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PLANNING DEPARTMENT
COUNTY OF HAWAII

Transmittal Memorandum

TO : Windward Planning Commission
County of Hawaii

Hand Delivered to West Hawaii Office

FROM : Roy A. Vitousek III

DATE : April 8, 2016

RE : TMK: (3) 2-1-013: 004
Special Permit Application SPP 14-000162
Applicant: Jas. W. Glover, Ltd.

We are sending you the following:

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1	15	February 2016	Glover Hilo Quarry *Ka Pa`akai* Discussion by ASM Affiliates

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REMARKS: Please call our office with any questions. Thank you.

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EXHIBIT 54

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PLANNING DEPARTMENT
COUNTY OF HAWAII

GLOVER HILO QUARRY
Ka Pa'akai Discussion

February 2016

Teresa Gotay, M.A.
Robert B. Rechtman, Ph.D.
ASM Affiliates

Jas. W. Glover, Ltd. intends to expand their existing Glover Hilo Quarry Property to include an additional 85.34 acres within a 140 acre parcel of Kamehameha Schools Bishop Estate land (TMK: (3) 2-1-013:004) located in the *'ili* of Honohononui of Waiākea Ahupua'a, South Hilo District, Island of Hawai'i (Figure 1). Jas. W. Glover, Ltd. has been leasing portions of the parcel and carrying out quarrying operations since the early 1960s. Currently, four Special Permits for quarrying operations covering roughly 55 of the 140 acres are still active, and Jas. W. Glover plans to conduct quarrying operations (quarrying aggregate and rock for use in construction) on the remaining portions of the property that are not covered under the existing Special Permits. Jas. W. Glover must obtain approval from the County of Hawai'i Planning Commission, the Windward Planning Commission, and the State Land Use Commission (LUC) in order to secure a Special Permit for quarrying operations that will include the proposed 85.34 acre expansion.

Article XII, Section 7 of the Hawai'i Constitution obligates the State and its agencies, such as the LUC, "to protect the reasonable exercise of customarily and traditionally exercised rights of native Hawaiians to the extent feasible when granting a petition for reclassification of district boundaries." (*Ka Pa'akai O Ka'āina* v *Land Use Commission*, 94 Hawai'i 31, 7 P.3d 1068 [2000]). Under Article XII, Section 7, the State shall protect all rights, customarily and traditionally exercised for subsistence, cultural and religious purposes and possessed by *ahupua'a* tenants who are descendants of native Hawaiians who inhabited the Hawaiian Islands prior to 1778, subject to the right of the State to regulate such rights. In the context of land use permitting, these issues are commonly addressed when the LUC is asked to approve a petition for the reclassification of district boundaries, as such an action most often initiates activities that precede initial intensive development. While the approval of a Special Use Permit for quarrying operations does not involve the reclassification of any lands, Jas. W. Glover thought it prudent to provide a discussion of such rights to facilitate the Special Use Permit decision making processes for both the County Planning Commission, the Windward Planning Commission, and the LUC.

In the September 11, 2000 Hawai'i Supreme Court landmark decision (*Ka Pa'akai O Ka'āina* v *Land Use Commission*), an analytical framework for addressing the preservation and protection of customary and traditional native practices specific to Hawaiian communities was created. The court decision established a three-part process relative to evaluating such potential impacts: first, to identify whether any valued cultural, historical, or natural resources are present; and identify the extent to which any traditional and customary native Hawaiian rights are exercised; second, to identify the extent to which those resources and rights will be affected or impaired by the proposed action; and third, to specify the feasible action, if any, to be taken by the regulatory body to reasonably protect native Hawaiian rights if they are found to exist.

In an effort to identify whether any valued cultural, historical, or natural resources are present within the proposed project area, and identify the extent to which any traditional and customary native Hawaiian rights are, or have been, exercised (the first part of the analytical process); historical archival information was investigated, and prior cultural studies that included consultation and oral-historical interviews were reviewed. A summary of this analysis is presented below.

The legendary account of Ka-Miki, as translated from the Hawaiian Language newspaper *Ka Hōku o Hawai'i* by Kepā Maly, states that the district of Hilo was traditionally divided into three distinct *'okana* (sub-districts; Maly 1996). The current project area, falls within the traditional *'okana* of Hilo Hanakahi (Hilo of the chief Hanakahi), which extended from the Wailoa River to include Keaukaha and all of Waiākea Ahupua'a as well. Hilo Hanakahi was one of the larger population centers on the Island of Hawai'i. The population was sustained by the abundant marine resources of Hilo Bay, extensive spring-fed fishponds that also supported water fowl, and wetland and dryland agricultural resources. According to historical accounts published by Handy and Handy (1972) dry taro was planted wherever there was enough soil in the lava fields of Waiākea, on the slopes between the rivers. This rich land also served as one of Hawai'i Island's royal seats with chiefly residences that lasted up through the time of Princess Ruth Ke'elikōlani in the 1870s (Kelly et. al. 1981; Cordy 2000).

The rainy environs of Hilo Hanakahi were also known to many throughout the Hawaiian Islands as shown in the following translated excerpt from an 1877 Hawaiian language newspaper article:

> . . . Hilo Hanakahi is known for its torrential downpours, and this is but six of the rains of the area: 1) Kanilehua, 2) Alanilehua, 3) Hālaulani, 4) Mololani, 5) Lanipili, and 6) Lanipolua. There is no other wahi pana in the whole archipelago that is as proud of its copious rain and its charming names. Most of the rain names are related to the lehua, the chirping of birds, living conditions, and the atmosphere where the rains originate. . . There are a lot of other rains, but these are the main ones of Hilo. (in EKF 2012: 44-45)

Sometime during the A.D. 1400s, the island's *moku* (districts) were divided into distinct land units known as *ahupua'a* (Kirch 1985). *Ahupua'a* were ideally long wedge-shaped slices of land that incorporated all of the eco-zones from the mountains to the sea and several hundred yards beyond, which afforded their inhabitants unlimited access to a diverse subsistence resource base (Cordy 2000). Of the twenty plus *ahupua'a* that make up the Hilo district, only two approach this ideal including Waiākea, where the current study area is located. Waiākea, one of the largest *ahupua'a* in all the Hawaiian Islands, stretches from the eastern shores of Hilo Bay up the slopes of Mauna Kea to an elevation of 6,000 feet and is markedly broader than its neighboring *ahupua'a* to the north (Figure 2).

According to Pukui et al. (1974:220) the name Waiākea literally translates as "broad waters", which is likely a reference to the bays and freshwater streams and rivers that water this land. However, Maly mentions that *waiākea* "is also a native variety of taro, similar to the better known *lehua*" (1996:4), which may refer to the agricultural resources of the region. Maly also provides the following translation of ethnographic notes taken by Theodore Kelsey that explain how the *ahupua'a* of Waiākea was established:

> Kapapala and Waiakea were sub-chiefs who were told by their superior to run around the tracts of land bearing their names (from Tom Cook, surveyor) (BPBM SC Kelsey Box 1.5, July 2, 1921:2 in Maly 1996:6)

Kelsey also recounted that "Waiākea was so named 'because you could dig any where [sic] and find water'" (Maly 1996:6). Maly also offers the following origin for the name of the subject *ahupua'a*,

> The lands of Waiākea were named for the high chief Waiākea-nui-kumuhonua, the brother of Pi'ihonua-a-ka-lani [k] and Pana'ewa-nui-moku-lehua [w]. (Maly 1996:11)

The large land area of Waiākea was divided into several smaller land units, which included three *'ili kūpono* or independent land divisions that owed tribute directly to an *ali'i nui* (high chief) rather than to the *ali'i-'ai-ahupua'a* (chief who controlled the *ahupua'a* resources). The current project area is located in the *'ili kūpono* of Honohononui; the two other *'ili kūpono* within the *ahupua'a* of Waiākea are Makaokū and Pi'opi'o (EKF 2012). As previously mentioned, Waiākea served as a chiefly residence beginning in the 16th century. However, chiefly activity was focused far from the current project area, along the western side of the Wailoa River, within and around Pi'opi'o (Kamakau 1961; Cordy 2000).

