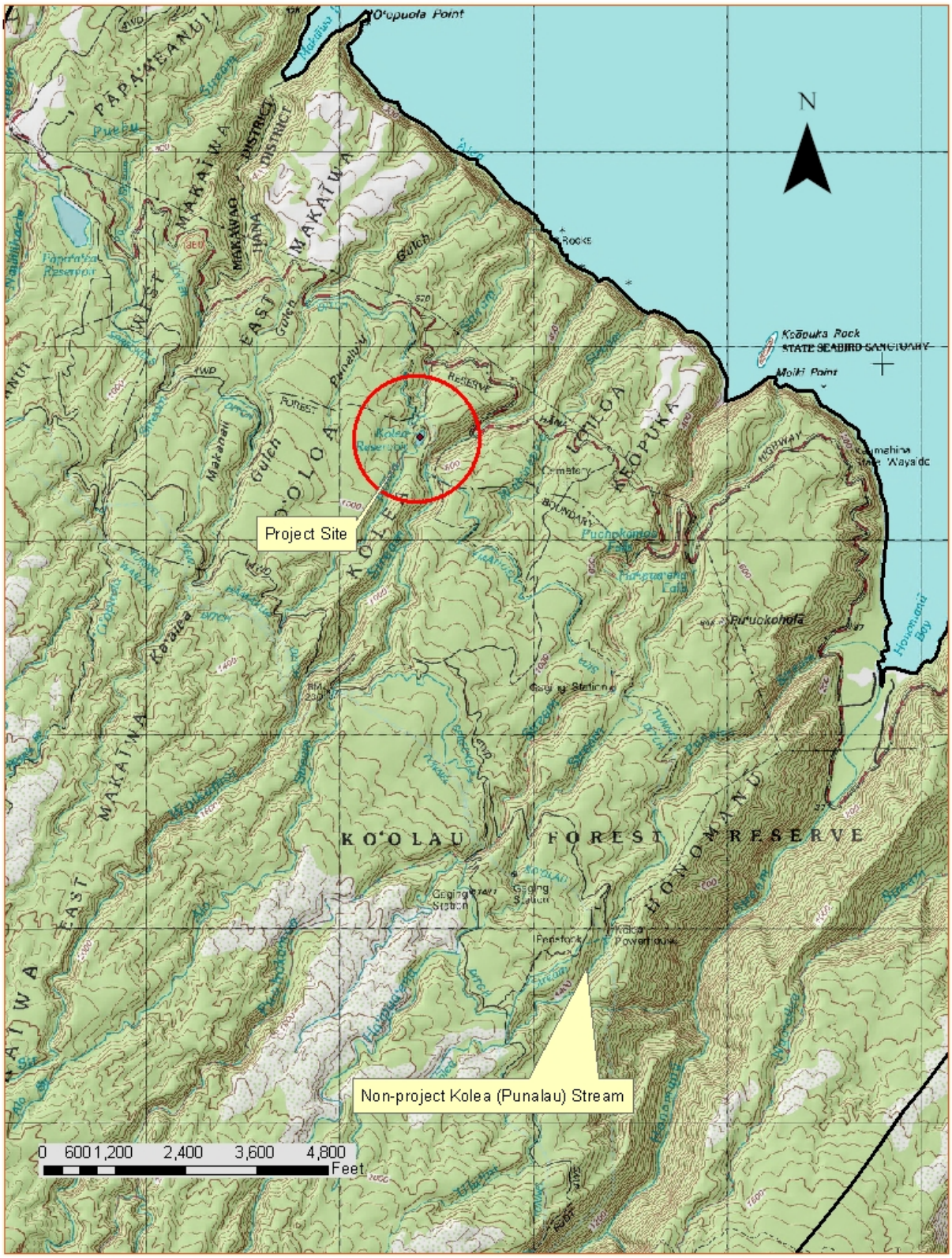
oceanit
innovation through engineering & scientific excellence

To: Derrick Elfalan, Chief, Engineering Department
From: Bob Bourke, Environmental Scientist
Date: January 5, 2010
Subject: Kolea Stream Assessment

On Thursday, December 30, 2010, John Pipan and I visited the Kolea Dam site on Maui limiting our observations below the highway to inspect the stream mouth and its ocean outfall. Pictures were taken from below Hana Highway to the mouth of Kolea Stream (see attached photos). We parked at the trail head and crossed the road to walk down the ranch road through the locked gate. The dirt road proceeds downward along the ridge top about ¼ mile past a ranch bunkhouse equipment structure. An overlook photo taken below the ranch building shows the general lush overgrown nature of the small stream valley. At about ¼ mile, before it reaches the coast, the jeep trail splits, with one branch going down either side of the ridge. We took the left fork down to the Kolea Stream. The stream bed is in a very deep (20-30 ft) gulch with almost vertical sides up to a grassy pasture area. Several photos were taken of the stream bed by leaning out and extending the camera over the chasm. Note that the extremely narrow cobble and rock stream bed with steep walls does not appear susceptible to the settlement of fine sediments.

The shoreline is an almost vertical cliff estimated to be 300 feet high (rock fall time to ocean was 4+ seconds) to the point where the stream falls over the cliff face. The cliff face is lined with Hala trees making it difficult to photograph the actual shoreline. We also accessed the trail on the other (east) side of the ridge down to a similar elevation, incised stream, and cliff face. The photos of the adjacent headland were taken from this point. Note the height of the horizon on the adjacent cliff and the character of the shoreline below. It is my opinion that accessing the stream mouth from the land side would not be practical.

The beach itself appears to consist of cliff face boulder rubble. The boulder rubble at the base of the cliff appears to be completely awash at high tide, but rapidly slopes to deep water. There is no offshore reef at this location with North Pacific swells impacting directly against the shoreline. The combination of wind and waves on the shoreline creates a highly energy charged environment. On the day the photos were taken, the weather was unusually calm, with slight Kona winds and no visible plumes from the streams, so no estimate of shoreline current direction or velocity could be made. The height of the vegetation belt up on the cliff face suggests that during normal tradewind weather the wave and splash zone is tens of feet above sea level. It does not appear reasonable to conduct a marine benthic survey or to install sedimentation meters at this outfall because the high shoreline energy and deep water immediately adjacent to shore would appear to preclude the possibility of any significant sedimentation accumulating on the benthic substrate to the extent that it could compromise the growth of corals or adversely impact other marine species.



Map 1. Kolea Stream and vicinity. Note that there are two streams called Kolea in the area.

