

# **FINAL—Archaeological Assessment of Existing and Proposed Waterline Corridors, Kualapu‘u to Pu‘u Nānā, Island of Moloka‘i**

**TMK: (2)5-2 (por.)**



## **Prepared For:**

Molokai Properties, Limited  
119 Merchant Street, Suite 408  
Honolulu, HI 96813

September 2011

Keala Pono 

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## **MANAGEMENT SUMMARY**

At the request of Molokai Properties, Limited, Keala Pono Archaeological Consulting, LLC conducted an archaeological assessment of approximately 27 km of existing and proposed waterline routes that traverse a portion of TMK: (2)5-2 in Kona District on the island of Moloka'i. The purpose of this work was to identify historic properties that may be located along the corridor in anticipation of new waterline construction and use of existing lines. Archival research identified two archaeological sites along the waterline routes, although a walk-through of the routes produced no evidence of archaeological remains.



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## INTRODUCTION

At the request of Molokai Properties, Limited, Keala Pono Archaeological Consulting, LLC conducted an archaeological assessment for proposed and existing waterline corridors that extend over a portion of TMK: (2)5-2 in the Kona District of Moloka'i. Molokai Properties, Limited is planning a new waterline route and will also be using an existing line. The archaeological assessment was designed to identify historic properties that may be located along the routes.

The report begins with a description of the project area and an historical overview of land use, cultural history, and archaeology in the area. The next section presents details of a site visit to the waterline corridor. Project results are summarized and recommendations are made in the final section. Hawaiian words are defined in a glossary at the end of the document.

### The Project Location and Environment

The proposed and existing waterlines are located within the Kona District of Moloka'i (Figure 1). This district includes the western half of the island and south-eastern portion. The existing waterline cuts through seven *ahupua'a* land divisions. From east to west, this includes Kaunakakai, Kalama'ula, Kahanui 2, Nā'iwa, Ho'olehua 2, Pālā'au 2, and Kaluako'i. The proposed line runs along the boundaries of Nā'iwa, Ho'olehua 2, Pālā'au 2, and Kaluako'i (see Figure 1). The terrain in this region consists of arid slopes dissected by dry, narrow gulches and small gullies that experience rare water flow. The surface is highly eroded from grazing caused by livestock and feral ungulates, periodic fires, and natural forces. The Ho'olehua-Pālā'au lands consist mainly of rich lateritic soil that runs from 10 to 30 feet in depth (Meyer 1982).

Foote et al. (1972) list three soil associations occur along the waterline route. They include:

Molokai-Lahaina Association: Deep, nearly level to moderately steep, well-drained soils that have a moderately fine textured or fine textured subsoil; on uplands.

Very Stony Land-Rock Land Association: Gently sloping to very steep, rocky and stony land types; on uplands and in gulches and valleys.

Rough Broken Land-Oli Association: Shallow to deep, very steep to precipitous soils in gulches and moderately deep to deep, gently sloping to steep, well-drained soils that have a medium-textured and moderately fine textured subsoil; on uplands.

(Foote et al. 1972:General Soil Map)

A large variety of soil types occur along the route within these associations. The major soils include Rock Land, Gullied Land, Very Stony Land, Waikapu Silty Clay Loam, Holomua Silt Loam, Molokai Silty Clay Loam, Hoolehua Silty Clay, and Very Stony Land, Eroded (Foote et al. 1972).

Ground cover classification throughout this area is predominantly non-native grasses, *koa haole*, and *kiawe* with some native *'ilima* species. Landscaped plants can be found along the roads in residential areas, and large tracts are composed of agricultural crops in cultivated fields. Drought-like conditions and the natural aridness of Molokai's south-central region keeps flora to a minimum. Rainfall along the project corridor averages 15–30 inches per year (Juvik and Juvik 1998).



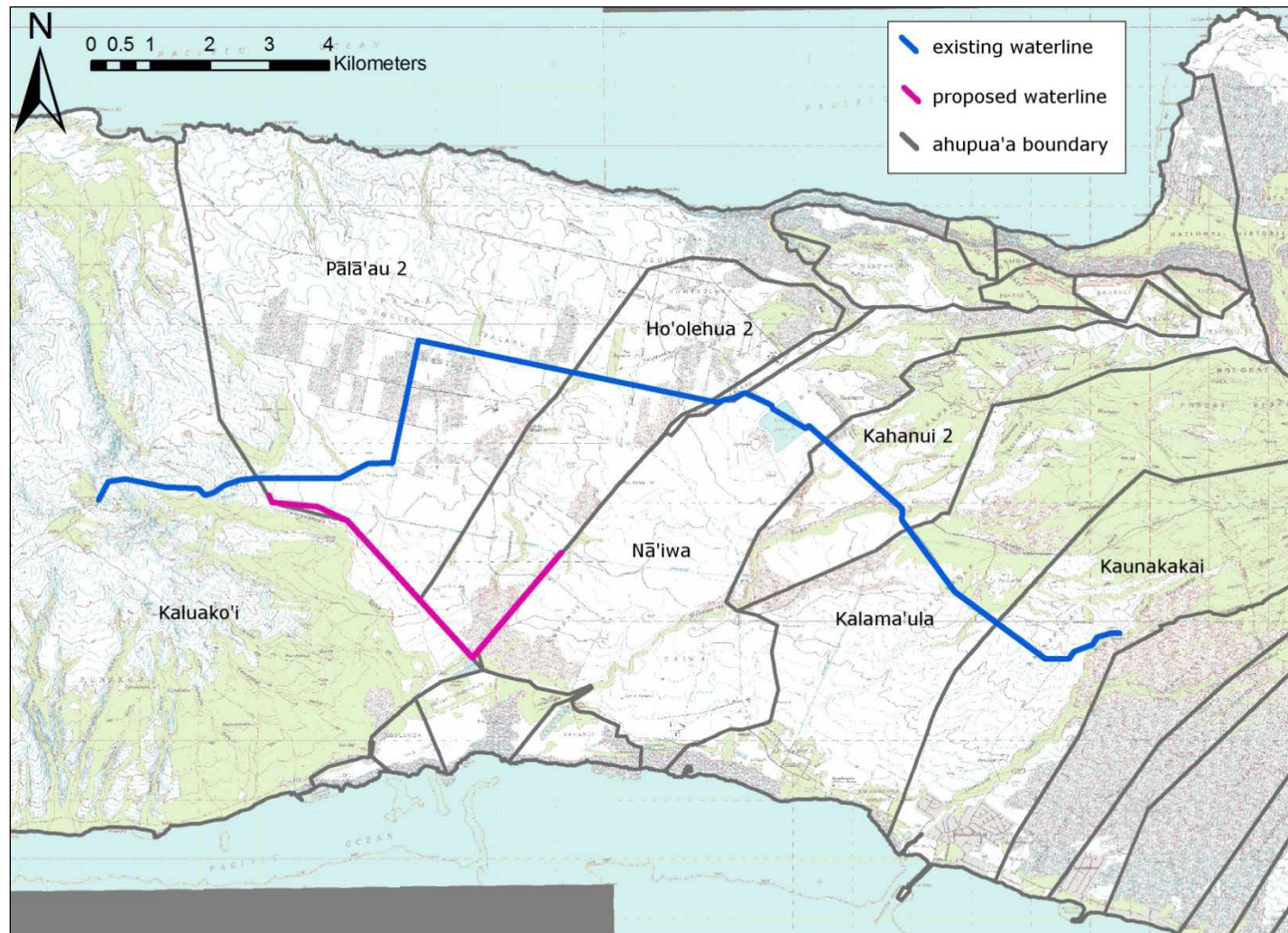


Figure 1. Location of the project area in central Moloka'i.

## BACKGROUND

This section includes information on traditional and historic land use in the vicinity of the project area, results of research on *mo'olelo*, place names, wind and rain names, *'ōlelo no'eau*, and Hawaiian language newspaper articles, as well as a summary of previous archaeology that has been conducted along the waterline route.