Pukui et al. offer the following literal translation for the *'ili* name Honohononui, "much honohono grass" (1974:48). Interestingly, *honohono* or wandering Jew (*Commelina diffusa)* a creeper that grows along the edges of the inland ponds is a non-native plant, introduced during the Historic Period. However, another native plant *Haplostachys haplostachya*, an endangered scentless mint that prefers a dry environment, is also known as *honohono*. The Honohononui land unit extends inland from the Keaukaha shoreline and terminates adjacent to the eastern boundary of the Keaukaha Military Reservation, covering an area of over 400 acres, all of which are owned by Kamehameha Schools Bishop Estate. Early maps of the *'ili* of Honohononui illustrate that during the Precontact and early Historic Periods the *makai* portion of the current project area may have been covered in *hala* trees (*Pandanus tectorius*), while the *mauka* portion of the current project area included the *makai* edge of the *'ōhi'a* (*Metrosideros polymorpha*) forest labelled Pana'ewa Woods (Figure 3).

By the seventeenth century, the six *moku* of Hawai'i Island were controlled by a few powerful *ali'i 'ai moku*. There is island-wide evidence to suggest that growing conflicts between independent chiefdoms were resolved through warfare, culminating in a unified political structure at the district level. 'Umi a Līloa, a renowned *ali'i* of the Pili line who ruled from Waipi'o Valley, is often credited with uniting the island of Hawai'i under one rule (Cordy 1994). According Kamakau (1961) 'Umi's conquest began with his defeat of the Hilo chiefs and that his reign lasted until around ca. A.D. 1620, and was followed by the rule of his son, Keawenui a 'Umi, who ruled Hamākua, Puna, and Hilo from his royal residence in Hilo. 'Umi's descendants continued to rule until Alapa'inui, a descendant of the Mahi family of Kohala, conquered the island in the early 1700s (Cordy 2000).

After Kalani'ōpu'u died in 1782, his son Kīwala'ō ruled until his death, upon which the rule of Hawai'i was divided between three rulers. The sacred half-brother of Kalani'ōpu'u, Keawemauhili (Keawe), ruled over Hilo and Hāmākua and resided in Hilo; Kalani'ōpu'u's son and Keawe's nephew , Keōuakū'ahu'ula (Keōua), ruled over Ka'ū and resided there; while Keawe's nephew and Keōua's cousin, Kamehameha, ruled over Kohala and Kona (Maly 1996). Around 1790, Keōua murdered his uncle Keawe and divided the lands in Hilo District between the chiefs and warriors; then in 1791, Keōua was murdered and the Hilo lands of Waiākea, Punahoa, and Pi'opi'o became Kamehameha's personal land holdings (ibid.). Another account, recorded by Kamakau mentions Pana'ewa during the period that Kamehameha fought to bring the island of Hawai'i under his rule. Kamehameha and some of his warriors were travelling from Ka'u to meet his fleet near Hilo, "As he was descending, just out of Pana'ewa at a place called Pua'aloa, he met the war party of Ka-hekili. . ." (Kamakau 1961:125) and a brutal battle ensued, but Kamehameha survived. Another interesting account mentions Waiākea, recorded by I'i:

> . . . A skilled leader whose name I have forgotten said to Keoua Kuahuula, son of Kalaniopuu and half brother of Kiwalao, "Perhaps you should go to the chief and ask that these lands be given us. Let Waiakea and Keaau be the container from whence our food is to come and Olaa the lid."(1963:14)

Certainly the parallel drawn between Waiākea and a food container in the above excerpt is a testament to the bounty of marine and agricultural resources in the vicinity of the project area in Precontact Hawai'i. While Honohononui is located proximate to the lands in these stories, it receives no specific mention suggesting that it was peripheral to the areas and events described.

Marking the end of the Precontact Period, Hawaiians' first significant encounter with Europeans occurred in 1778 when Captain James Cook and his crew on board the ships *H.M.S. Resolution* and *Discovery* arrived in Kaua'i. With the arrival of foreigners, Hawai'i's culture and economy were drastically altered. Demographic trends during this period indicate population reduction in some areas, due to war and disease, yet increases in others, with relatively little modification of material culture. There was a continued trend toward craft and status specialization, intensification of agriculture, *ali'i* controlled aquaculture, upland residential sites, and the enhancement of traditional oral history. The Kū cult, *luakini heiau*, and the *kapu* system were at their peaks, although Western influence was already altering the cultural fabric of the Islands (Kirch 1985; Kent 1983). Foreigners very quickly introduced the concept of trade for profit, and by the time Kamehameha I had conquered O'ahu, Maui and Moloka'i, in 1795, Hawai'i saw the beginnings of a market system economy (Kent 1983). This marked the end of an era of uniquely Hawaiian culture. Some of the work of the commoners shifted from subsistence agriculture to the production of foods and goods that they could trade with early visitors. Introduced foods often grown for trade with Westerners included yams, coffee, melons, potatoes, corn, beans, figs, oranges, guava, and grapes (Wilkes 1845).

Captain George Vancouver, an early European explorer who met with Kamehameha I at Waiākea in 1794, recorded that Kamehameha was there preparing for his invasion of the neighbor islands, and that Hilo was an important center because his *Peleleu* fleet of 800 canoes were being built there (Moniz n.d.; Tolleson and Godby 2001). The people of Hilo had long prepared for Kamehameha's arrival and collected a large number of hogs and a variety of plant foods, to feed the ruler and his retinue. Kelly et al. (1981) surmised that the people of Hilo had actually prepared for a year prior to Kamehameha's visit and expanded their fields into the open lands behind Hilo to accommodate the increased number of people that would be present. It was during this early Historic Period that Waiākea Ahupua'a became part of Kamehameha I's personal land holdings (Moniz n.d.).

In 1797, Liholiho (Kamehameha II) was born in Hilo, he would grow up to play a pivotal role in Hawaiian history. In May of 1819, Kamehameha died in Kona and his young son Liholiho assumed rule over the kingdom. In concert with Kamehameha's widows Ka'ahumanu and Keōpūolani, Liholiho abolished the ancient religion and quelled a rebellion to reinstate the traditional *kapu* system in December of 1819. In October of 1819, seventeen Protestant missionaries set sail from Boston to Hawai'i and arrived in Kailua-Kona on March 30, 1820, to a country in religious turmoil. William Ellis, one of the first missionaries to arrive in Hawai'i, spent five days in Waiākea in 1823; he

described it as a well-watered place, with some of the heaviest rains and densest fog he had encountered on the island (Ellis 1963). Ellis estimated that a population of 2,000 residents inhabited nearly 400 houses scattered among the breadfruit trees and coconut palms along Hilo Bay and were fortunate to have well-stocked fishponds, fertile soil, and the proximity of timber forest (Cordy 2000).

At the end of the 1830s, industrial development was on the rise in nearby Hilo, despite the decline in whaling and the end of the sandalwood trade. In a letter written in 1840, Reverend Titus Coan remarked on the conditions in Hilo:

> Industry is increasing. Our ports and places of trade begin to put on the air of activity and life. Temporal improvements and comforts are fast increasing at Hilo, that is, near the station. Two stores of goods are opened here, and three sugar-mills have recently gone into operation near us. Sugar-cane is being planted to a considerable extent; business assumes more tone and energy, and many of the people are approximating towards industry and competence. Probably the amount of cloth worn by the people has increased ten or twenty fold during four years past. Labor is in better demand and wages are rising continually. (Kelly et al. 1981:49)

A period of great social change in Hilo began with the aforementioned arrival of the first missionaries to Waiākea in 1823 and ended in 1848 with the formal land division known as the Great *Māhele*. The introduction of new spiritual concepts combined with an increased involvement in international trade and global politics lead to a shift in settlement patterns from traditionally dispersed Hawaiian villages to more concentrated urban population centers. Then, on November 7, 1837 at 7 p.m. a *tsunami* wave hit nearby Hilo Bay. Shortly thereafter, Hilo became the site of a large scale religious revival that lasted from 1837 until 1840 and included mass conversions and meetings of up to 10,000 worshippers. Other events that had a profound effect on the demography of Hilo were the measles epidemic of 1848, which claimed one third of the population of the island, followed by an outbreak of smallpox in 1853; later outbreaks of plague and leprosy caused the population to dwindle even further (McEldowney 1979).