Photo #1. View of Kolea Stream vegetation looking north (downstream of Hana Highway).

Photo #2. View of Kolea Stream 30+ feet below looking from atop the ridge.

Photo #3. View of waterfall on Kolea Stream

Photo #4. View of cliff face.

Photo #5. View looking down rock cliff to ocean approximately 300 feet below.

Photo #6. View of boulder beach below Kolea Stream, wave action, and deep waters.

MAUI TOMORROW

Protecting Maui's Future

Nov 22, 2010

Department of Land and Natural Resources
Kalanimoku Building
1151 Punchbowl Street
Honolulu, HI 96813

RE: Comments on DEA Kolea Reservoir Removal, Hana, Maui

Thank you for the opportunity to offer comments on the proposed project.
Maui Tomorrow Foundation has been active in efforts to restore stream flows in East Maui for over a decade.

We have reviewed this proposal with the hope that the project could contribute to stream health in the region, but find that essential information that would confirm that conclusion is missing from the Draft Environmental Assessment. We request that more detailed and specific information be included in the project's Final EA as required by chapter 343.

Specific information that is missing, or inadequately discussed:

Need To Remove Dam Structure:
The discussion of the dam's structural analyses does not appear to conclude that it has confirmed structural weaknesses, only that a future breach would cause impacts to Hana Highway. Is there a specific reason that the dam is known to be unsound? If so, this should be included in the FEA.

If the dam is merely being removed as a precaution, or because funding is available, that should be clearly discussed in the FEA..

Compliance with Water Resource Development Functional Plan
Objectives of the WRD Plan included in the DEA are:

Coordinate development of land use activities with existing and potential water supply;
Support research and development of alternative methods to meet future water requirements;

Reclaim and encourage the productive use of runoff water and wastewater discharges;
Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use;

Support water supply services to areas experiencing critical water problems.
Promote water conservation programs;

The DEA concludes:
Deconstruction of the project will have positive impact on water resource development because the reservoir will no longer store water for the purpose of agriculture irrigation. The reservoir that allows water to be stored will be breached so that water will flow more naturally into the stream.

This statement does not address any of the WRDFP goals stated above. In fact, the reservoir , located down slope from steeper terrain, is likely providing a way to capture stormwater runoff. The last objective of supporting water supply services to areas with critical problems is may also be contradicted by the proposed dam removal, if areas such as Huelo and Honopou that have no public water supply and have recently been granted increased stream flows in the vicinity of the Lowrie Ditch, see those stream flows impacted by loss of storage capacity in Kolea 7 miles to the east.

Relationship of Kolea Dam as part of EMI storage system.
The DEA does not discuss the rationale for lessening EMI's storage capacity by the removal of the Kolea dam and reservoir. EMI and HC&S have given repeated public testimony that during months of low rainfall they are hard pressed to have enough water for crop irrigation and County water supply demands.

The historic review section of the DEA reveals that the reservoir and dam were constructed in 1901 to harness the flows of Kolea stream to augment water supplies to HC&S's Lowrie ditch during times of low stream flows.

Low stream flow conditions still exist many months of the year in East Maui and overall average rainfall levels have dropped by up to 50% in the region, according to USGS studies.

• The EMI system demands MORE water from the east Maui streams now than it did in the early part of the 20th century. (Based on contract records with the state)

• How will the Lowrie ditch continue to receive sufficient flows for HC&S needs? This should be clearly explained and discussed in the FEA, with factual data.

Compliance with State Agricultural Functional Plan
The DEA states:
"Deconstruction of the project will have an adverse impact on agriculture because the reservoir will no longer store water for the purpose of agriculture irrigation. However, the reason the reservoir is being removed is because it is no longer needed for agricultural irrigation and for dam breach safety measures."

• The DEA concludes that "Agriculture irrigation is no longer needed from this reservoir," but does not explain why that is so. Does the reservoir leak? Is it costly to maintain? Are the ditch systems it serves (Center and Lowrie Ditch) being modified?

• Specific information about the reasons for abandoning the potential ag water storage capacity of the Kolea reservoir should be included in the FEA, otherwise it is not accurate to conclude that the proposed project complies with the State Agricultural Functional Plan.

Secondary Impacts of Reservoir Capacity Loss

• The DEA does not discuss what impacts removal of a potential 5 million gal of storage capacity from the EMI system would have on the withdrawals from other streams to the west. Will stream flows be impacted during low flows if the reservoir capacity is diminished?

• Several streams feeding the Lowrie ditch to the west (Hanehoi, Puolua and Honopou) have been given small amounts of restored flows during both low and high seasonal flows. If the Lowrie Ditch loses reservoir back up in drier times, will restored flows at these streams be impacted to make up the difference? These are secondary impacts that at the very least must be discussed in the EA.

• The DEA does not discuss if EMI has plans to make up for the lost capacity of Kolea reservoir by perhaps deepening or expanding other reservoirs. Those actions would constitute secondary impacts of this action, even if they are taking place on private lands, and should be discussed, as required our state environmental laws.

Kolea Stream Restoration

The project description is given as removal of Kolea dam and "restoration of the stream," but it is not clearly discussed how much of the stream would be "restored."

• No data is provided on what restored flow levels are expected to be and how this compares to present and historic flow levels.

• Although a brief, one-day six sample aquatic survey was conducted, it appeared to include six on-stream sites and no transects, due to high water levels. No visits were made under drier conditions, as is standard for aquatic biology. The methodology used was not consistent with that used by USGS in other east Maui stream studies, therefore conclusions could be of limited use to advance our knowledge of the area's flora and fauna.

• No discussion was included regarding potential for strategies to help increased flows improve aquatic habitat instream for invertebrates and native stream species. This information should be included in the FEA if the project is being labeled a "stream restoration."

• The Biological Survey Report theorizes that the existing ditch blocks migration of non-native species on Kolea stream from the Hana highway bridge to Kolea dam. The Report does not refer to the role of increased stream flow in clearing away non-native species from streams and does not acknowledge that non-native aquatic life can be reintroduced via ditch flows from stream to stream.

• Without clearly identifying these impacts, proper mitigations to have the proposed restoration create actual benefit to the stream, could be limited. The FEA should provide an accurate analysis of the post dam removal conditions in the stream.

• If the dam and reservoir are removed, it appears that the Kolea stream will still be intercepted by the Center ditch intake, a few hundred feet below the present Kolea dam. How much of the stream's flow is expected to be captured by this intake at high, low and median flow levels?