### Land Use

The project lands were traditionally used for the cultivation of sweet potato, with some areas planted in taro. The historic era saw widespread changes to the landscape with the introduction of cattle and deer, and the dawning of the sugar and pineapple industries. Today the lands in the vicinity of the project route are used for agriculture, ranching, housing, transportation, or lay idle.

### Traditional Land Use

In traditional times, Moloka'i had a reputation as "the land of plenty" (Handy and Handy 1991:515). Most histories of Molokai including literary and mythological sources stress the importance of sweet potato (*Ipomea batatas*) on leeward Moloka'i and in Ho'olehua and Pālā'au in particular. The notion of Moloka'i as being a "bread basket" that could supply food to large populations rests on the farming of *'uala*, taro, and the emergence of fishponds. Pālā'au on the south shore is an example where this kind of subsistence was practiced. Kaiolohia, the ancient name of these plains was known for agriculture production. Handy and Handy provide further insight on traditional land use:

Before the days of ranching, forests covered much of the uplands around Mauna Loa on western Molokai. Probably some dry taro was planted here. Dry taro is known to have been planted on the southern kula lands of eastern Molokai, from Kamalo to the eastern end of the island. On the western half of the island evidences of wet-taro cultivation were found only in the swampy lands below Manawainui Gulch, about three miles northeast of Kaunakakai. Probably there were small terraced areas upstream.

Formerly the small streams on the southeastern coast carried more water than they do now, and it is certain that in many of the interior valleys there are small sections of terraces...(Handy and Handy 1991:515)

Pālā'au and Ho'olehua were known for sweet potato cultivation, and it is likely that the lands later planted in pineapple were formerly in sweet potato (Handy and Handy 1991:517). Stone remains of sweet potato field plots line the hillsides of Mauna Loa, near Kahualewa, and there were paved trails that led from the coastal areas of western Moloka'i to the sweet potato patches in the uplands (Handy and Handy 1991:517, 519). Traditional subsistence in the vicinity of the project area can be summarized as follows:

For Pala'au ('Āpana 2), Kaluakoi, Ho'olehua, and Naiwa, planting areas for yams and sweet potatoes cannot be delimited but it is known that these were grown in that general area and were, with fish, the staples of the inhabitants. (Phelps 1941 in Handy and Handy 1991:518)

## The Project Lands in the Historic Era

A review of the area's history of land tenure reveals a minimal amount of land ownership transaction with little variation in land utilization over the past century. Since historical times, the lands under consideration can be classified as ranching and agriculture and were used primarily for these purposes. In the mid-1800s Kamehameha V used large areas on Moloka'i for cattle ranching (Cooke 1949). The first axis deer were introduced to the island in 1867. They multiplied so quickly, that by the late 1800s, hunters were brought in from the mainland U.S. to keep them from ravaging the forest. An approximated 5,000 deer a year were taken by these hunters (Whiting 1995). The deer soon moved westward, and goats and pigs became more of a problem.

In 1873 the Kalae Sugar Plantation was established by Rudolph Wilhelm Meyer. The plantation stayed in business for 12 years, when Meyer switched his interests to coffee and other crops. In 1897, a *hui* purchased 70,000 acres and leased 30,000 acres from Princess Bernice Pauahi and Charles Reed Bishop for what would later become Molokai Ranch (Cooke 1949). The following year, American Sugar Company, Ltd. (ASCO) incorporated with the *hui* and sugar production went into full swing in west and central Moloka'i. ASCO excavated wells and established more than 8 miles of irrigation ditches, but the operation suffered from crop failure because the salt content of the water was too high. ASCO turned to cattle and sheep ranching and honey farming.

A railroad system was established in the early years of cane on the island. It ran from the coast through Pālā'au and 'Īoli to the Ho'olehua plateau (Judd 1936 in Summers 1971). Remains of this endeavor could still be seen in 1931:

Fragments of this frustrated development are seen today in the graded railroad bed cutting through the gulches of Palaau...The irrigation ditches are still to be found on the Hoolehua plain, also distinct parallel furrows following the contour of the land. (Judd 1936 in Summers 1971:24)

In the 1920s the commercial pineapple industry came to Moloka'i. The California Packing Corporation began planting in lands on or near the proposed waterline in the districts of Nā'iwa, Kahanui, Kīpū, and Manowainui (Summers 1971). Soon, Libby also had pineapple interests on the island, and water was being pumped from the east end of Moloka'i to feed the fields. Large tracts of land were still used for cattle ranching at this time.

In 1922, the Kalama'ula flats were opened for homesteading. By the 1930s, problems with infiltration of salt water into the water system caused many of the Kalama'ula homesteaders to move to Pālā'au and Ho'olehua (Whiting 1995). The current Moloka'i irrigation system was first surveyed by engineer Hugh Howell in 1937 (Whiting 1995).

In 1943, in response to World War II, large expanses of Molokai Ranch lands were taken over by the military for training, and targets were established for artillery and aerial exercises. Following the war, another pineapple venture was initiated, this time by the Pacific Pineapple Company. In 1958 the Hawaii Water Authority's Molokai Water Tunnel project commenced, and water would later be stored in a 1.4 billion gallon reservoir in Kualapu'u (Whiting 1995). In 1969, the 5.5 mile tunnel system was established, bringing water from Waikolu to Kaunakakai.

Today, on the eastern corridor, traversing the Kalama'ula and Kahanui districts, Molokai Ranch, now known as Molokai Properties, Limited, continues to graze cattle. The southwestern corridor remains in a mixture of commercial agriculture, transportation use, and Department of Hawaiian Home Lands pastoral leases. In the Nā'iwa tract, Coffees of Hawai'i farms several acres of coffee adjacent to Kualapu'u village.

## Cultural History

Molokaʻi Island has a history of rich oral traditions, some of which are associated with areas bordering the proposed waterline. Summers notes the importance of the island's history:

The surviving traditional history of Molokai is fragmentary. The island itself, being the fifth largest in size of the Hawaiian group, was not of major political importance. Its importance lay in the connections its *aliʻi* made by marriage, and, in later years, the reputation of its sorcery and *kahuna*. (Summers 1971:11)

### *Moʻolelo*

Areas north of the Kualapuʻu reservoir near Puʻu ʻAnoʻano were used in ancient times to teach *kahuna* the spiritual and medicinal arts. The proverb, “Molokaʻi kuʻi lāʻau” (Molokaʻi, pounder of medicine) attests to the expertise of Molokaʻi *kahuna* in compounding medicines and poisonous potions (Pukui 1983). From a chant extolling the powers of Molokaʻi, Mrs. Vanda Hanakahi, a native of Hoʻolehua wrote in the late 20<sup>th</sup> century, “ʻAe nō ʻo Molokaʻi ka piko o ka paeʻāine o Hawaiʻi nei; he wahi laʻa ʻihi no ke anaina mea hoʻōla...” (Hanakahi) meaning that, Molokaʻi is agreed upon as the center of the Hawaiian archipelago and is a sacred and revered place of healing arts for the multitudes.

The area was part of a complex of learning centers that earned Molokaʻi its renown as being “Molokai Pule ʻOʻo” or, “Molokai of the potent prayer.” This university-like complex spanned from Nāʻiwa to Pālāʻau-Hoʻolehua, to Mahana in the west. Puʻu Nānā on the Maunaloa range, west of the proposed line is associated with Kapo and the Laʻilaʻi family and the birth of the *hula* on Molokaʻi. Traditions of sorcery and spiritual arts are rooted in Maunaloa with the god images carved from trees imbued with magic called Kālaipāhoa.