Historically, the entire *ahupua'a* of Waiākea, including the project area, was treated as personal land by Kamehameha I and passed on to his son Liholiho prior the Great *Māhele* in 1848. Waiākea was later inherited by chiefess Kaunuohua, a grand-daughter of Keawe who later relinquished the *ahupua'a* during the *Māhele* (Maly 1996). As a result of the *Māhele*, Waiākea Ahupua'a was set aside as Crown Lands for Kauikeaouli (Kamehameha III). In addition, only twenty-five *kuleana* were awarded throughout Waiākea Ahupua'a, the majority of which were located along Hilo Bay and *makai* of the current project area. No *kuleana* were awarded within or in close proximity to the current project area.

During the *Māhele 'Āina*, the *'ili kūpono* of Honohononui was an *ali'i* award to Kamehameha I's granddaughter, Victoria Kamāmalu (LCAw. 7713:15; Royal Patent Grant 4475 to Victoria Kamāmalu). Kamāmalu died in 1866 at the age of 27 without a written will, as a result her father Mataio Kekuanao'a inherited her landholdings, which eventually passed to her half-sister Ruth Ke'elikōlani who, in turn, willed them to Bernice Pauahi Bishop. It was in this way that the *'ili kūpono* of Honohononui became part of the lands of the Bishop Estate and Kamehameha Schools.

In the decades following the *Māhele* of 1848, much of the *mauka* lands in Waiākea were leased for ranching and sugar interests. Sugarcane cultivation had a profound impact on Waiākea Ahupua'a. The declining population of Waiākea began to increase as a result of the industrial and economic growth brought about by the sugar industry (Wolforth 2007). By 1857, there were three sugar mills producing sugar for export in the Hilo area. With the Kingdom-wide economic depression that occurred as a result of the U.S. whaling fleet pulling out of the Hawaiian Islands in 1859, the focus of commercial cultivation shifted from general agriculture to sugarcane (McEldowney 1979). The 1860s saw an increase in the appropriation of land by foreigners for commercial sugar cultivation. By 1874, "Hilo ranked as the second largest city in the islands, as a result of its central position in the rapidly expanding and intensified sugar industry at Waiākea" (McEldowney 1979:39).

An article written by a resident of Keaukaha, W.K. Laweliilii Jr., published in the May 29, 1880 edition of the Hawaiian language newspaper *Ko Hawaii Pae* (later translated by Mary Kawena Pukui) describes the lands of Honohonui in the late 1880s thusly:

> Of Honohononui – This is a good land, it has plenty fish, and is a pleasant place to dwell, but it has no people. This land is at the north-west of Lokowaka. Just outside of this land is the pahoehoe (lava) semblance of seaweed (limu kohu) of a sweetheart embrace, amid the lipoa fragrance of mokihana, and just beyond it is the surf, ¼ mile from the shore. Anciently this was a celebrated land for the number of people, some 4,000, and this is the story of this land at that time: When the people of this place ate till satisfied, then covered the calabashes alike in all the houses, and at once the rattling was heard above Kaumana, over nine miles distant; and so also of Kaumana the closing of their calabashes was heard below (HEN Thrum #107 n.d.:2-3).

Laweliilii's description of Honohononui suggests that the *'ili kūpono* once supported a substantial population, which by the late 1800s had largely abandoned the area. However, by 1901 nearby Hilo was the epicenter of sugar production and export on the island of Hawai'i. By 1918 the land cultivated for sugar reached 7,000 acres and fell under new homesteading laws that required the government to lease portions of it to individual homesteaders who would grow sugarcane in exchange (Kelly et al. 1981). These house lots, homesteads, and cane lots centered along present day Kīlauea Avenue and extended to the southwest of the current project area to the west of the Wailoa River, *mauka* of Hilo Town. Contractual and legal problems combined with the declining sugar market and the devastating *tsunami* of 1946 led the Waiākea Mill Company to cease operations in 1947.

The majority of the eastern portions of Waiākea, including Honohononui remained outside the region of sugar cultivation, most likely due to the shallow soils therein. However, portions of Honohononui located between the coast and Lyman field were used as pasture lands in the early 1900s; despite the underlying *pāhoehoe*, bunch grass grew enough for grazing. A 1919 Land Court survey map (No. 433) shows the extent of the lands of Honohononui, 470 acres, at that time (Figure 4). Historic accounts, such as the following excerpt from a 1922 Hawaiian newspaper (*Ka Nupepa Ku'oko'a*), tell of the ingenuity possessed by native Hawaiian farmers who planted the lava flows in the project area vicinity:

> . . . Another way of doing this was to rot weeds where the soil was good and then carry them to fill the hollows made on the *pahoehoe* and then plant whatever plants he chose. O my reader, the proofs of these are on Hawaii. There are the *pahoehoe* lava beds walled in by the ancestors, in which sweet potatoes and sugar cane were planted and they are still growing today. Not only one or two but several times forty (*mau ka'au*) of them. The house sites are still there, not one or two but several times four hundred in the woods of Pana'ewa. (Handy and Handy 1972:131-132)

In 1914, the Territory of Hawai'i set aside roughly 213 acres of government land in eastern Waiākea known as the Keaukaha Military Reserve (KMR), located to the north of the current project area, to be used by the National Guard of Hawai'i as a rifle range (Escott 2013b). In 1925, the Territory withdrew 33 acres from the rifle range lands combined with an additional 100 acres of land in Keaukaha for use as an airfield. The construction and gradual expansion of General Lyman Field (Hilo International Airport) has had a significant impact on Honohononui. The *'ili* is now bisected by an extension of the airport's main runway, and Kekuanaoa Place, which extends along the southern edge of the airport property marks the northern boundary of the current project area (see Figure 1). Over time, particularly during the two world wars, KMR was expanded to cover over 500 acres, including an extensive stretch of land south and east of Honohononui. Currently, KMR has an armory, offices, barracks, support facilities, firing ranges and training areas and acts as the headquarters for two infantry battalions of the Hawaii National Guard and two Aviation Detachments of the Army Air Guard (ibid.). The lands of KMR have been the subject of the limited archaeological investigations in the vicinity of the current project area, the results of which will be summarized below.

Around 1921, the Bishop Estate began subdividing the coastal portion of Honohononui into residential lots through Land Court Action (LCA) No. 433. This LCA would have several iterations over the decades to come. By 1964, the current project area was identified as Lot 47-D-3-B (LCA 433 Map 13); and by 1999, as Lot 47-D-3-B-2 (LCA 433 Map 17), which can be seen in a 2014 survey map for the current proposed quarry expansion (Figure 5).

Soon thereafter the coastal area to the west of Honohononui was divided into residential lots for the native Hawaiians, which became the thriving Keaukaha Hawaiian Homes community. According to lifelong Keaukaha resident Rhea Akoi, the families of Keaukaha buried their loved ones within a system of inland lava tubes located where the Hilo Airport is now (Akoi 1989). It is likely that the majority of these lava tube burials were destroyed or sealed during the construction of the airport.