• No data is provided in the DEA on the water demand of the Kolea Dam reservoir system on Kolea stream historically, at present and after the proposed project. This is critical information to determine appropriate mitigations for the project's impacts.

• A series of check dams are proposed in the stream channel to combat sediment loads. Will these have any impacts on stream flows or stream life habitat? Native stream life prefers faster moving waters. Will stream velocities change after the proposed restoration? These topics should be discussed in the FEA.

• The DEA states that a "low head dam on Manual Luis ditch stream would "limit non-native fish" but not pose a threat to native fish migrations." The FEA should further explain how native fish can bypass or scale this dam and what native and non- native population counts are above and below it.

Historic Preservation:
The historic review of the dam acknowledges that the Kolea Dam and reservoir is an excellent example of its type of historic structure and is eligible for listing on the State Register.

The historic research and photo documentation done for the site is excellent, however for meaningful mitigation this material should be more widely presented to better compensate for the loss of a well-constructed and accessible remnant of an important era of Maui's history.

The history included in the project's AIS and Architectural Review should be available not just as an Appendix of the EA, but in a more widely viewable format with photo images of the dam and reservoir. At a minimum this could be posted as a specific document downloadable from the state DLNR website, and more preferably, both the download and a simple commemorative display could be created and installed at the popular Waiakamoi State Park., possibly in partnership with local historic preservation groups.

Cultural Impact Assessment
There is no discussion of whether local residents use the Kolea reservoir or stream for gathering, although extensive declarations of use of various stream resources in the region are on file with the state Water Commission as part of the Native Hawaiian legal Corp. IISF petition. The area is popular for bamboo shoot harvesting and other gathering may also take place there.

Botanical/Avian Survey
The Biological survey confuses the locations of the Manuel Luis and the Center ditches in relationship to the Kolea dam. The Manuel Luis ditch does not intercept Kolea stream. It intercepts Alo/ Waiakamoi stream in an area of higher elevation than the Kolea dam. Center Ditch is a separate structure, unconnected to Manuel Luis ditch that begins at Waiakamoi stream and terminates at Naili'iliha'ele stream in Kailua, to the west. It is located downstream of the Dam.

The Biological Survey appears limited, both in scope and in timeframe. Of especial concern is that various studies point to rare and endangered native damselflies known to be in the Waiakamoi/ Puohakamoa/ Haipuaena area,

The assessment acknowledges that the endangered native damsel fly species (M. Pacificum) has been noted in the region, but then dismisses any chance of it finding habitat in Kolea stream.

This assumption seems shortsighted since it is known that East Maui streams, below 2000" elevation, from Nahiku to Waikamoi are the last remaining habitats where these creatures have been seen. New information about their presence is added every year. The two species were proposed for listing when the Biological Survey was prepared (April 2010), but are now officially listed.

Gina Shultz, acting field supervisor of the Fish and Wildlife Service's Pacific Islands Fish and Wildlife Office was quoted in announcing the federal listing of both M. Pacificum and M Nesiotes damselflies as endangered species in June 2010: This fact should be noted in the FEA.

"We hope the added protection these colorful insects receive from endangered species status will help bring them back from the brink of extinction, but we realize the fate of Hawaiian damselflies depends on protecting, restoring and maintaining the natural health of Hawaii's streams and water systems." The Pacific Hawaiian damselfly was historically found on all of the main Hawaiian Islands except Kaho'olawe and Ni'ihau. This species is found at lower elevations, below 2,000 feet, and breeds predominantly in standing water such as marshes, ponds and pools along stream channels."

Would the Center ditch intake area below the proposed dam removal project serve as potential breeding pool habitat if it was modified? Topics like this should be included in the FEA. The FEA should also discuss what mitigations could be made to improve stream habitat to make it suitable for increased native stream and insect life. Currently the EA claims "gains in native stream habitat will not be substantial from removal of this dam." If this is a stream restoration project supported by public funds, it should provide verified benefits to public trust resources such as native flora and fauna.

Mitigations could include follow up studies on native stream life, monitoring and native species reintroduction.

Thank you for the opportunity to submit these comments. We look forward to seeing Final EA that addresses these topics.

Sincerely,

Irene Bowie

Irene Bowie
Executive Director

Cc: Oceanit, Suite 600, 828 Fort Street Mall, Honolulu, HI 96813

55 N. Church St. Ste. A5, Wailuku, HI 96793 808.244.7570 director@maui-tomorrow.org

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 4 2011

PM-3037.1

Ms. Irene Bowie
Executive Director
Maui Tomorrow
55 North Church Street, A5
Wailuku, Hawai'i 96793

Dear Ms. Bowie:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of November 22, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment (DEA) for the Kōlea Reservoir removal. The responses match the order of the bold points in your letter.

The primary purpose of the project is to remove a potentially hazardous dam. In the course of removing the dam, the stream channel in the vicinity of the dam will be restored to a more natural condition. No additional stream flow will result from removing the dam. The project will not impact regional stream health.

Need to Remove Dam Structures

The dam does not have any known structural defects. Despite this, extensive rehabilitation work would be necessary to bring the dam in compliance with the State Dam Safety Standards. The Phase I Visual Dam Inspection Report by GEI Consultants concluded that the Kōlea Reservoir is in "conditionally fair" condition. To rehabilitate this structure and have it be a viable component of East Maui Irrigation Company's (EMI) water system is extremely cost prohibitive. GEI Consultants made the following recommendations for maintaining the dam and assessing the dam's condition. Additional construction work would be required to implement the recommendations of these studies.

PRIORITY 1 RECOMMENDATIONS

1. Implement a vegetation control plan coordinated with inspections
2. Conduct a survey of the entire embankment and spillway
3. Remove slumped soil and investigate condition of buried pipe
4. Investigate condition of the outlet pipes - Repair if necessary
5. Implement a plan and schedule for monitoring seepage flows

PRIORITY 2 RECOMMENDATIONS

1. Confirm the upstream watershed drainage area
2. Conduct a Phase II Hydrology & Hydraulics Study
3. Perform a Phase II Stability Analysis
4. Update the Emergency Action Plan
5. Repair or Replace the Staff Gage

Compliance with Water Resource Development Functional Plan & the DEA concludes

The Water Resource Development Functional Plan (WRDFP) encourages the use of alternative water supplies and the reuse of storm water. Kōlea Reservoir has a capacity of about 8 million gallons and is distant from any potential users. Its small size and relative isolation make it unsuitable for storage of storm water or other alternative water sources.