In the traditional Hawaiian epic Lonoikamakahiki, the literature speaks of Pākaʻa and Kū of Pākaʻa's sojourn in the waters and shores of Pālāʻau. The ocean waters fronting this area enjoyed frequent mention for their visits by high chiefs such as Lonoikamakahiki and his retinue. The Pālāʻau area contains Pālāʻau fishpond which is considered the largest fishpond in the entire Hawaiian archipelago. Most Hawaiian habitation in the area centered around this fishpond complex and its economy. Carlson writes of this area:

Throughout the year, in calm and in stormy weather, these fishponds furnished the chiefs with all the meat they needed and in addition there was enough to feed the fisher folk and the villagers. In the back of the fishponds in fields and on rock-walled terraces the farmers grew taro and sweet potatoes, bananas, breadfruit, sugar cane, and coconuts grew plentifully to give variety to the diet. In the hills the ti plant grew. (Carlson 1952)

The area that the proposed waterline will transect is north of the fishpond features and straddles a zone that was not highly populated due to its lack of surface water and distance from fish; the main protein source of traditional Hawaiians. Siltation caused by erosional forces impacted the complex greatly and by the 1950s the area that contained the 500-acre Pālāʻau pond was described as “covered with 4 to 8 feet of the topsoil that should have remained in place on the surrounding hills and plains. The area has been ruined and so far it is impossible to use the land for any purpose” (Carlson 1952). East of the waterline route is the town of Kaunakakai whose prehistoric settlers had access to excellent agricultural lands on the rich alluvial plain and therefore probably supported a larger population than the Pālāʻau district.

## Place Names

Place names often shed light on traditional views of an area and can provide important contextual information. The place name spellings and translations presented here come from Pukui et al. (1974) unless otherwise noted.

The island of Molokaʻi had several poetic names, including “Molokaʻi nui a Hina,” or “Great Molokaʻi, child of Hina,” and “Molokaʻi pule oʻo,” or “Molokaʻi, powerful prayer.” Hina is said to be the mother of the island, and Molokaʻi was known for sorcery and sports.

Kaluakoʻi is the westernmost *ahupuaʻa* through which the existing waterline route traverses (see Figure 1). The name translates to “the adze pit.” Maunaloa, or “long mountain,” is a mountain in Kaluakoʻi, of which one of its peaks, Puʻunānā, is the highest point in west Molokaʻi (1,381 feet). Maunaloa was known for its adze quarries and *hōlua* slides. It is also the place where the trees for making *kālai-pāhoa* images for sorcery are found. Puʻunānā translates to “observation hill,” for from here it is possible to see as far as east Molokaʻi, Maui, Lānaʻi, and even Hawaiʻi Island. Mahana is a place in Kaluakoʻi *Ahupuaʻa*, not far from the waterline route. Pukui et al. (1974) do not provide a translation for the name, but note that Molokai Ranch had a sheep-shearing shed here. In 1908 the ranch owned 17,000 sheep, but discontinued sheep farming by the 1920s. Waiahewahewa is a gulch and stream in Kaluakoʻi near the west end of the proposed waterline. The name translates to “water of Hewahewa.”

Pālāʻau 2 is the *ahupuaʻa* east of Kaluakoʻi. It is one of three land divisions of the same name on Molokaʻi. Pālāʻau translates to “wooden fence” or “enclosure.” Puʻu o Pipika is a hill in the *ahupuaʻa*, just south of the existing waterline. Pukui et al. (1974) provide no definition for the name, although the Hawaiian dictionary (Pukui and Elbert 1986) translates *pipika* as “to draw away, shrink away, to crinkle up, contract, or avoid.”

Hoʻolehua is the next *ahupuaʻa* to the east. Translating to “acting the expert,” the land division is said to have been named after an *aliʻi*. Chief Hoʻolehua was married to ʻĪloli, and their daughter was Hikauhi. These are also place names on Molokaʻi. Puʻukapeʻelua is a hill in Hoʻolehua *Ahupuaʻa*, just north of the existing waterline route. Literally “hill of the caterpillar,” a *moʻolelo* tells of a girl who was visited at night by a lover whom she later found was a caterpillar (see Site 11, or “Caterpillar Stones,” Previous Archaeology Section). When the caterpillar was burned, he burst into thousands of smaller caterpillars, infesting the hill. Kāluapeʻelua, or “baked caterpillar,” is a gulch near Puʻukapeʻelua. A version of the *moʻolelo* relates that the infestation was ended by baking the caterpillars.

Continuing east along the existing waterline route, the next *ahupuaʻa* is Nāʻiwa. This is one of three *ahupuaʻa* with that name. Nāʻiwa, or “the frigate birds,” might have been named for the birds’ beauty. Kualapuʻu is a hill in the *ahupuaʻa* adjacent to a reservoir with the same name. It translates to “hill overturned.”

Kahanui 2 is the next *ahupuaʻa* to the east. The name translates to “large place.” The existing waterline crosses Manawainui Gulch in Kahanui 2. Manawainui means “large water branch.”

The next *ahupuaʻa* to the east is Kalamaʻula, which translates to “the red torch” or “the red *lama* tree.” *Lama*, or *Diospyros sandwicensis*, is a native tree whose fruit was eaten and wood was fashioned into fish traps and sacred structures within *heiau*. *Lama* wood was also crushed and used for medicinal purposes. Puʻuluahine is just north of the existing waterline within Kalamaʻula *Ahupuaʻa*. Pukui et al. (1974) do not provide a translation but note that the hill is likely the last remaining *kahua maika* on Molokaʻi (see Site 127, Previous Archaeology Section). Kalualohe

Gulch lies just north of Pu‘uluahine. Again, Pukui et al. (1974) offer no translation. They do mention that this is an area where tunnels access ground water.

Kaunakakai is the easternmost *ahupua‘a* along the waterline route and also the name of the main town on Moloka‘i. Pukui et al. (1974) provide no name translation. Kāalahale is a hill near the east end of the waterline corridor in Kaunakakai Ahupua‘a. The name translates to “ridge house.”

### **Wind and Rain Names**

Several wind and rain names are known for the project lands (Ross 2011). These have been passed down through generations in chants and oral tradition and have become re-learned by Moloka‘i school children in protocol chants used daily at the Hawaiian immersion schools on the island. Both rain names are associated with the *‘uala*, showing the importance of that crop to the area.

Hehika‘uala is a rain name of Ho‘olehua. Literally it translates to “the rain that tramples sweet potato.” Lanikeha is another rain name of Ho‘olehua. It is a rain that shares its name with a native sweet potato variety of Moloka‘i. Puluea is a wind name for the Ho‘olehua area. It translates to “a damp breath.”

### ***‘Ōlelo No‘eau***

*‘Ōlelo no‘eau* were found for several of the *ahupua‘a* along the project corridor. These are directly quoted from Pukui (1983).

### ***Kaluako‘i***

Ke ala pūpū i Moloka‘i.

*The path of seashells of Moloka‘i.*

Among the noted things made by Kihaapi‘ilani, ruler of Maui, was a paved road lined with seashells at Kaluako‘i, Moloka‘i.

Keiki ‘ope‘ope nui o Kaluako‘i.

*The lad of Kaluako‘i with the big bundle.*

A person heavily laden with bundles. Kuapaka‘a, a boy of Kaluako‘i, made ready to go with Keawe-nui-a-‘Umi, chief of Hawai‘i, to Ka‘ula in search of Paka‘a. The lad knew all the time that Paka‘a was on Moloka‘i, for Paka‘a was his father. Before going he asked permission to bring his bundles on board. To everyone’s surprise they consisted of a large log filled with necessities, and a large rock which was later used as an anchor.

### ***Ho‘olehua***

Ku‘u manu lawelawe ō o Ho‘olehua.

*My bird of Ho‘olehua that cries out about food.*

Said of the *kioea*, whose cry sounds like “*Lawelawe ke ō! Lawelawe ke ō!*” (Take the food! Take the food!). The *kioea* is the bird that calls to the fishermen to set out to sea.

Mo‘a nupu ka lā ke kula o Ho‘olehua.