In 1955, Robert Yamada leased roughly 380 acres of Honohononui *mauka* of Kalaniana'ole Avenue, which extended south of the Hilo airport, for pasture land. In 1961, most of this land was chain dragged. Between 1965 and 1970, Yamada used the land as a place to stockpile sugar cane bagasse. In 1975, Yamada and sons reduced their lease to roughly 180 acres, which included nearly 150 acres for agriculture and about 30 acres for a quarry site. In that year most the leased lands were cleared using bulldozers and turned to pasture. In 1986, roughly 160 acres located *mauka* of Kalaniana'ole Avenue and north of the airport was leased by Frank Deluz for pasture.

Since the 1980s, several studies have been conducted that contain archaeological, cultural, and oral-historical information relevant to Waiākea Ahupua'a with a primary focus on the Hilo town area (Wolforth 2006 provides a detailed list of these studies). The earliest archaeological study conducted in the vicinity of the current project area was done in 1988. Paul H., Rosendahl Ph.D. Inc. (PHRI), conducted an archaeological reconnaissance survey (Rosendahl 1988) of a square 23-acre parcel and sewer line corridor for the then proposed Hilo Wastewater Treatment

Facility, located to the northwest of the current project area and southeast of Lyman field. No historic properties or cultural resources were encountered during that study.

As previously mentioned, several archaeological studies have been conducted within the lands of the KMR. Beginning in 1996, Cultural Surveys Hawai'i (CSH) conducted a selective archaeological reconnaissance survey (Devereux et al. 1997) of a 500-acre parcel within KMR. Portions of their survey area bordered the current project area to the west, south, and east. As a result of their study, two archaeological sites were identified; however, one of these was subsequently reinterpreted to be a modern bulldozer push pile. The other, temporary site CSH-1, is a C-shape enclosure located near a Jeep road interpreted to have been a temporary shelter. Devereux et al. suggested that the Jeep road may be a remnant of the old Puna Trail (SIHP Site 18869), and that the C-shelter may have been associated with this historic trail. In addition to the C-shape, Devereux et al. also recorded ten historic buildings associated with KMR. No further work was the recommended treatment for the historic buildings. However, they also recommended that a more intensive archaeological inventory survey be conducted within the undisturbed forested areas along what they believed to be the old Puna Trail alignment, located to the south of the current project area.

In 2000, CSH conducted a subsequent archaeological inventory survey (Hammatt and Bush 2000) of selected portions of KMR near the Puna Trail alignment. As a result of their revisit, they fully documented the previously identified C-shape as SIHP Site 21657 and interpreted it as military in origin. In addition, they identified two new sites: SIHP Site 21658 comprised of five *ahu* (rock mounds) interpreted as a location marker for a water source or temporary shelter; and SIHP Site 21659, a modified lava blister interpreted as a traditional Hawaiian agricultural feature. Hammatt and Bush also recorded a section of the previously recorded Puna Trail (SIHP Site 18869).

In 2001, Wendy L. Tolleson conducted limited data recovery (two test units) of SIHP Site 21771, located to the west of the current project area within KMR (Tolleson and Godby 2001). Site 21771 consists of four features (a platform, an enclosure, a possible *imu*, and a meadow) and was interpreted as dating to the late 1800s and associated with the construction and maintenance of the Puna Trail. Tolleson opines that the Puna Trail was widened from a foot trail to a Government Road during this time in order to accommodate horses and wagons.

In 2002, Scientific Consulting Services conducted an additional archaeological inventory survey (Escott and Tolleson 2002) of KMR. As a result of their study, four sites previously identified by Hammatt and Bush (2000) were recorded (SIHP Sites 18869 and 21657-21659). Also in 2002, PHRI conducted a 23-acre archaeological reconnaissance survey (Rosendahl 2002) located immediately west of the current project area and to the southeast of Lyman field. No historic properties or cultural resources were encountered as a result of that study.

In 2013, CSH conducted an archaeological inventory survey and prepared a monitoring plan (Wheeler et al. 2014) for KMR (TMKs: (3) 2-1-012:003, 131 and 2-1-013:010). As a result of their study, they identified eleven historic properties, five of which (SIHP Sites 18869, 21657, 21658, 21771, and 23273) were previously identified and six (SIHP Sites 30008-30012 and 30038), which were previously unrecorded. Wheeler et al. deemed all of the sites encountered as eligible for the National and Hawai'i Registers of Historic Places, with the exception of the portion of the old Puna Trail (Site 18869), whose lack of integrity as a result of modern impact rendered it no longer significant. The newly identified sites included the following: a lava tube shelter (Site 30008), a modified outcrop shelter (Site 30009) a five-feature complex associated with the Puna trail (Site 30010), a two-feature complex of unknown function (Site 30011), and two trails (Sites 30012 and 30038). The trail segment designated Site 30038 was interpreted as an intact remnant of the Puna Trail alignment and was assigned a separate site number because it diverts from the modern Jeep road alignment that had been assigned the earlier Puna Trail designation (Site 18869). No further work was recommended for seven of the eleven sites; while three of the sites were recommended for preservation through avoidance (Sites 21658, 21771, and 30038) and the remaining site (Site 30010) was recommended for subsurface testing.

Two previous archaeological surveys and one ethnohistorical study have been conducted within the *'ili* of Honohononui itself. The two prior archaeological surveys (Escott 2013a and 2013b) covered the entirety of the current project area between them. The findings of each study are presented in detail below.

In 2012, the Edith Kanaka'ole Foundation (EKF) prepared a comprehensive ethnohistorical study of Honohonohui for Kamehameha Schools Land Assets Division. This study included several oral history interviews with Keaukaha residents and others with strong familial ties to the Honohononui area. The cultural information shared pertained mostly to the coastal portions of the *'ili*, primarily because that is where the population was and is concentrated; however, their discussion of culturally significant places referenced the entire land unit. With respect to the more *mauka* areas of the *'ili kūpono*, one informant, Leilani Aina Cleveland, did recall the following memory from her childhood, ". . . at the back of the house – about three miles more or less, there was a big forest with lots of Mountain Apples and Rose Apple trees and we used to go there and pick up the fruits – tasted so good" (Cleveland

2006 in EKF 2012: 91). While substantial cultural information was shared by the interviewees about the general area of Honohononui, no specific cultural places or practices were identified to exist or have taken place within the current project area or its immediate vicinity. As a part of their study, EKF offered a native perspective (with reference and structural tie to the *kumulipo*) with respect to potential land use practices within Honohononui that they suggest effect the groundwater (Moanaliha) water recharge cycle, which is a vital element to a healthy and productive environment, both physical and cultural. Specifically, they modeled that if native forest was restored within Honohononui, the annual recharge rate would increase and thus restore the viability of coastal ponds and off-shore reefs and associated fauna. As they relate:

> The analysis of recharge indicated a higher influx of wai to the Moanaliha with a restoration that focuses on the establishment of native species. . . The general goal is to encourage native plant species, and a general decrease in areas having higher temperatures/evaporation and species that are high users of water through transpiration. In general, restoration options should be focused on the preservation of existing native forest or plant species–especially to limit the spread of non-native vines and other plants that change fundamental structures. Within the existing 'ōhi'a forests patches, encourage outgrowth into neighboring non-native forest stands. This is particularly prevalent in the southern half of the 'ili kūpono near the gravel mines. Other opportunities exist within the open shrub/grassland communities to convert back to native forests . . .

In June of 2012, Scientific Consulting Services, Inc. (SCS) conducted archaeological fieldwork (Escott 2013a) in the southernmost fifty acres of the current project area (TMK: (3) 2-1-013:004 por.) for a then proposed 10.05- acre expansion of the extant quarry. As a result of the pedestrian survey no archaeological sites or features were observed within their study area. In addition, very little natural landscape was present in the project area as a result of past and ongoing quarrying activity. Escott summarized his field observations thusly,

> Three quarters of the 50-acre parcel has been quarried in the past. Only the northeast corner of the project area is unaltered forest. The entire 50.0 acres were surveyed during the current study. At present, there are no cultural resources or modern structures on the study parcel.