Relationship of Kōlea Dam as part of the EMI storage system

Removal of the reservoir will have very little impact on the flows in the EMI system. The reservoir capacity is about 8 million gallons. The dam outlet works can be used to empty the reservoir in about one day. The dam provides a small amount of stream flow regulation upstream from EMI's stream diversion, but does not provide significant water storage for the summer dry season.

The downstream stream diversion works are not part of the project and will continue to be used to divert the Kōlea Stream water into the EMI transmission system (Lowrie Ditch). Therefore, flows in the Lowrie Ditch will not be significantly affected by the removal of the Kōlea Reservoir.

Compliance with State Agricultural Functional Plan

The reservoir is not currently used for agricultural water storage. It impounds water from the Kōlea Stream, but the water is released downstream through the outlet works or via the spillway. Water is not released directly from the reservoir into the irrigation system. We

acknowledge that Kōlea was constructed as a part of the EMI system, but it is no longer a necessary component of the system.

The reasons for removing the dam are discussed above. The ditch system served by the diversion below the reservoir will not be altered as part of this project.

The reservoir provides approximately 8 million gallons of storage and functions only to regulate the flow of the Kōlea Stream. The loss of this flow regulation function will not significantly impact the downstream agricultural uses of the stream water.

Secondary Impacts of Reservoir Capacity Loss

Neighboring streams will not be affected by the removal of the Kōlea Reservoir. The removal of the reservoir does not reduce EMI's capacity. They will continue to divert water from the Kōlea Stream.

Existing flows within neighboring streams will not be affected by the removal of the reservoir. The reservoir removal will not affect the diversion on the Kōlea Stream below the Kōlea Reservoir and EMI will continue to divert water from the Kōlea Stream. The dam removal in no way authorizes EMI to increase diversion rates at other streams.

The removal of the reservoir will not affect the operation or maintenance of the other reservoirs in their irrigation system. EMI will not need to expand the other reservoirs.

Kōlea Stream Restoration

The responses in this section are numbered according to the bullet points in your letter.

1. There are no records on historic flows in the Kōlea Stream. Flow levels are not expected to be significantly affected by the removal of the dam.

2. The biological report was not intended to be consistent with the U.S. Geological Survey (USGS) research on the East Maui streams. The primary purpose of the surveys was to determine if any biological resources of interest or concern, and particularly if any species currently listed as threatened, endangered, or proposed for listing under either the Federal or State endangered species programs, occur on or within the immediate vicinity of the Kōlea Dam, and assess whether biological resources might be impacted by removal of the dam.

3. The intent of the project is to remove the dam. After the dam embankment is partially removed, the stream channel under the existing embankment will be restored

to a condition resembling its original state. As mentioned earlier, the removal of the dam will not affect the net stream discharge.

Only the parts of the stream channel submerged by the reservoir or covered by the dam embankment would be restored. In this case, "stream restoration" means the restoration of the channel where the reservoir exists and elimination of the artificial impoundment. There will be no measurable impact on low flow stream discharge. Impacts to the stream flow from the reservoir removal will include: 1) slight increase in flow due to the decreased evapotranspiration; and 2) increase in peak storm flows due to the slight loss of storm flow attenuation provided by the dam. This is primarily a reservoir-dam removal project and only the stream channel currently inundated by the reservoir or covered by the dam embankment will be restored to a more natural condition.

4. We acknowledge that the stream increased stream flows may improve the aquatic habitat, but note that the dam removal will not affect the stream flow. We also acknowledge that the aquatic flora and fauna might be introduced via the irrigation ditch. This is stated on page 18 of the Biological Report. The irrigation ditch is entirely separate from this project and the dam removal will not affect the operation of the stream diversion.

5. It is expected that the restoration of the stream will be limited. Currently, about 200 feet of the stream channel is covered by the dam embankment and 400 feet of the stream channel is periodically inundated by the impounded reservoir. After the dam is removed, the stream will flow unimpeded through the area. The check dams will not impound significant volumes of water. The area will be grassed after grading is completed. It is expected that the bamboo from the adjacent areas will quickly reestablish in the graded areas and reservoir bottom.

6. The Center Ditch diversion is not part of this project and EMI will continue to operate the diversion. The operation of the EMI intake is not relevant to the dam removal project.

7. We agree that water demand data from the Kōlea Reservoir would be useful, but there are no data sources available on the historic water demand of the Kōlea Reservoir.

8. Stream velocities will increase after the restoration. The water velocities in the reservoir are near zero and when the dam is removed, the stream will flow through the site. The check dams are necessary to retain sediment as site vegetation establishes. The check dams are not expected to be permanent. They will be damaged by flood flows in the stream.

9. The low head dam (diversion structure) is not part of the dam removal project, therefore, it will not be altered. Discussion of the structure and its effects is not relevant.

Historic Preservation

We understand your concern about records retention and disseminating the historic information collected during this project. Currently these records are only retained at the State Historic Preservation Office.

Cultural Impact Assessment

The authors of the Cultural Impact Assessment did not find any evidence that residents were using the stream for any gathering other than for bamboo shoots.

Botanical/Avian Survey

Thank you for correcting our error. We agree that the diversion below the reservoir is into the Center Ditch, and not the Manual Luis.

The Biological Survey Report was adequate for the dam removal project. No known damsel fly habitat was discovered in the project area. The stream bed under the reservoir and dam embankment will be restored to a more natural state to allow more habitats for the damsel fly in the long run.

We understand your concerns about the Center Ditch stream diversion. As stated earlier, the stream diversion below Kōlea Reservoir is not part of this project. The diversion is an entirely different structure and it is not appropriate to discuss the stream diversion in the EA.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc. ✓
DLNR; Russell Tsuji, Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

November 8, 2010

Oceanit Laboratories, Inc.
828 Fort Street Mall Suite 600
Honolulu, Hawaii 96813

Attention: Mr. Derrick Elfalan, PE
Senior Projects Engineer

Ladies and Gentlemen:

Subject: Draft Environmental Assessment for the Kolea Reservoir (Hi00097) Removal Project

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR), Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comment.

Other than the comments from Division of Forestry & Wildlife, Commission on Water Resource Management, Office of Conservation & Coastal Lands, Engineering Division, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Historic Preservation will be submitting comments through a separate letter. Should you have any questions, please feel free to call our office at 587-0414. Thank you.