*The sun scorches the plain of Ho‘olehua.*

Refers to Ho‘olehua, Moloka‘i.

### ***Kalama‘ula***

‘Unu mai a ho‘onu‘anu‘a ke kilu o Kalama‘ula, ho‘ole‘ale‘a i ke kaha o Kaunalewa.

*Bring all the kilu for amusement at Kalama‘ula to make merry on the field of Kaunalewa.*

To come together for a gay time and bring whatever you have to add to the fun. There is a play on *lewa*, which refers to the swinging of the hips in *hula*.

### ***Kaunakakai***

Hele i Kaunakakai i Hikauhi.

*Go to Kaunakakai to seek Hikauhi.*

Go to seek that which is lost. One day, when a man of Moloka‘i was fishing, his wife felt the beginning of labor pains and went to the upland to seek help from her mother. When the husband returned, he searched everywhere in Kaunakakai for his wife. After a time she returned with their daughter, whom they named Hikauhi.

I Hikauhi, i Kaumanamana.

*At Hikauhi, at Kaumanamana.*

A man and his wife lived at Kaunakakai, Moloka‘i. While he was gone fishing one day, she felt the beginning of labor pains and went to her mother’s home in another village. When the husband arrived home and his wife was not there, he began to search for her. After he had searched fruitlessly for several days, his wife returned with their baby daughter, whom they named Hikauhi. Ever since that day, *hikauhi* has meant “in vain,” and when a person loses something and goes in search, one says, “I Hikauhi, i Kaumanamana.”

Wā ‘ōlelo i Kaunakakai

*Loud talking at Kaunakakai.*

Said of much boisterous talking. The chiefs liked to play games such as *kōnane* at Kaunakakai, and their shouts and laughter could be heard for some distance.

### **The Study Area in Hawaiian Language Newspapers**

Hawaiian language newspapers of the 19<sup>th</sup> century provide an important source of cultural and historical information of the area.

Several stories of Moloka‘i’s origins lay the foundations for the island’s mysterious and powerful past:

Na Kuluwaiea o Haumea he kane  
Na a Hinanuialana he wahine  
Loaa Molokai he akua he kahuna  
He pualena no Nuumea (Fornander 1916)

This cosmogony of Moloka'i postures that Kuluwaiea, the husband of Haumea, went after Hinanuialana who then conceived Molokai, a god and priest.

An advertisement excerpted from Ka Makaainana newspaper, from March 1897 contained the following announcement from Rudolph W. Meyer of Moloka'i (Molokai Ranch manager and trustee to Moloka'i holdings of various lands of Bernice and Charles Reed Bishop):

Olelo Hoolaha.

E ike auanei na mea a pau he mau holoholona ka lakou [lio, miula a me na iakake], e holo ana maluna o na aina hanai holoholona ma Molokai-Kaluakoi, Palaau, Ioli, Naiwa, Kahanui Kalamaula, Kaunakakai, Makakupaiaiki a me ke kula o Kawela. E hooukuia aku ana mai ka la mua kau o Iulai, 1897, no kela a me keia holoholona e hele ana maluna o ua mau aina la he 25 keneta no ka holoholona hookahi o ka mahina, e hookaaia ma ke dala, a i ole, ma ka hana maoli paha maluna o ua mau aina la, ma ka ae like a ma ke kauoha a ka Luna Hooponopono o ua mau aina la i oleloia maluna. O na holoholona i hookaa ole ia, e hopuia aku ana ma ke ano komohewa. R.W. MEYER, Luna Hooponopono, Kalae, Molokai, Maraki 25, 1897. mar. 28-4ts. (Meyer 1897:1)

The announcement concerns the problem of other people's animals (mule, horses, and donkeys) encroaching on land holdings, and clearly states the potential fines that will be levied on the owners of these animals. The land districts of Pālā'au, 'Īoli, Nā'iwa, Kahanui, and Kalama'ula are noted and support the previously mentioned use of such lands for ranching.

Prior to assuming duties as land manager for the Bishops, R.W. Meyer managed those lands for the heiress who bequeathed it to her, Princess Ruth Ke'elikōlani. The following is an announcement stating her association with R.W. Meyer:

Mai keia manawa a mahope aku nei. Ke papa ia'ku nei na kanaka a pau, mai hookuu a hoololo i ka lakou mau holoholona maluna o na aina o ke Alii ka Mea Kiekie Ruta Keelikolani e waiho ia ma ka mokupuni o Molokai, ma Kapaakea a hiki i Kaluakoi, me ka ae like ole mamua me ko'u hope R.W. Meyer. Aina e kue kekahi i keia olelo papa, alaila, e hoopii ia no ma ke kanawai SIMON K. KAAI. Agena o ke Alii R. Keelikolani. (Ka Nupepa Kuokoa 1879:3)

Her lands extended from Kapa'akea in the east to Kaluako'i on the west. Readers are dutifully warned of the consequences of their animals found on her lands.

The mystic nature of the Kalaipahoa tradition made it a popular item in Hawaiian newspapers. Stories and poetical references of Kalaipahoa are found frequently in printed resources of the 19<sup>th</sup> century and all retell of its potency and renown from Hawai'i to Kaua'i:

He moolelo no Kalaipahoa.

He akua kii laau kaulana loa o Kalaipahoa i ka wa mamua. Hookahi wale no ia laau i loa ma ka mauna o Molokai. Penei ka loa mua ana o ua laau la ma ka wahahee mai o kanaka; He moe uhane ko kekahi kanaka o Molokai, o Kaneakama ka inoa. Iloko o ka moe, hele mai kekahi laau o kuahiwi a halawai me ia kanaka, a hai mai ia ia i kona wahi e ulu ana. Kauoha mai ia ia ua laau la e lawe aku i na mohai me ka hoomana imua ona, no ka mea, he akua ia, me ka mana e make ai ke kanaka.



A pau ka mohai ana, alaila kua iho la o Kaneakama i ka laau a kalai iho la me kona pahoa i kii akua nona. No laila ka inoa Kalaipahoa. Ma kona hoao ana i ka mana o ka laau, pai pu ia i kahi mea iki o ka laau me ka ai iloko o ka umiki, a ua pau i ka make koke ka mea i ai i kela poi.

Kaulana koke ae la ua akua la ma keia pae aina a pau no ka mana e make ai. Holo aku na alii a me na kanaka i Molokai e imi ana i kekahi pauku o ia laau i mau kii akua no lakou. Ua pau no ke kumu laau me na lala, a me na aa iloko o ka lepo i ka laweia, a ua laha ka laau mai Niihau a Hawaii. Ua lilo ia i mea makemake no na lii, i mea e make malu ai na mea i lawehala ia lakou. Ke lokahi nui ka olelo, he mea make io no ka mea ai i kahi mea iki o ka laau.

Hai mai o Honolii i ka mea kakau i keia, I kona wa kamalii, haawi mai Kamehameha ia ia ka oihana kahu no Kalaipahoa. Ua owiliia ke kii iloko o ke kapa, a moe pu kela me ia i ka po. I mai kela, i kekahi manawa akoakoa ia i kekahi mea iki o ka laau me ka maiuu a ai iho me kahi miki poi, Kona hiamoe ia a loihi, aole keiki hoalaia a pau ka mana o ka laau iloko o ka opu, alaila ala mai. Nolaila, ua akaka, no ka mea make o ka laau, aole no ka mana akua, ka make ana.

I ka hoopa ana i ka aikapu, ua hoiliiliia na kii a pau o Kalaipahoa, a ua pau i ke puhiiia i ke ahi. Aole laau hookahi i koe. Aole hoi i loa kekahi laau like e ae ma Molokai, i ikeia'i ke ano o ua laau la. Ua pomaikai na kanaka no ka loa ole. (Ka Hae Hawaii 1861:1)

The Kalaipahoa of Moloka'i is associated with the project lands and its tradition of sorcery. The tradition is well storied and comprises an important part of the canon of Moloka'i's literary traditions.