In July of 2013, SCS conducted archaeological fieldwork in the northernmost portion of the current project area (TMK: (3) 2-1-013:004 por.) for the proposed expansion of the existing quarry (Escott 2013b). As a result of the roughly ninety-acre pedestrian survey, no archaeological sites or features were identified within the current project area. Escott summarized the terrain of the project area thusly:

> Roughly one quarter of the project area is previously quarried ground surface. The remainder of the project area has north-south bulldozer cuts through it, or has been completely bulldozed in the past. (2013b:6)

Escott also included the following conclusion based on his review of previous archaeological studies within the vicinity of the current project area, all of which report a low site density:

> The studies suggest that the lack of sites in this region is the result of the rugged and inhospitable landscape, having little fertile soil or arable land, being thickly forested, and subject to high rates of rainfall. (Escott 2013b:21)

Escott (2013b) goes on to suggest that although no cultural resources were identified within the project area, undiscovered archaeological features may exist within the limited previously undisturbed areas of thick vegetation. As a result he recommended that a qualified archaeological monitor be present during initial ground clearing and grubbing operations for the proposed expansion.

In August of 2015, Glenn G. Escott prepared a report that consisted of descriptions of four of the aforementioned previously recorded sites (SIHP Sites 21658, 30008, 30009, and 30038) located in closest proximity to the current study area, within the adjacent KMR property. According to Escott, "The sites are located between 100 and 300 meters southeast of the existing Glover quarry boundary and between 300 and 600 meters southeast of the proposed quarry expansion project area boundary" (2015:1).

The current project area comprises the *mauka* portion of the *'ili* of Honohononui, including the lands west of the Keaukaha Military Reservation and south of Lyman Field. The land of Honohononui has been subjected to intensive ground disturbing activities associated with use as cattle pasture, particularly *makai* of the airport while the current project area has been subject to quarrying activities for over fifty years. Evidence of quarrying and other land disturbing activities are clearly illustrated in aerial photographs (Figure 6). At present, the land located adjacent to the current project area are zoned as agricultural and/or light industrial and consist of a landfill and transfer station, a skeet

range, vacant State-owned lands, and existing quarries. Ground cover within the current project area is dominated by bare land with some areas of forest and scrubland vegetation.

A review of historic maps reveals the existence of what many refer to as the Old Puna Trail located near the southern boundary of the current project area. The 1901 tracing of an 1851 Hawai'i Register Map reproduced in Figure 3 shows a small segment of a "Road to Puna" clearly marked outside of the southern boundary of Honohononui. While Map 001 of the 1919 Land Court Application 433 reproduced in Figure 4 shows a road alignment clearly marked as "Old Puna Road" along the outer edge of the southern boundary of Honohononui. However, neither depiction shows the extent of the Road to Puna or Old Puna Road beyond the current project area in either direction. What appears to be the same alignment can be seen in a 1932 USGS topographic map marked as "Puna Trail" (Figure 7), which extends northwest to the Hilo Airport and southeast into Puna District. This same alignment is depicted as an unnamed trail in 1954 and 1959 USGS maps (Figure 8), which leads south to Kea'au and continues along the coast until just south of Māku'u where it becomes a graded road at Waiakahiula but also splits towards Pāhoa Junction. The same unnamed trail also appears on a 1961 map; however, by 1963 an unnamed unimproved dirt road, which terminates at a point roughly 350 beyond the current project area (Figure 9), has taken the place of the unnamed trail alignment. By 1981, the unimproved dirt road has become a light-duty road (Figure 10), which occupies the same alignment as in the 1963 map (see Figure 9).

The various iterations of the Road to Puna/Puna Trail alignment as seen in the Historic maps reproduced in the current discussion suggest a Historic origin for the trail with subsequent modifications over the passing decades. It appears that portions of the Puna Trail fell into disuse, with the exception of the northernmost portion, which largely falls within the KMR in close proximity to the current project area. As previously mentioned, in 1914 the National Guard began using the nearby KMR as a rifle range and by 1925, a portion of the KMR was developed into an airfield. The National Guard appears to have used the former Puna Trail alignment as an access road, which facilitated access across the entire KMR property. Today the road through KMR, which extends to the south just outside of the current project area still bears the name "Puna Trail".

Upon collective review of the prior cultural, archaeological, and historical studies, it appears that transportation-related sites such as trails and temporary shelters along with resource collection and burial areas are the archaeological features and traditional cultural places most commonly identified the general project area vicinity. Such sites and places are highly valued and culturally significant and can contribute to our understanding of Hawaiian resource procurement, travel, settlement patterns, and social organization. While a possible remnant of the historic Puna Trail appears to lie just outside of the current project area, archaeological investigations (Escott 2013a, 2013b) found no evidence of trails or any other archaeological features or burial areas within the current project area. Likewise, the extensive cultural/oral historical study of Honohononui conducted by the Edith Kanaka'ole Foundation (EKF 2012) did not identify any specific valued natural or cultural resources with the current project area. The EKF study did point out the importance of maintaining a balanced environment from a cultural perspective, with respect to "natural" environmental zones and the water recharge cycle, specifically, maintaining a proper proportion of native forest to attract and trap precipitation. However, by design their study was focused on a single land unit within a larger landscape, and it is within this larger landscape of Waiākea Ahupua'a, Hilo Hanakahi, and the South Hilo District that the consideration of environmental balance should be considered.

Given the culture-historical background presented above combined with the results of prior archaeological and cultural/oral-historical studies conducted specific to Honohononui as well as within the greater Waiākea/Hilo Hanakahi area, it is the finding of the current analysis that there are no specific valued cultural, historical, or natural resources present; nor are there any traditional and customary native Hawaiian rights being exercised within the current project area. The more than fifty year history of intensive land use within and adjacent to the current project area also supports this conclusion.

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Figure 1. 2013 Satellite image showing location of the current project area outlined in red within the *'ili kūpono* of Honohonui shaded yellow.