Sincerely,

Russell Y. Tsuji
Administrator

LINDA LINGLE
GOVERNOR OF HAWAII

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

RECEIVED
LAND DIVISION

2010 OCT 28 A 8:31

DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

October 25, 2010

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
__ Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division –Maui District

FROM: Charlene Unoki, Assistant Administrator Charlene
SUBJECT: Draft Environmental Assessment for the Kolea Reservoir (Hi00097) Removal Project
LOCATION: Island of Maui
APPLICANT: Oceanit on behalf of DLNR

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by November 5, 2010.

Only 1 copy of the report available in Room 220.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed:
Date: 10/27/10

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/CharleneUnoki
RE:DEAKoleaReservoirRemoval
Maui.525

COMMENTS

( ) We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone ___.

(X) Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone X. The Flood Insurance Program does not have any regulations for developments within Flood Zone X.

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

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

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

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

( ) Mr. Carter Romero at (808) 961-8943 of the County of Hawaii, Department of Public Works.

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

( ) Ms. Wynne Ushigome at (808) 241-4890 of the County of Kauai, Department of Public Works.

( ) The applicant should include water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water service from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.

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

( ) Additional Comments: _____

_____

( ) Other: _____

_____

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

Signed:_____
CARTY S. CHANG, CHIEF ENGINEER

Date:_____

LINDA LINGLE
GOVERNOR OF HAWAII

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

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
2010 NOV -4 A 11:54
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

October 25, 2010

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
__Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division –Maui District

FROM: Charlene Unoki, Assistant Administrator Charlene
SUBJECT: Draft Environmental Assessment for the Kolea Reservoir (Hi00097) Removal Project
LOCATION: Island of Maui
APPLICANT: Oceanit on behalf of DLNR

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by November 5, 2010.

Only 1 copy of the report available in Room 220.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
(✓) We have no comments.
( ) Comments are attached.

Signed: _____
Date: 11/3/10

LINDA LINGLE
GOVERNOR OF HAWAII

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

RECEIVED
LAND DIVISION
2010 NOV -4 P 12:41
DEPT OF LAND & NATURAL RESOURCES STATE OF HAWAII

2010 OCT 26 AM 9:43
COMMISSION ON WATER RESOURCE MANAGEMENT

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

October 25, 2010

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
__ Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
x Office of Conservation & Coastal Lands
x Land Division –Maui District

FROM: Charlene Unoki, Assistant Administrator Charlene

SUBJECT: Draft Environmental Assessment for the Kolea Reservoir (Hi00097) Removal Project

LOCATION: Island of Maui

APPLICANT: Oceanit on behalf of DLNR

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by November 5, 2010.

Only 1 copy of the report available in Room 220.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
(X) We have no comments.
( ) Comments are attached.

Signed: Dean Uyeno
Date: 11/4/2010

ID: RFD.2663.6
DC ID: 7091

1317
Adj

LINDA LINGLE
GOVERNOR OF HAWAII

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

MA-11-79

RECEIVED
2010 OCT 27 A 10:29
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

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

RECEIVED
2010 OCT 25 P 3:33
DEPT. OF LAND & NATURAL RESOURCES
STATE OF HAWAII

RECEIVED
OFFICE OF CONSERVATION & COASTAL LANDS

October 25, 2010

MEMORANDUM

TO: FROM

DLNR Agencies:

x Div. of Aquatic Resources
__ Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
x Div. of State Parks
x Commission on Water Resource Management
(x) Office of Conservation & Coastal Lands
x Land Division – Maui District

TO: FROM: Charlene Unoki, Assistant Administrator Charlene

SUBJECT: Draft Environmental Assessment for the Kolea Reservoir (Hi00097) Removal Project

LOCATION: Island of Maui

APPLICANT: Oceanit on behalf of DLNR

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by November 5, 2010.

Only 1 copy of the report available in Room 220.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(X) Comments are attached.

Signed: M. Mc

Date: 25 OCT 2010

LINDA LINGLE
GOVERNOR OF HAWAII

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

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

PAUL J. CONRY
ACTING FIRST DEPUTY

LENORE N. OHYE
ACTING DEPUTY DIRECTOR - WATER

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

REF:OCCL:AB

Correspondence: MA-11-79

OCT 25 2010

MEMORANDUM

TO: Charlene Unoki, Assistant Administrator
Land Division

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

SUBJECT: Draft Environmental Assessment for Kōlea Reservoir Removal
LOCATION: Hāna, Maui, TMK: (2) 1-1-001:050
APPLICANT: Oceanit for State Department of Accounting and General Services

---

The Department of Land and Natural Resources, Office of Conservation and Coastal Lands (OCCL) has reviewed the Draft Environmental Assessment (DEA) for the Kōlea Reservoir removal project, located at Hāna, Maui, TMK: (2) 1-1-001:050.

According to the DEA, the Kōlea Reservoir, which is no longer needed for storage of stream water for irrigation, will be removed and restored to a natural stream. The reservoir will be graded to form a 15-foot wide channel with 2:1 slope sides, which will be grassed. Check dams will be installed every 50 feet up to the location where the stream enters the existing reservoir. These check dams and grassing are expected to reduce the amount of sediment traveling downstream. In addition, a grouted riprap apron wall will be constructed to direct the flow downstream.

According to OCCL records, there has been no previous Conservation District Use Application (CDUA) filed for the subject parcel. The subject parcel is located within the State Land Use Conservation District, Protective and Resource Subzones.

In our previous correspondence to the applicant (Correspondence file: MA-10-229), dated May 18, 2010, the OCCL stated that:

> *The removal of the reservoir and dam is identified land use in the Conservation District pursuant to Hawai'i Administrative Rules (HAR) §13-5-22 Identified Land Uses in the Protective Subzone, P-9 STRUCTURES, EXISTING, (C-1) Demolition, removal, or alteration of existing structures, facilities, and equipment. Any historic property shall be evaluated by the department for historical significance.*

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAI'I 96810-0119

MAR 4 2011

PM-3039.1

Mr. Russell Y. Tsuji
Administrator
Land Division
Department of Land and Natural Resources
State of Hawai'i
P.O. Box 621
Honolulu, Hawai'i 96809

Dear Mr. Tsuji:

Subject: Draft Environmental Assessment
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of November 8, 2010 for the subject project. We appreciate you taking the time to review and comment on the Draft Environmental Assessment (EA) for the Kōlea Reservoir removal and for circulating the document for comments from the other Divisions.