The fame of the spiritually toxic wood of Kalaipahoa also made its way into the literary vernacular of everyday Hawai'i of the 19<sup>th</sup> century as evidenced by this excerpt from an 1861 newspaper:

#### NA KANAKA HAWAII!

E na kanaka maoli, e hookipa oukou ia ia, e kipulu a momona, e hooikaika ia ia, a e loa auanei ia kakou i ka mea e lawa ai ko kakou iini nui, oia hoi he nupepa nana e hoolaha ae i na manao o na kanaka Hawaii, a oia no hoi ka nupepa a ka Ahahui kanaka Hawaii i hookumu iho nei. Nolaila, e hookaakaa kakou i ko kakou maka, me ka nana pono aku i na helehelena o keia pepa hou o kakou. Ina e ike paha kakou he nupepa ino keia, e hoolaha ana i na mea ku pono ole a e hoopoino ana i keia lahui, alaila e haalele. Aka, mai haale le kakou me ka noonoo ole, o ai auanei kakou i ka laau a Kalaipahoa. (Ka Hoku o ka Pakipika 1861:1)

The last sentence of the article speaks of defeat as akin to "eating the wood of Kalaipahoa." The wood of Kalaipahoa was highly coveted by ancient chiefs for its ability to stealthily kill one's enemies. All carved wood pieces are said to have been destroyed by burning and none exist today (He Moololo no Kalaipahoa 1861).

Another history that references the position of Moloka'i as a seat of sorcery from times ancient is the story of Pahulu.

## LEGEND OF PAHULU

About the time of Liloa and Umi, perhaps long before, chiefs flocked to Molokai. That island became a center for sorcery of all kinds. Molokai sorcery had more mana (power) than any other. Sorcery was taught in dreams. All these Molokai aumakua were descendants of the goddess Pahulu.

Pahulu was a goddess who came in very old times to these islands and ruled Lanai, Molokai, and a part of Maui. That was before Pele, in the days when Kane and Kanaloa came to Hawaii. Through her that “old highway” (to Kahiki), starts from Lanai. As Ke-olo-ewa was the leading spirit on Maui who possessed people and talked through them, so Pahulu was the leading spirit on Lanai. Lani-kaula, a prophet (kaula) of Molokai, went and killed off all the akua on Lanai. Those were the Pahulu family. Some say there were about forty left who came over to Molokai. The fishpond of Ka-awa-nui was the first pond they built on Molokai. Some came to Oahu and landed on the beach opposite Mokuli‘i. The heiau of Pahulu is on the Kaneohe side of the Judd place about six hundred feet away from the old sugar mill at Hakipu‘u and out in the water toward Mokuli‘i. That is where they landed on Oahu. Near the old Judd place was a heiau for Kane-hoa-lani.

Three of the descendants of Pahulu entered trees on Molokai. These were Kane-i-kaulana-ula (Kane in the red sunset), Kane-i-ka-huila-o-ka-lani (Kane in the lightning), and Kapo. About four hundred trees sprang up in a place where no trees had been before, but only three of these trees were entered by the gods. The Lo family of Molokai, a family of chiefs and kahunas, are descended from Pahulu. Many of them are well-known persons today (Fornander 1916).

Land tenure in the area was not just large ranch owners but also included smaller land grants. The newspaper announcement below is selling a lot in Nā‘iwa, Moloka‘i.

WAIWAI PAA KUAI A  
— KA —  
LUNA HOOPONOPONO

E KUAI ANA KA MEA NONA KA INOA malalo ma ke kuai kudala, ma ke kauoha a na Luna Hooponopono o na aina o ka Mea Hanohano Levi Haalelea i make aku nei, ma ka Poakahi, oia ka la 3 o Aperila, i ka hora 12 o ke awakea, ma ka puka o ka Hale Hookoloko ma ke kulanakauhale o Honolulu. Oia hoi keia aina waiwai ma ka mokupuni o Molokai i kapaia ke Ahupuaa o NAIWA ;

He aina keia e lawa ai ka makemake no ka aina kula, a me ka aina mahi, a he aina kupono no hoi no ka poe e makemake ana e mahiai a e hanai holoholona. No na mea i koe aku, e ninau ia H. W. SEVERANCE, 173-1t Luna Kudala. (Ka Nupepa Kuokoa 1865:2)

## Previous Archaeology

The island of Moloka‘i has not received the same amount of archaeological work as the other main islands and this is reflected in the limited number of printed materials relating to Molokai’s archaeological resources. The foundation of works that comprise the canon of Moloka‘i’s archaeological resources include *Heiau of Molokai* by John Stokes in 1909; *A Regional Study of Molokai* by Phelps in 1941; and the most comprehensive work to date, *Molokai: A Site Survey* by

Catherine C. Summers in 1971. A review of the archaeological sites documented in Summers (1971) indicates two significant sites in immediate proximity to the waterline corridors and seven sites in the vicinity of the corridor (approximately 1 km away or closer) (Figure 2). The following paragraphs describe those sites.

Site 11 is located at Pu‘u Kape‘elua, roughly 400 m north of the existing waterline corridor, between Mo‘omomi Avenue and Farrington Avenue. The site consists of two components. Site 11A is known as the “Caterpillar Stones” (Summers 1971:37). Summers (1971:37) quotes a *mo‘olelo* told by Cooke (1949:102), although no description is given for the stones:

...this beautiful girl was visited each night by a lover who left before daylight. She was unable to discover who he was. This suspense told on her, and she began to waste away. A priest, consulted by her parents, advised the girl to attach a piece of white tapa to a wart on her lover’s back. In the morning, sheds of tapa helped to trace the demi-god lover to the hill Puu Peelua, in the middle of Hoolehua. The kahuna (priest) and friends of the family found a large peelua (caterpillar) asleep on the hill. The kahuna ordered the people to collect wood which was placed around the sleeping peelua, and a fire was lit. As the heat of the fire increased, the caterpillar burst into myriads of small caterpillars which were scattered all over the plain. That accounts for the army-worm pest, called peelua.