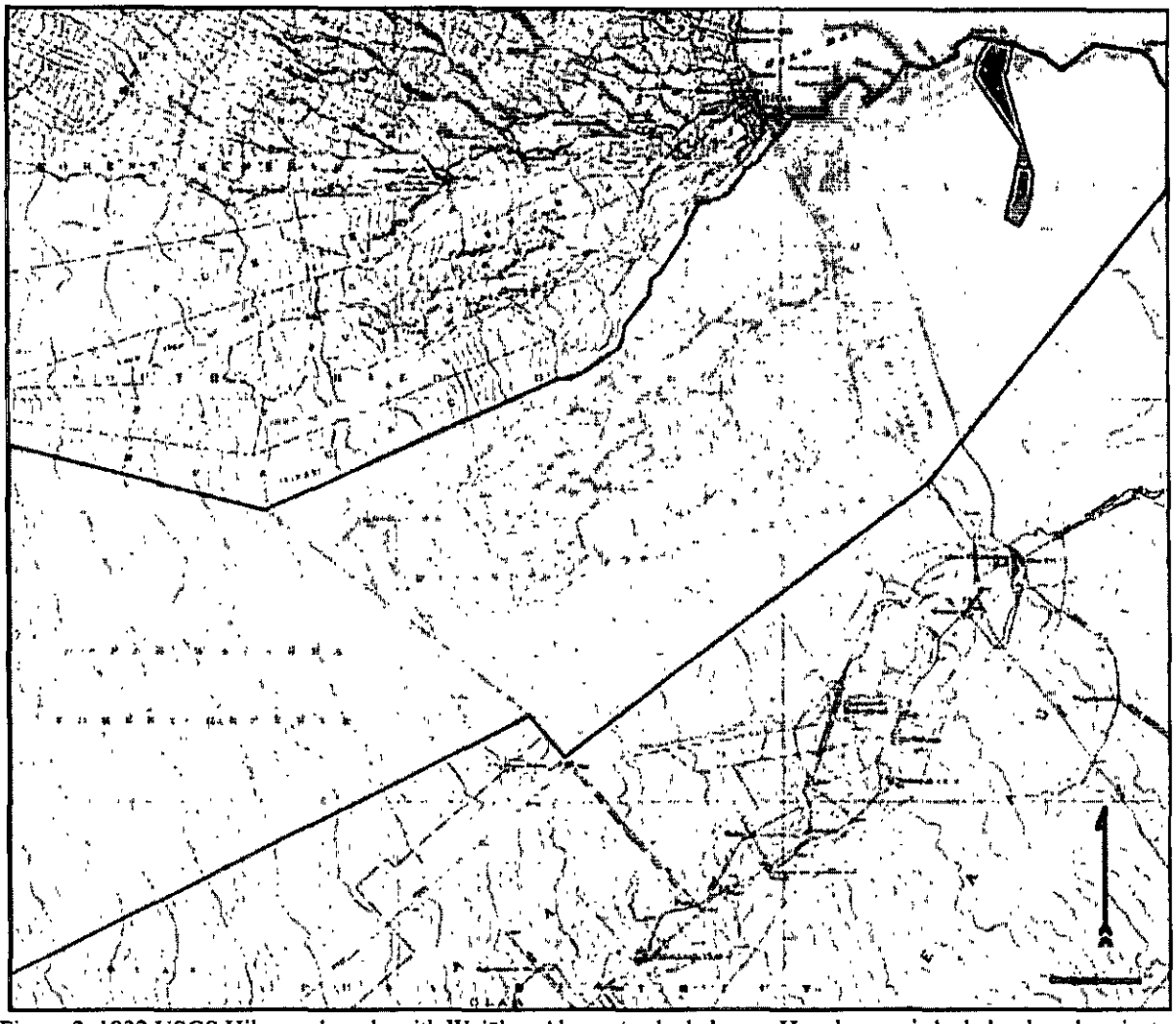

Figure 2. 1932 USGS Hilo quadrangle with Waiākea Ahupua'a shaded grey, Honohononui shaded red, and project area outlined in green.

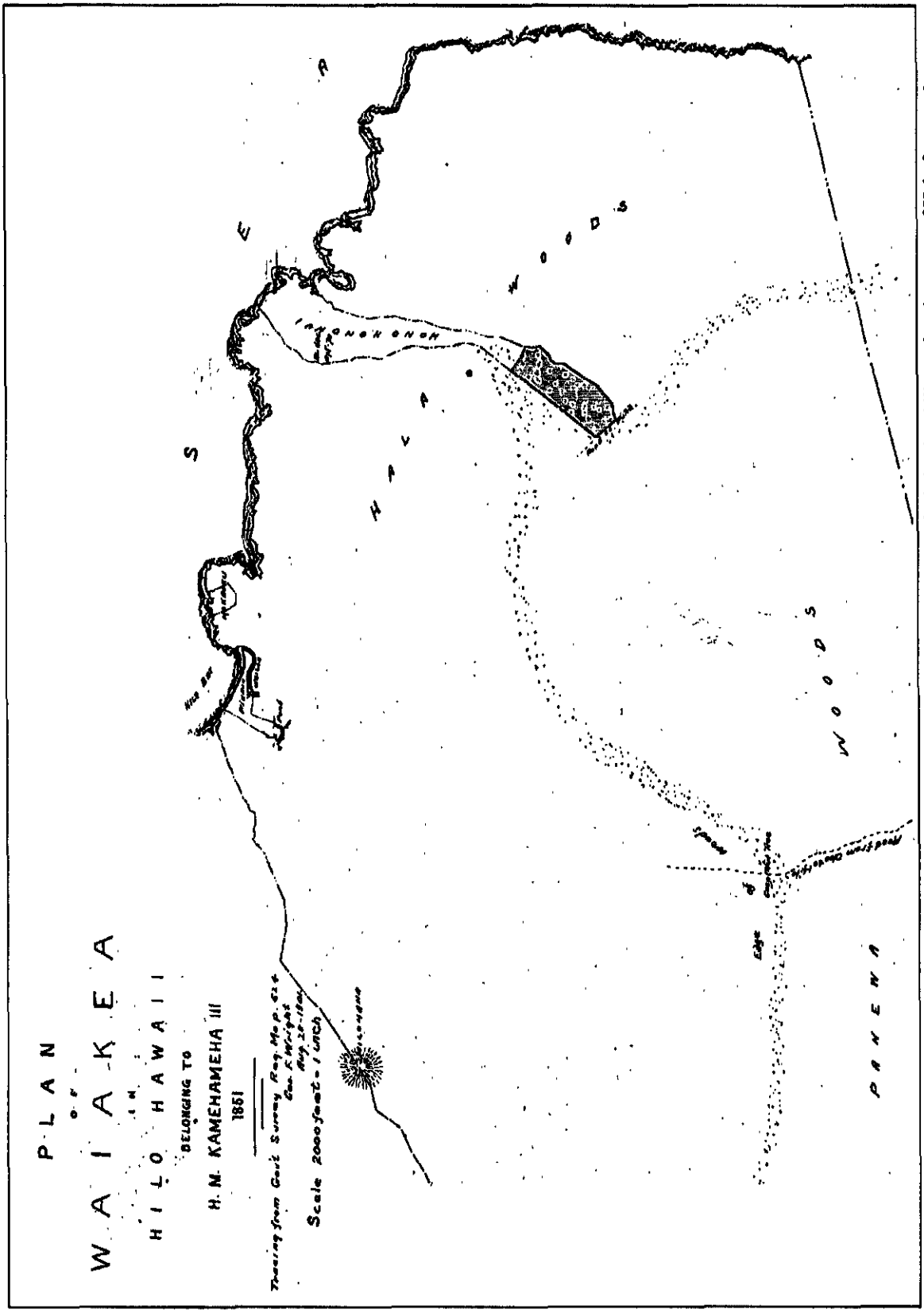

Figure 3 1901 tracing of 1851 Hawai'i Registern Map No. 524 showing the current project area shaded red and illustrating the extent of Hala forest and Pana'ewa forest in Honohononui and the Puna trail just south of the project area..

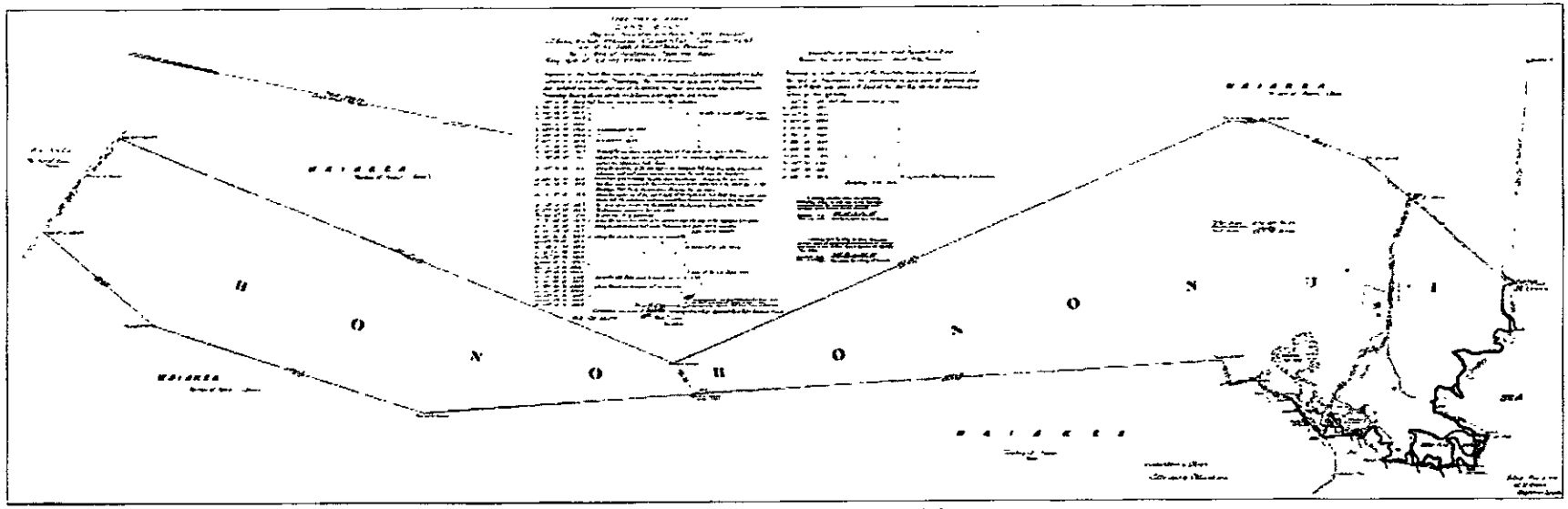

Figure 4 Land Court Application Map for Petition No 433 showing LCAw. 7713:15 (the *'ili kūpono* of Honohononui) ca 1919