We acknowledge that the site is within Flood Zone X and does not have any regulations for development.

A Conservation District Use Application (CDUA) will be submitted to the Office of Conservation and Coastal Lands as soon as the Final EA has been published. Page 39 of the Draft EA lists the CDUA as a requirement for this project. We will review Chapter 13-5 HAR and the CDUA requirements for incorporation into the EA.

The State Historic Preservation Division (SHPD) has been consulted and will review the documentation provided in the Draft EA. SHPD is reviewing the Architectural Inventory Survey (AIS) for adequacy of documentation before the dam features are removed.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc. ✓

In exploring these questions, we also noted some omissions, overgeneralization, and inconsistency with regard to existing planning processes, instream uses, and biologic and hydrographic characteristics of Kolea Stream. Please note that many of these concerns could be alleviated in the Final EA by liberally referencing the *Instream Flow Standard Assessment Report for Punalau Stream*, completed in 2009 by the State of Hawaii Commission on Water Resource Management, *available at* http://hawaii.gov/dlnr/cwrm/ifsar/PR200904.pdf, and related information, *see* http://hawaii.gov/dlnr/cwrm/currentissues_EastMauiIIFS.htm#punalau.

Housekeeping

The document would benefit from thorough spell checking, proofreading, and editing, as there are numerous typographical errors, grammatical mistakes, and lapses in style and organization throughout the document.

A lot of useful information is buried in the appendices where it is not readily available to all readers and is not easily understood by the non-engineering public. We suggest that the preparers extract summaries of this information and daylight it within the main body of the Final EA, using lay terms and simplified graphics. For example, Appendix B—which is unpaginated and has no table of contents—includes sketches that illustrate the reservoir and spillway features, which would be a helpful addition to the project description in the main body of the document.

In order to further assist the reader, we also suggest (1) pagination of the entire document; (2) tables of contents for the appendices that are reproduced within the main table of contents (p. iv); (3) adding tables and figures from the appendices to the main lists of tables and figures in the table of contents (p. iv); and (4) a bibliography that compiles references from the main document and the appendices into a single section (p. 41).

In order to maintain consistency with the language of Hawaii Revised Statutes (HRS) Chapter 343 and Hawaii Administrative Rules Chapter 200, we suggest that the DLNR be identified as the "Proposing Agency" and "Determining Agency," rather than as the "Applicant," and "Approving Agency" (p. v). Within the regulatory framework established by the statute and rules, the term "Applicant" is reserved for "any legal entity other than an agency," and the term "Approving" is more properly used to refer to an agency's exercise of its discretionary consent in matters other than the issuance of a negative declaration or the acceptance of an environmental impact statement under HRS 343.

In addition to our general comments, we have a few specific comments:

Project purpose, cost, and responsibilities

Purpose

The Draft EA states that the reservoir "is no longer needed for storage of stream water for irrigation and will be removed and restored to a natural stream" (p. 5) and "agricultural irrigation is no longer needed from this reservoir" (p. 33). It also states that "[w]ater from this reservoir is no longer needed for irrigation, so the reservoir will be removed to allow Kolea Stream to flow downstream without any obstructions" (p. 7). However, there are additional components of the irrigation system, upstream and downstream from the project site, that impair the stream's ability to flow to the sea unobstructed. The flow of Kolea Stream is obstructed/diverted at two locations mauka of the reservoir, and at one location just below the reservoir. As noted in the Draft EA, "[t]he diversion structure [below Kolea Reservoir] is owned by EMI and will remain as part of the irrigation system according to the State Water Commission's decision released on May 28, 2010" (p. 1). Unfortunately, the Draft EA fails to mention that this decision allows EMI to continue the status quo of water diversion at three locations in Kolea Stream. Therefore, it appears that although storage of stream water in the reservoir "has little current economic value . . ." (Appendix B, fifth unnumbered page), water from the regraded channel that would replace the reservoir is still needed for irrigation. To help clarify the situation, we suggest that the Final EA provide direct quotations of the pertinent language from the State Water Commission's decision, instead of merely alluding to it.

The cumulative diversion of Kolea Stream calls into question the viability of stream restoration efforts, as does the lack of information about substrate characteristics of the regraded channel and the "naturalness" of grass plantings and check dams. We suggest that the Final EA clarify how EMI plans to operate its Kolea Stream diversions and how this fits with DLNR's stream restoration plans. Would there be continuous perennial flow through all stream segments? How much streamflow would be diverted, and how much would reach the ocean via Kolea Stream, across a range of flow regimes and timescales? Without this information, it is hard to understand how "[t]he reservoir remediation will return the stream to its natural state for future generations to enjoy" (p. 33). Why is Kolea Stream a better candidate for restoration than other streams that are more amenable to native species migration?

Cost

Page 11 of the Draft EA may reveal the driving purpose of the dam removal project, to avoid future maintenance and inspection costs. This suggests that the reservoir has negative—not "little"—economic value. Therefore, we suggest that the Final EA disclose the economic valuation used to determine that "abandonment would be the best course of action" (*Id.*), including cost estimates for both dam removal and dam retention. This information would be useful statewide, as many other dams are facing similar situations.

Responsibilities

The Draft EA states that DLNR and EMI jointly proposed to decommission the reservoir (Appendix B, fifth unnumbered page). In order to provide greater transparency about the situation, we suggest that the Final EA disclose which party is responsible for (1) dam maintenance and inspection, (2) the costs of dam removal, and (3) ongoing stream restoration and long-term maintenance of the regraded/breach channels. Private industry paid for and profited from dam construction and water diversion, yet it appears that the state is removing the dam at taxpayer expense (p. 1, "[t]he DLNR will be removing the reservoir . . . "). If so, this would be a case that allowed the commodification of water for private profit for well over a century, while now socializing the cost of remediation. Such a potentially significant impact deserves to be addressed in the Final EA.

Stream restoration objectives and streamflow and sediment regimes

The U.S. Army Corps of Engineers recommended that the EA "characterize the hydrology and ecology" of streams and wetlands, and "provide a cross-section of the proposed work and the existing conditions at the proposed project location. Your EA should include Best Management Practices [BMPs] proposed to mitigate the negative impacts to any aquatic environment and a thorough discussion of project alternative that were considered" (Appendix F). Although there is some detailed information about construction-related BMPs in Appendix E, some critical baseline information is either missing altogether or could be recrafted and made accessible to readers of the main section of the EA. Mere statements that "[b]est management practices for stream restoration will be followed during the decommissioning process of Kokea Reservoir" are insufficient (p. 22). We suggest that the main section of the Final EA provide more details about these BMPs, and, more importantly, about the BMPs that will be used over the lifetime of the stream restoration effort.