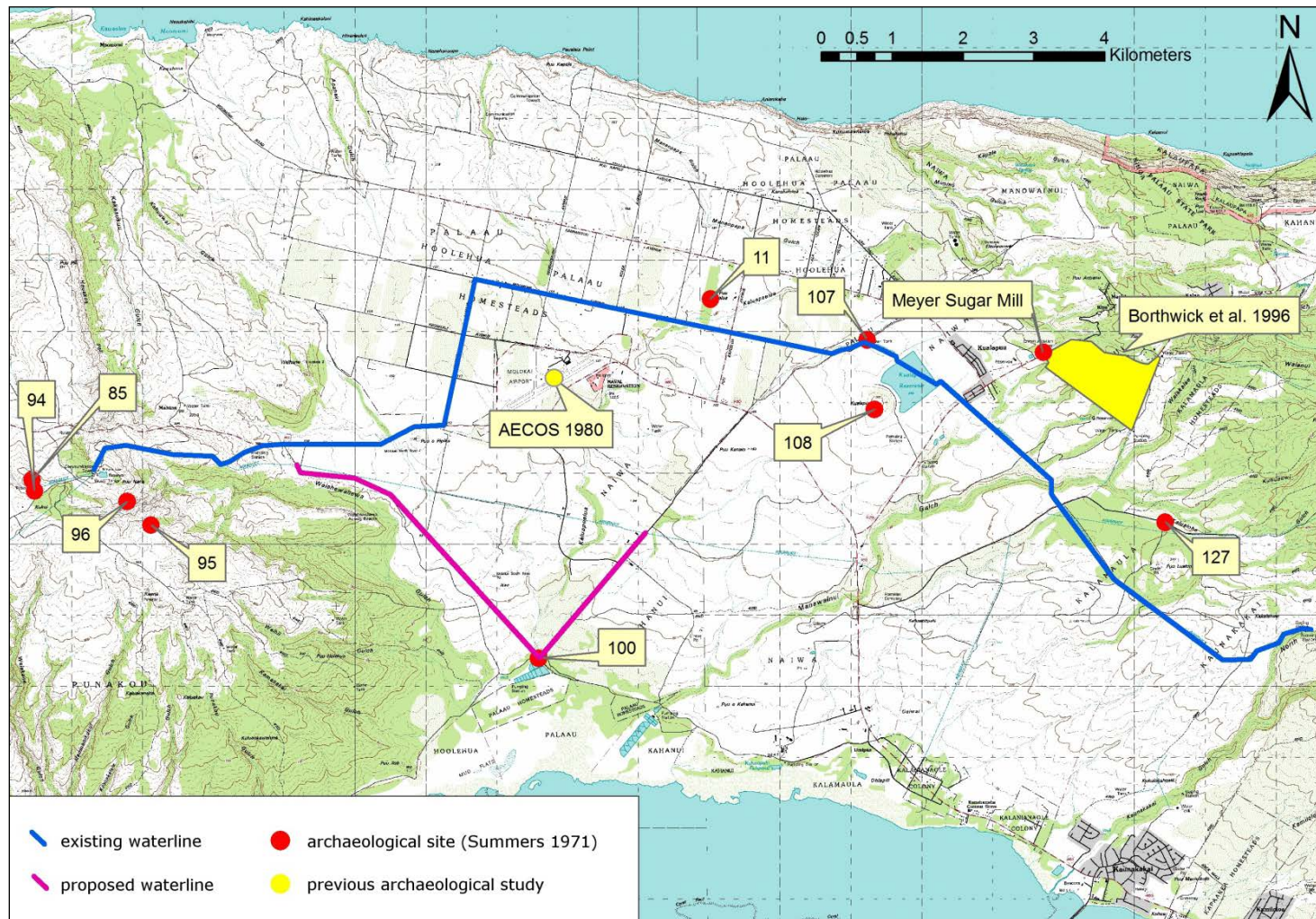
Site 11B is a “stone at Pu‘u Kape‘elua” located just south of the Caterpillar Stones (Summers 1971:37). The stone was visited in 1959 and consisted of a flat rock, measuring 7 feet long, 6 feet wide, and 22 inches tall. The flat surface contained a 21 inch-long basin with two grooves leading into two sides of the hollowed-out area on the north. On the south, another set of grooves led from this basin to another basin, 18 inches long. Marine shell was scattered around the area. The stone may have been for sharpening adzes or for collecting water (Summers 1971:37).

Site 85 consists of multiple components of an adze quarry in Maunaloa, located roughly 800 m from the west end of the project corridor. The site is described as one quarry area that begins near ‘Amikopala and covers more than 30 acres (Summers 1971:66). Platforms, upright stones, and concentrations of quarried rock and basalt flakes are among the features included in the site. Another part of the site is at the head of Mānalo Gulch, where spalls and adze blanks are found in abundance.

Site 85A is another quarry located on the western part of ‘Amikopala and also to the north. Piles of quarried stone, spalls, adze blanks, and hammerstones characterize the site.

Site 85B consists of a series of low walls on the west and northwest slopes of the ‘Amikopala bluff. Piles of quarried stone and a possible house foundation are part of the site as well.

Site 85C is a compartmentalized structure located on the west side of the ‘Amikopala bluff. The structure measures 51 feet long and 30 feet wide, and contains at least seven compartments of various shape and size. Summers (1971:68) notes that the components of Site 85 are usually obscured by grass, but were visible after a brush fire cleared the area in 1969.



**Figure 2. Archaeological sites and previous archaeological studies in the vicinity of the project corridors.**

Site 94 is Kumukahi Heiau. It is located approximately 800 m west of the west end of the existing waterline near the summit of Maunaloa. The site consists of “a piece of ground, 30 by 80 feet in extent, enclosed or outlined by stone walls varying in height from one half to 2 feet” (Stokes n.d. in Summers 1971:70).

Site 95 is a school for learning *hula* known as Ka‘ana. The site is roughly 1 km southeast of the west end of the existing waterline. The name of the site can be translated to “divide and share” (Summers 1971:70). Ka‘ana is where every kind of *hula* was learned (Coelho 1922 in Summers 1971:70). It is said that the body of Kapo rests at Ka‘ana in the form of a stone. Another rock said to be the form of Kapo is at Wailua in Hana, Maui.

In chants, Ka‘ana is noted for its *lehua* blossoms. The saying “Love slaves for the *lehua* of Kaana” originates from the great care it takes to make a *lei* from the *lehua*:

*Kauwa ke aloha in a lehua o Kaana...*a spot where travelers were wont to rest and where they not infrequently made up wreaths of the scarlet lehua bloom which there abounded. It took a large number of lehua flowers to suffice for a wreath, and to bind them securely to the fillet that made them a garland was a work demanding not only artistic skill but time and patience. (Emerson 1909 in Summers 1971:71)

The site is said to have originated when Kapo‘ulakina‘u, her brother Kahuilaokalani, and their friends were on Maunaloa and, after watching Kapo‘ulakina‘u chant incessantly during sleep, asked if they could be taught to do the same (Manu in Summers 1971:202). Kapo‘ulakina‘u replied that she could teach them if they would observe her *kapus* and do things that would help her teaching, as there are many *kapus* relating to the art. If the desire is great, however, one would be able to learn quickly. The people wanted to learn, so Kapo‘ulakina‘u enlisted her sister Na-wahine-li‘ili‘i, or Kewelani, to help her instruct and chant. Kewelani was the first person to dance *hula* on Ni‘ihau. She was also called Laea, Ulunui, and Laka.

To learn the *hula*, the students memorized a chant from Laka and then presented an offering of a pig and dark ‘awa to her. A prayer would be recited to trek to the mountains to collect greenery for building the *hula* altar. After the prayer was said, the *lehua* root could be cut. The *lehua* tree was the symbol of Kapo‘ulakina‘u and her brothers. A chant was recited before cutting the tree. Finally, when the *hula* altar was built, the plants would be placed in it, and the following was chanted:

Faintly as from a distance comes the voice of the woman,  
Of Kania‘ula, of Maheanu,  
The woman who dwells where the wind arises.  
Kapo lives in a beautiful grove  
Standing up on Ma‘ohelaia,  
As an ‘ohi‘a tree growing on Maunaloa.  
Have compassion on us, O Kaulana‘ula  
Here is a gift, an offering of the voice  
O Kapokulani, O Moe-haua-ike.  
I call to you- O answer me. (Manu in Summers 1971:202–203)

This is how Kapo became the *hula* goddess and the laws of Pi‘i-kuahu (Altar-ascending) and Moku-lehua (Cut *lehua*) began. Kapo‘ulakina‘u and Kahuilaokalani remained on Maunaloa to “establish themselves for endless time” (Manu in Summers 1971:203). It is said that the gods Kane

and Kanaloa opened springs on the island for the *‘awa* to be prepared by the *kumu hula* (Handy and Handy 1991:512). Handy and Handy provide further insight on the *hula* school:

Even before it was forested, Mauna Loa was a sweet potato rather than taro-planting area. The fact that the original and most sacred school of *hula* was there adds weight to evidence that the *hula* was part of the cult of rain making. (Handy and Handy 1991:512).

Site 96 is a *heiau* that stands roughly 600 m southeast of the west end of the existing waterline, on the cliffside of Waiahewahewa Gulch. A permanent spring once watered the gulch, but it has since dried up.