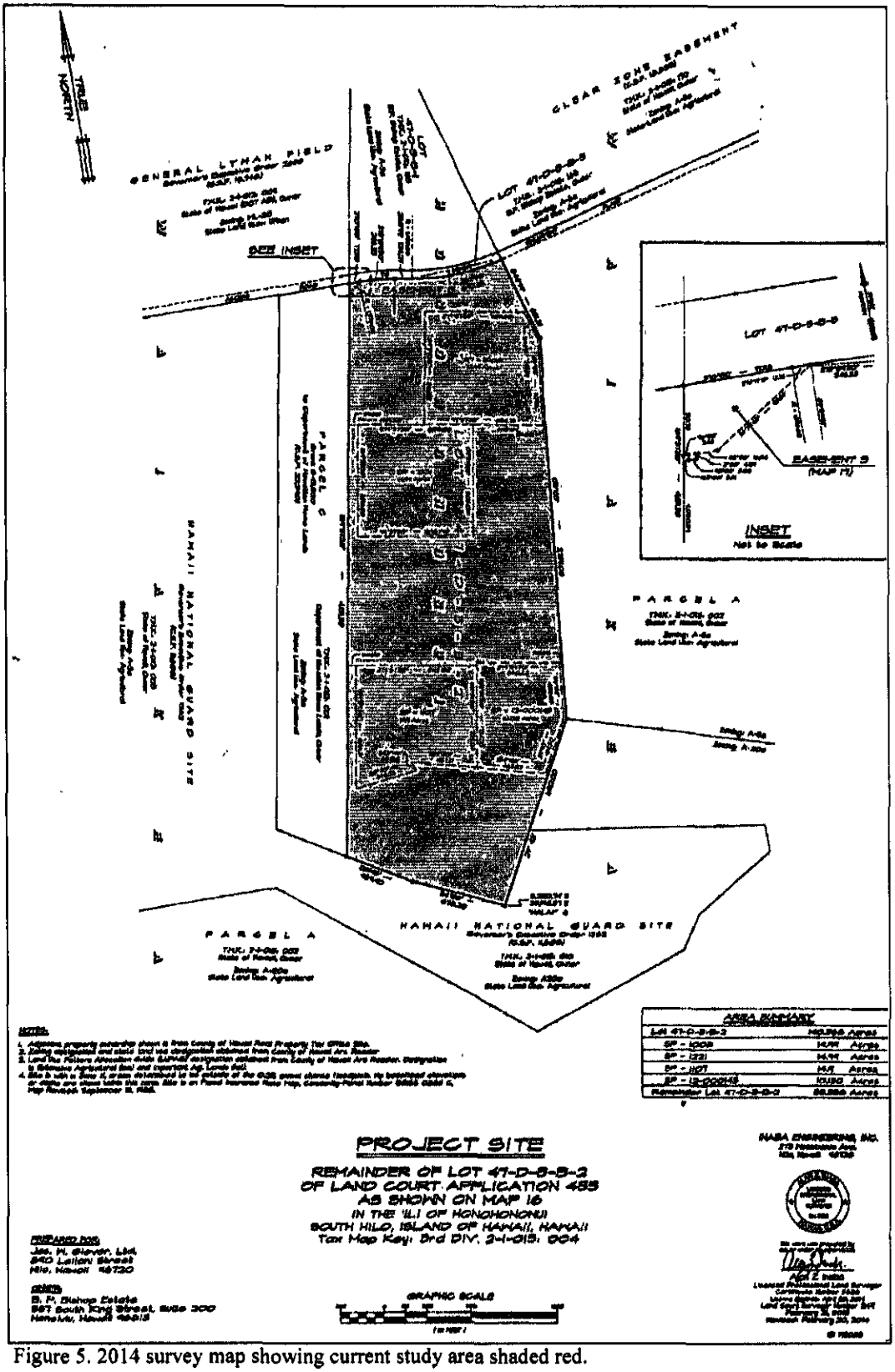

Figure 5. 2014 survey map showing current study area shaded red.

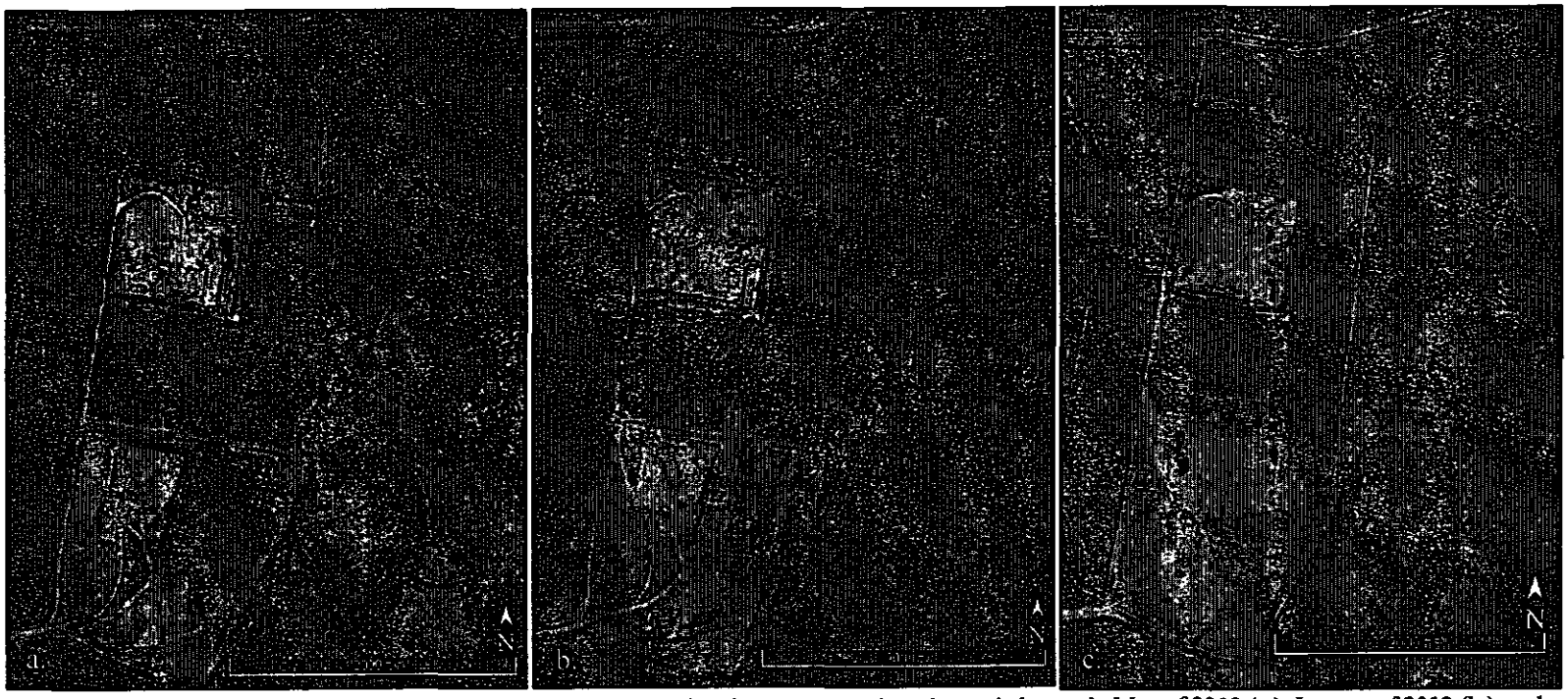

Figure 6. Comparison of satellite images of the current project area showing access roads and quarried areas in May of 2012 (a.), January of 2013 (b.), and August of 2014 (c.).