What is the current storage capacity of the reservoir, and how much sediment is accumulated on the reservoir bed and banks? The rating curve presented on Existing Site Plan EG1 is a starting point for this analysis, but doesn't tell the whole story. Would the sediment all be redistributed on-site, or would some of it need to be moved off-site? What is the sediment load carried by the stream into the reservoir, and how much of this load would accumulate behind the proposed check dams? While this could prevent sediment from moving downstream during less extreme flow events, unless the check dams are maintained they could serve as a source of excessive sediment loading during more extreme flow events. The reservoir has been acting as a sediment sink, and it may not be true that "[t]he remediation project will actually reduce the loss of topsoil into the ocean . . ." (p. 36). Would the check dams present a barrier to the migration of native stream organisms?

Baseline information about stream hydrology and habitat availability is available in various reports published by the U.S. Geological Survey and the State of Hawaii Commission on

Water Resource Management. We suggest that the preparers consult these reports and their own engineering information to more completely identify, in the Final EA, pre-reservoir conditions, existing conditions, post-reservoir conditions, and stream restoration target conditions. A schematic and graphical depiction of this progression would be quite helpful. Please clarify whether or not the existing spillway will be removed, and why aligning the regraded stream to flow through the existing spillway would not be a viable alternative.

Existing planning processes

The Draft EA does not reference or address a number of planning processes under the Hawaii Water Plan (State of Hawaii Commission on Water Resource Management) and other agency and community efforts that appear to be relevant to the proposed action. At the same time, the Social and Economic Factors section (pp. 27-28) provides generic demographic information for the County of Maui, including population, ethnicity, and housing values, but no specific data for the project site. It is unclear why island-wide data is of any use in this Draft EA.

We suggest that the preparers consider the following processes and explain, in the Final EA, their relationships with the proposed action:

- State Water Resources Protection Plan
- State Water Resources Development Plan
- State Agricultural Water Use & Development Plan
- State Water Quality Plan
- State Aquatic Invasive Species Plan
- Hawaii's Implementation Plan for Polluted Runoff Control (Department of Health)
- Hawaii Coastal Nonpoint Pollution Control Program Management Plan (Office of Planning)
- Maui County Water Use & Development Plan
- East Maui Watershed Partnership Watershed Protection Program

Mauka segments of Kolea Stream, including the two diversions above Kolea Reservoir, appear to be Class 1.b. waters under the state water quality standards. Any portion of the proposed project site that lies within the Protective Subzone (*see* Pre-Consultation letter from DLNR Office of Conservation and Coastal Lands, Appendix F) also harbor Class 1.b. waters. Because the protected uses of Class 1 waters include protection of native breeding stock, we suggest that the Draft EA discuss how the proposed action would contribute to the protection and restoration of Class 1 uses above the reservoir site. With regard to cultural resource planning, page 36 of Appendix A recommends "a minimum of an Architectural Inventory Survey . . . the level of recordation to be determined in consultation with the SHPD Historic Architecture Branch." A comment letter from SHPD in Appendix F recommends that a Historic American Engineering

Report and an Architectural Inventory Survey Report be submitted for the site. Appendix B includes an Architectural Inventory Survey Report that does not bear a SHPD Doc Number, and does not include a Historic American Engineering Report. Does this Report meet the level of recordation determined in consultation with SHPD? As a matter of practice, wouldn't it be prudent to wait for SHPD to complete its reviews and approvals before publishing the Draft EA?

Instream uses and biologic and hydrographic characteristics

The Archaeological and Cultural Surveys (Appendix A) provide interesting historic information but do not make use of readily available materials concerning contemporary native Hawaiian beliefs, values, and practices in Kolea Stream. We suggest that Final EA include reference to and evaluation of the information held in (1) the statewide Registration of Water Sources and Declaration of Water Uses collected in the late twentieth century by the State of Hawaii Commission on Water Resource Management, and (2) the testimonies about East Maui instream uses submitted to the Commission in 2001 by the Native Hawaiian Legal Corporation. Information from both of these sources is summarized in the *Instream Flow Standard Assessment Report for Punalau Stream, available at* http://hawaii.gov/dlnr/cwrm/ifsar/PR200904.pdf.

An email from the U.S. Fish & Wildlife Service offered to assist the preparers in identifying appropriate survey methods and data regarding the historical or current presence of native stream species, and in conducting stream or riparian habitat surveys (Appendix F). However, the biological surveys reported in Appendix C do not provide the level of baseline information that would be expected in order to conduct a stream restoration project. We suggest that the proposing agency conduct the Hawaii Stream Bioassessment Protocol on Kolea Stream and report the results in the Final EA. This methodology establishes a baseline level of stream habitat quality and stream biotic integrity that can be reassessed over time, thus serving as an indicator of the success or failure of long-term efforts to restore native stream habitat, flora, and fauna.

Appendix C and the *Instream Flow Standard Assessment Report for Punalau Stream* present conflicting information about (1) the presence of native species in Kolea Stream, and (2) the ocean terminus of the stream channel (waterfall or not?). We suggest that these inconsistencies be rectified in the Final EA, and note that some of them may have occurred due to the dual naming of the stream. We suggest that the preparers also consult the *Report on Punalau Stream, Maui, Hawaii*, produced in 2009 by the DLNR Division of Aquatic Resources and the Bernice Pauahi Bishop Museum, *available at* http://hawaii.gov/dlnr/cwrm/currentissues/iifsmaui1/dar-6050.pdf

Thank you for the opportunity to comment on this Draft Environmental Assessment. When the Final EA is distributed, please send two printed copies to the Environmental Center.

Sincerely,

John Cusick
Environmental Review Coordinator

cc: State of Hawaii Office of Environmental Quality Control (OEQC)
Chittaranjan Ray, Interim Director, Water Resources Research Center, UH Manoa
Derrick Elfalan, Senior Projects Engineer, Oceanit Laboratories, Inc.
Davianna McGregor
David Penn

NEIL ABERCROMBIE
GOVERNOR

BRUCE A. COPPA
COMPTROLLER

RYAN T. OKAHARA
DEPUTY COMPTROLLER

STATE OF HAWAI'I
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810-0119

MAR 4 2011

PM-3038.1

Mr. John Cusick
Environmental Review Coordinator
Environmental Center
University of Hawai'i
2500 Dole Street, Krauss Annex 19
Honolulu, Hawai'i 96822

Dear Mr. Cusick:

Subject: Draft Environmental Assessment (DEA)
Kōlea Reservoir (HI00097) Removal Project, Hāna, Maui
TMK: (2) 1-1-001:050

This letter is in response to your comment letter of November 22, 2010 for the subject project. The responses follow the same ordering used in your letter.