Site 100 is a boundary stone that marks the meeting point of Pālā‘au 1, Kaluako‘i, Ho‘olehua 2, and Nā‘iwa. It is also the southern point of the proposed waterline. Cooke describes the stone as follows:

In 1898 the stone stood waist high, or about 3 ft above the ground surface. When it was relocated in 1923, it was a foot under the ground, covered by silt that had washed down over it from above in the intervening 25 years. (Cooke 1949 in Summers 1971:77)

Site 107 is a *hōlua* slide on the south-southwest side of Kualapu‘u Hill. Note that the site map in Summers (1971) places the *hōlua* on the north side of the existing waterline, as is shown in Figure 2, while the site description says the *hōlua* lies on Kualapu‘u Hill. In 1966, no paving could be identified at the site, but traces of the *hōlua* slide could be seen on the hillside. It is also said that the hillside was once covered in sweet potato fields, which were delineated by rows of stones (Cooke 1949 in Summers 1971:80).

Site 108 is a *heiau* known as Kalakupale or Palakupale located on the south side of Kualapu‘u Hill, south of the existing waterline. The site is simply described as a “small heiau” (Monsarrat n.d. in Summers 1971:80).

Site 127 is a *kahua maika* located 2,000 feet north of the benchmark on Pu‘u Luahine, just north of the road. This is approximately 1 km north of the existing waterline. The site was studied in detail in 1933 (Northwood n.d. in Summers 1971:86–97). The course was described as a shallow 35 foot-wide trench that runs in a relatively straight line toward the east-southeast. Three large partially buried boulders mark the beginning of the course. The course is well marked for the first 350 yards, where it has a slight down grade. The grade increases after this initial section. A substantial amount of excavation was required to construct the beginning portion, but there is no trace of the excavated earth. Three broken and one intact *‘ulu maika* were found near the course. A possible house site also occurs in the vicinity.

A survey of the archaeological literature at the State of Hawaii Department of Land and Natural Resources Historic Preservation Division library turned up several short reports and surveys, most of which were conducted in the second half of the 20<sup>th</sup> century. None of these reports dealt specifically with archaeological features associated within the land corridor under consideration and no comprehensive historic or archaeological reports exist for the area. Two archaeological projects were carried out within the vicinity of the waterline corridor (1 km away or closer) (Table 1; see Figure 2).

**Table 1. Previous Archaeology in the Vicinity of the Project Area**

Author & Year	Work Completed	Findings
AECOS 1980	Reconnaissance	World War II sites.
Borthwick et al. 1996	Inventory Survey	Three sites: platform remnant, historic wall segment, terrace.

The first project was an archaeological reconnaissance conducted in 1980 for possible expansion of the Molokai Airport (AECOS 1980). Two alternative sites were surveyed on foot: one at the current Molokai Airport and another *mauka* of Mo‘omomi Beach. Only the current airport site is near the waterline corridor. Several historic features were found there, including World War II bunkers, earthen revetments, Quonset huts, and old roads. They were thought to date from 1942–1947.

The second project was an archaeological inventory survey completed in 1996 for the Pu‘u Kolea subdivision (Borthwick et al. 1996). A total of 350 acres were surveyed at the 850–1,300 ft. elevation in Kahanui 2 Ahupua‘a. Three archaeological sites were found, including a platform remnant (Site 1633), an historic wall segment (Site 1634), and a terrace (Site 1635). Extensive bulldozing was observed in the area, and historic ranching remains were noted, including the remnants of the 1912 Pu‘u Kolea Ranch guest house.

In addition to the above archaeological studies, an Historic American Engineering Report (HAER) was done for the Meyer Sugar Mill, located northeast of Kualapu‘u, off of Kala‘e Highway (Bluestone 1978). When the report was written in 1978, the mill was slated as “the only surviving 19<sup>th</sup> Century Hawaiian sugar mill with its original machinery intact and its original design essentially unaltered” (Bluestone 1978:1). The mill was small in size compared to those of its time (ca. 1888), but it survives as a good example of Hawai‘i’s sugar-era constructions.

A comprehensive study was conducted for the conservation of the Manawainui Watershed, an 8,886-acre expanse that begins in the 3,150 ft. Forest Reserve and outlets over the Pālā‘au table lands (Whiting et al. 1995). The natural history and land use history of the watershed were compiled for this study.



## SITE VISIT

On June 14, 2011 Keala Pono archaeologists Windy McElroy, PhD, and Manuwai Peters, MA, conducted a site visit and walk through of the waterline corridor. The team was met by Rex Kamakana of Molokai Properties, Limited, who showed the team the route of the existing and proposed waterlines. No surface archaeological resources were encountered along any part of the route.

A drive through site visit was carried out for the portions of the corridor that lie along paved or dirt roads. This includes almost the entire existing waterline route, which runs approximately 20 km, from the Pu‘u Nānā Reservoir and Treatment Plant on the west, through the Ho‘olehua Homestead and Kualapu‘u Reservoir, to the vicinity of the Kākahale Well on the east. Accessibility via four-wheel drive vehicle provided clear visibility to the area, particularly on areas in active agricultural production or along the existing waterline. The drive through ended approximately 700 m short of the Kākahale gaging station, where a locked gate restricted access to the road leading to the water tunnel and the end of the route. Certain areas of the five-mile route were traversed on foot, following the route of the proposed waterline.

The survey route presented easy accessibility as a large portion of the proposed waterline follows the Moloka‘i Irrigation System line built in 1959. In the lower southerly section of the route, rolling hillsides and small gulches marked by rocky outcroppings, grasses, and *koa haole* characterize much of the area. Although some areas were covered by non-native grasses, visibility along these sections were excellent.

The area along the existing waterline route consists of paved or dirt roads that run through residential neighborhoods, farms, and ranchland (Figure 3). The waterline veered from the road in several areas of the ranchland to traverse gulches (Figure 4). No surface archaeological remains were observed. Any traditional surface architecture that might have occurred along the roads has almost certainly been destroyed by bulldozing.

The new alternative route was driven and walked on foot. This route runs for approximately 7 km, beginning near the Mahana Pump Station, heading southeast toward the Pālā‘au Homestead, then turning northeast toward existing agricultural farms along Hua‘ai Road in the Kualapu‘u-Nā‘iwa districts. The western segment was driven, where the corridor runs along an existing fenceline with an adjacent dirt road. Areas of bulldozer push occur on either side of the road and fence, and no surface archaeological resources were observed. The eastern segment was traversed on foot. The route follows a fenceline for approximately 1,250 m, and the fence is bordered by a rough dirt road with areas of bulldozer push on either side (Figure 5). The northernmost 1,000 m do not follow the fenceline or road, but bulldozer disturbance was evident in the vicinity and no surface archaeological features were found (Figure 6).

The two previously recorded archaeological sites along the route were not found (see Previous Archaeology Section). Site 100 is a boundary stone that should have been located at the southern point of the proposed waterline route. In 1923, the stone was already partially covered by silt. It is likely that the stone is completely covered today or is obscured by the tall grass in the area. It is also possible that the stone was moved or covered over when the dirt road was bulldozed.

Site 107 is a *hōlua* slide that is plotted near the existing waterline corridor in Summers’ (1971) site map. The description of the site, however places it on the slopes of Kualapu‘u Hill, which is a much more likely spot for a *hōlua* slide. The site was not observed in either location, although Kualapu‘u Hill was not thoroughly inspected, as it does not lie directly on the waterline route.





**Figure 3. Eastern segment of existing waterline, through ranchlands south of Pu‘u Luahine. Note that the waterline parallels the dirt road. View is to the east.**



**Figure 4. Eastern segment of existing waterline, through ranchlands south of Pu‘u Luahine, where the waterline crosses a gulch. View is to the east.**





**Figure 5. Route of the proposed waterline, southeastern segment of the corridor, facing north. The waterline will follow the fenceline on the left of the rough dirt road.**



**Figure 6. End of the fenceline in the eastern segment of the proposed waterline corridor. The waterline continues northeast here. View is to the north.**

In sum, the entire route of the existing and proposed waterline showed evidence of previous disturbance, in the form of roads, grading for farmland, and bulldozer push piles. No traditional surface architecture was observed in any part of the corridor. If in the course of the proposed project human osteological remains are uncovered, the developer must contact the Hawai'i State Historic Preservation Division, in compliance with Chapter 6E of the Hawai'i Revised Statutes.