3rd Paragraph

1. The project is paid for by the State of Hawai'i, contracted by the Department of Accounting and General Services (DAGS) on behalf of the Department of Land and Natural Resources (DLNR). The cost for removing the dam is approximately $700,000.
2. There is no long-term maintenance planned. After removal of the dam the stream channel will be allowed to revert to its natural state.
3. The objective of the project is to remove the dam and reservoir. This will be achieved by demolishing the dam appurtenant equipment and grading a breach in the dam. The stream channel currently inundated by the reservoir or covered by the dam embankment will be restored to a more natural condition.
4. The stream flow will not change significantly. The reservoir is small and during rainfall events, water is released over the spillway. After construction is completed and the vegetation is re-established it is not anticipated that the sediment regime will change significantly.

4th Paragraph

Thank you for the Punalau Stream reference. There are two (2) streams named Kōlea in the immediate area. The Kōlea tributary to Punalau is not the correct stream.

5th Paragraph

Your comments on proofreading will be incorporated throughout the document.

6th Paragraph

Brief summaries of the technical reports attached to the DEA are already included in the text. We will paginate Appendix B and add more graphics to the Final Environmental Assessment (FEA) text.

7th Paragraph

Thank you for these comments. We will consider them for the FEA.

8th Paragraph

Thank you for these comments. We will correct the inconsistencies. The proposing agency is the DAGS and the approving agency is the DLNR.

9th Paragraph

We acknowledge that there are other components to the East Maui Irrigation Company (EMI) ditch system. These components are not part of this project and are not relevant to the Environmental Assessment (EA). Please note that the two upstream diversions that you refer to are on the Kōlea-Punalau Stream, an entirely different stream. This is a dam safety project and the purpose of the project is to remove the Kōlea Reservoir. The project is not related to the on-going implementation of the interim instream flow standards (IIFS) in East Maui.

10th Paragraph

The operation of EMI's diversions is not relevant to the dam removal project. The reservoir-dam is being removed because the structure is no longer needed by the landowner (State of Hawai'i) or Lessee (EMI). The Kōlea Stream was not included in the recent Commission on Water Resource Management decision on IIFS in East Maui streams; therefore, it is not

necessary to discuss its relation with the DLNR stream restoration plans. In this case, "stream restoration" means the restoration of the channel and elimination of the artificial impoundment. There will be no measurable impact on low flow stream discharge. The intent of the project is to remove the Kōlea Reservoir-Dam. There is no intent to restore stream flow. During the process of removing the dam embankment the channel will be restored to a more natural state.

11th Paragraph

A formal economic valuation was not conducted. The reservoir-dam is being removed because the structure is no longer needed by the landowner (State of Hawai'i) or Lessee (EMI).

12th Paragraph

(1) Under their revocable permit agreement with the State of Hawai'i, East Maui Irrigation (Alexander & Baldwin) is responsible for the operation and maintenance of the reservoir. The State of Hawai'i owns the land and leases it to EMI. (2) The State will pay for the dam removal. (3) No maintenance of the stream channel will be necessary after the dam is removed. Although the lessee is responsible for the maintenance of the dam, the landowner (State of Hawai'i) also has an interest in the structures on the property. The use of public funds to remove the dam is not "socialization," but merely the State assuming responsibility for State lands. This does not represent "socializing" the cost of remediation.

13th Paragraph

We will include more discussion of best management practices in the FEA.

14th Paragraph

The maximum operating storage of Kōlea Reservoir is about 8 million gallons. The volume of sediment retained in the reservoir is not known. Inspections of the basin when the reservoir is near empty did not reveal excessive amounts of sediment. Sediment in the reservoir basin will not be disturbed. It will be stabilized with grass and will eventually be overgrown by the bamboo currently around the reservoir perimeter. The check dams will serve to retard the movement of soil as stream vegetation is reestablished. They are not intended to prevent soil from being transported downstream during extreme flow events. The check dams are not expected to be a barrier for migration of native stream organisms.

15th Paragraph

There is no available baseline flow condition data for the Kōlea Stream in the U.S. Geological Survey (USGS) records or in Commission on Water Resource Management (CWRM) records. The preparers have already consulted the available USGS and CWRM records.

The existing spillway will not be removed. It was cut into the rock on the left abutment of the dam. Aligning the stream along the spillway would be a potentially viable but more expensive alternative. Approximately 22 vertical feet of rock would have to be excavated along the spillway alignment. This would be more difficult and expensive then removing the artificial dam embankment. In addition, it is also not known if the DLNR Dam Safety Office would allow the embankment to be left in place.

16th Paragraph

We will include demographic information for the immediate area. Please note that there is nobody living in the immediate project area.

17th Paragraph

This DEA is for a dam removal project. It does not relate to the IIFS implantation in East Maui. It is not necessary to relate the project to the plans listed in this paragraph.

18th Paragraph

The project probably will not affect the protection or restoration of Class 1 water uses above the reservoir site. Removing the dam will remove one barrier on the stream, but the stream diversion downstream from the reservoir will remain in place.

The Architectural Inventory Survey Report meets the level of recordation required by the State Historic Preservation Division. A Historic American Engineering Report is not appropriate for this structure.

19th Paragraph

1) Water use registration data for the Kōlea Stream will be included in the FEA.
2) As noted earlier, the testimony and IIFS report for Punalau Stream is not relevant to the project. The Punalau-Kōlea Stream is a different stream from the project Kōlea Stream.

20th Paragraph

A more detailed biological survey is not necessary. The survey conducted is adequate for the dam removal project. No post-project monitoring is contemplated.

21st Paragraph

There is no conflicting information. As noted earlier the Punalau Stream is a different stream from the project Kōlea Stream and the information presented for Punalau is not directly comparable with the project area.

If you have any questions, please contact Mr. Mark Yamabe of my staff at (808) 586-0469.

Sincerely,

BRUCE A. COPPA
State Comptroller

Attachment
c: Oceanit Laboratories, Inc. ✓
DLNR; Russell Tsuji, Administrator