### **Summary of Findings**

Background research produced a wealth of information on the traditional and post-Contact history of the project lands. In pre-Contact times, the area was used for sweet potato farming, with some taro grown in the wetter areas. Traditional archaeological sites in the vicinity include adze quarries and associated features, at least three *heiau*, a *hōlua* slide, a *kahua maika*, a boundary marker, and storied places, such as a renowned *hula* school and the Caterpillar Stones of Pu'u Kape'elua.

Moloka'i has a rich history of oral traditions, and *mo'olelo* tell of sorcery, and medicine, and the birth of *hula*. Hawaiian language newspaper articles include colorful stories of what life was like on the island. Traditions of sorcery are recounted in the articles, as well as stories of everyday importance, such as ranch announcements and land management concerns.

Historically, ranching and sugarcane and pineapple cultivation dominated the landscape. World War II structures and the Meyer Sugar Mill are among the historic sites known to occur near the project area. Today, the project lands are still used for ranching and agriculture, and roads and residential areas occur along the route as well.

The length of the project corridor was inspected for archaeological resources and none were found. Much of the route was disturbed by modern development or previous agriculture, and evidence of bulldozer activity was noted in many areas.

## SUMMARY AND CONCLUSIONS

This archaeological assessment was conducted to identify historic properties along existing and proposed waterline routes in the Kona District of Molokaʻi, on a portion of TMK: (2)5-2, that traverses seven *ahupuaʻa*: Kaunakakai, Kalamaʻula, Kahanui 2, Nāʻiwa, Hoʻolehua 2, Pālāʻau 2, and Kaluakoʻi. This is an arid region, with much of the corridor following paved or dirt roads that run through residential neighborhoods, farms, and ranchland.

Background research revealed a wealth of information on traditional and historic land use, *moʻolelo*, place names, wind and rain names, *ʻōlelo noʻeau*, the area as represented in Hawaiian language newspapers, as well as previous archaeology conducted along the project corridor. Traditionally, sweet potato cultivation was an important subsistence activity, with some taro grown in the wetter areas. Pre-Contact archaeological sites in the vicinity of the waterline routes include adze quarries and associated features, at least three *heiau*, a *hōlua* slide, a *kahua maika*, a boundary marker, and storied places, such as a renowned *hula* school and the Caterpillar Stones of Puʻu Kapeʻelua.

A variety of *moʻolelo*, *ʻōlelo noʻeau*, place names, and wind and rain names were compiled for this study. They tell of major events such as the founding of *hula*, and the practice of sorcery, as well as every day activities, such as the importance of sweet potato cultivation on the arid landscape.

Historically, ranching and sugarcane and pineapple cultivation were major industries on Molokaʻi. Remnants of these activities extend over much of the project corridor, and ranching and agriculture are still in practice in the area today. World War II structures and the Meyer Sugar Mill are among the historic sites known to occur near the waterline route. Today, in addition to ranchlands and agricultural fields, roads and residential areas characterize much of the route.

The length of the project corridor was inspected for archaeological resources and none were found. Large tracts of land along the route were disturbed by modern development or previous agriculture, and evidence of bulldozer activity was noted in many areas. The two archaeological sites documented on the project corridor include a boundary marker and *hōlua* slide. The marker consists of a single stone that was already partially silted over in the 1920s. It is likely that the stone is completely buried today or has been moved or obscured by bulldozer activity. The *hōlua* slide was likely mislabeled on the site map presented in Summers (1971) and is located farther away from the waterline route on Kualapuʻu Hill.

In sum, a wealth of oral tradition and written history exists for the project lands. Physical evidence of the past is more difficult to identify, however, as a result of historic and modern alteration of the landscape. Two archaeological sites were documented directly on the project route, but no surface archaeological remains were observed during a site visit of the area. If ground disturbance is required for construction of the proposed waterline or alteration of the existing line, it is recommended that a formal archaeological inventory survey is conducted of the entire route. This should include a program of subsurface testing to identify stratigraphic deposits and areas that might contain buried archaeological sites or human remains.

## GLOSSARY

<b><i>ahupua‘a</i></b>	Traditional Hawaiian land division usually extending from the uplands to the sea.
<b><i>akua</i></b>	God, goddess, spirit, ghost, devil, image.
<b><i>ali‘i</i></b>	Chief, chiefess, monarch.
<b><i>‘āpana</i></b>	Piece, slice, section, part, land segment, lot, district.
<b><i>‘aumakua</i></b>	Family or personal gods. The plural form of the word is <i>‘aumākua</i> .
<b><i>‘awa</i></b>	The shrub <i>Piper methysticum</i> , or <i>kava</i> , the root of which was used as a ceremonial drink throughout the Pacific.
<b><i>heiau</i></b>	Place of worship and ritual in traditional Hawai‘i.
<b><i>hōlua</i></b>	Traditional Hawaiian sled used on grassy slopes.
<b><i>hui</i></b>	A club, association, society, company, or partnership; to join, or combine.
<b><i>‘ilima</i></b>	<i>Sida fallax</i> , the native shrub whose flowers were made into <i>lei</i> , and sap was used for medicinal purposes in traditional Hawai‘i.
<b><i>kahua</i></b>	Open place for sports, such as <i>‘ulu maika</i> .
<b><i>kahuna</i></b>	An expert in any profession, often referring to a priest, sorcerer, or magician.
<b><i>kapu</i></b>	Taboo, prohibited, forbidden.
<b><i>kiawe</i></b>	The algarroba tree, <i>Prosopis</i> sp., a legume from tropical America, first planted in 1828 in Hawai‘i.
<b><i>kioea</i></b>	The bristle-thighed curlew, or <i>Numenius tahitiensis</i> , a large brown bird with a curved beak.
<b><i>koa haole</i></b>	The small tree <i>Leucaena glauca</i> , historically-introduced to Hawai‘i.
<b><i>kula</i></b>	Plain, field, open country, pasture, land with no water rights.
<b><i>kumu hula</i></b>	<i>Hula</i> teacher.
<b><i>kōnane</i></b>	A traditional Hawaiian game played with pebbles on a wooden or stone board.
<b><i>lama</i></b>	The native tree, <i>Diospyros sandwicensis</i> , that had many uses in traditional Hawai‘i. Fruit was eaten, wood was fashioned into fish traps and sacred structures within <i>heiau</i> . <i>Lama</i> wood was also crushed and used for medicinal purposes.
<b><i>lehua</i></b>	The native tree <i>Metrosideros polymorpha</i> , the wood of which was utilized for carving images, as temple posts and palisades, for canoe spreaders and gunwales, and in musical instruments.

<i>mana</i>	Divine power.
<i>mauka</i>	Inland, upland, toward the mountain.
<i>mo‘olelo</i>	A story, myth, history, tradition, legend, or record.
<i>‘ōhi‘a</i>	Two kinds of forest trees. See also <i>o ‘ōhi‘a‘ai</i> and <i>‘ōhi‘a lehua</i> .
<i>‘ōhi‘a ‘ai</i>	The mountain apple tree, <i>Eugenia malaccensis</i> , a forest tree to 50 ft.high.
<i>‘ōhi‘a lehua</i>	The native tree <i>Metrosideros polymorpha</i> , the wood of which was utilized for carving images, as temple posts and palisades, for canoe spreaders and gunwales, and in musical instruments.
<i>pu‘u</i>	Hill, mound, peak.
<i>ti (kī)</i>	The plant <i>Cordyline terminalis</i> , whose leaves were traditionally used in house thatching, raincoats, sandals, whistles, and as a wrapping for food.
<i>‘uala</i>	The sweet potato, or <i>Ipomoea batatas</i> , a Polynesian introduction.
<i>‘ulu maika</i>	Stone used in the <i>maika</i> game, similar to bowling.

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