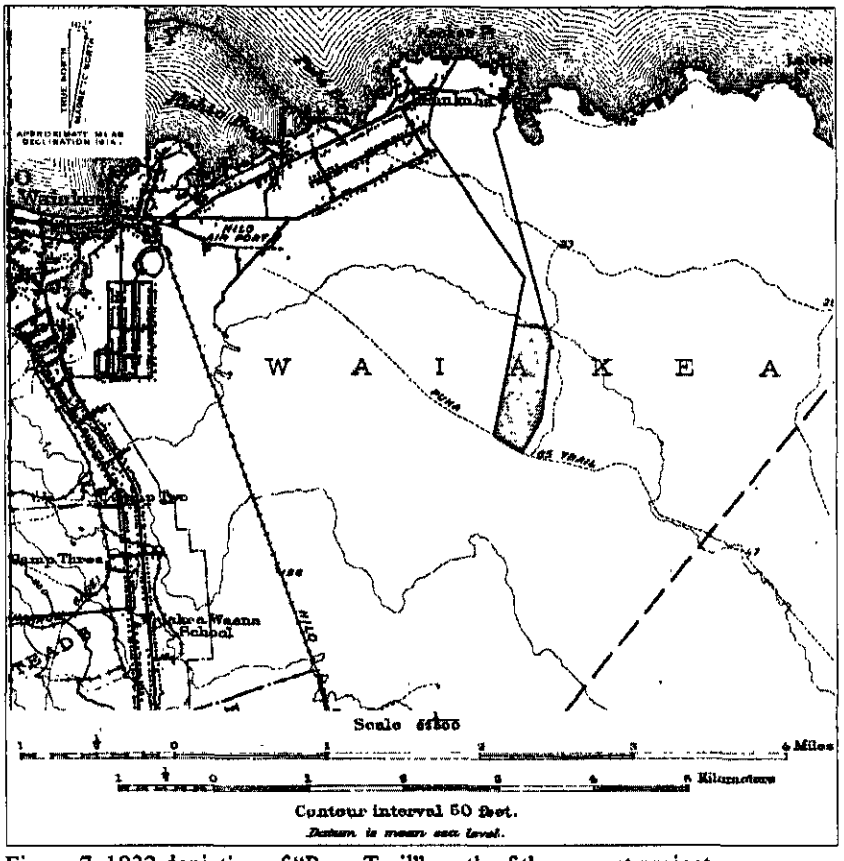

Figure 7. 1932 depiction of "Puna Trail" south of the current project area (shaded red).

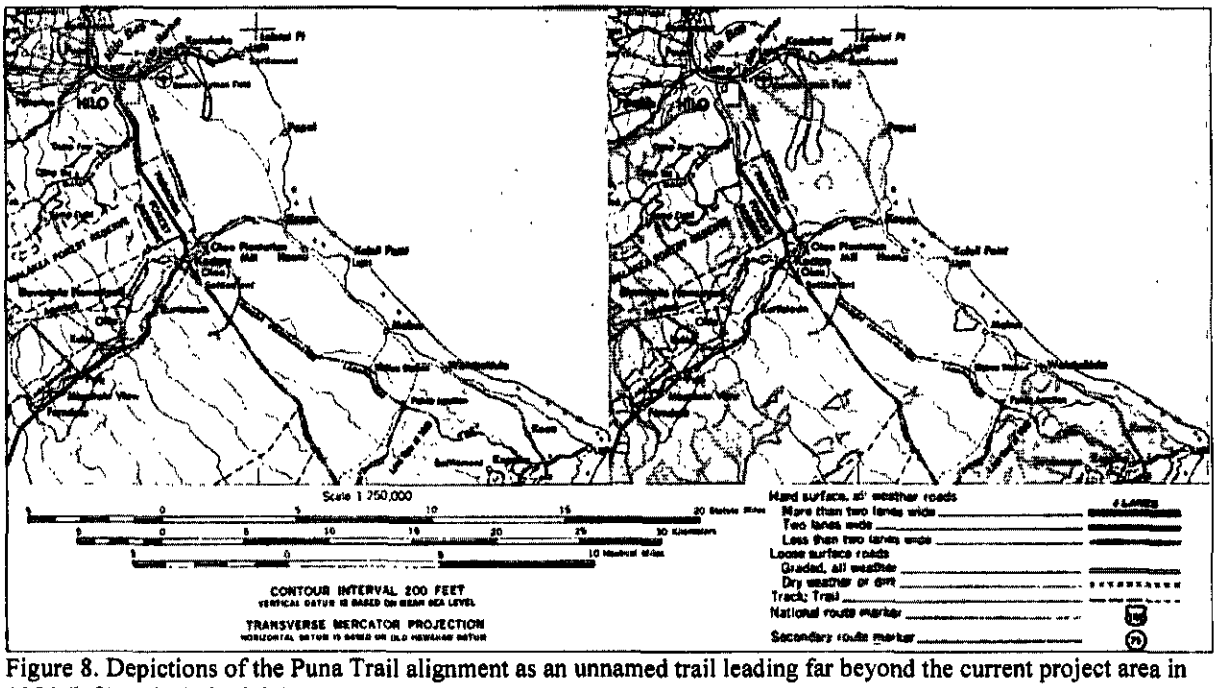

Figure 8. Depictions of the Puna Trail alignment as an unnamed trail leading far beyond the current project area in 1954 (left) and 1959 (right).

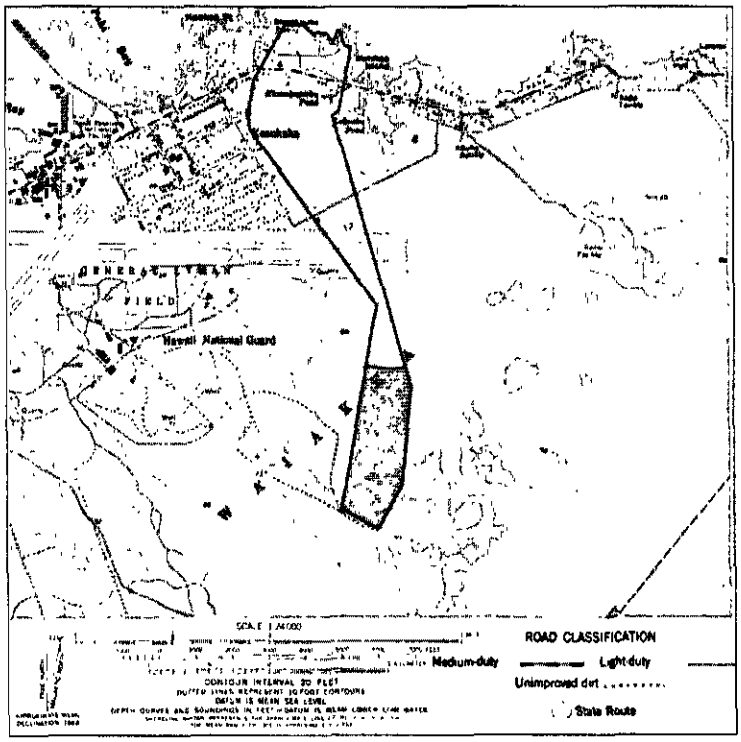

Figure 9. 1963 depiction of the former Puna Trail alignment as an unmarked dirt road terminating near the current project area (shaded red).

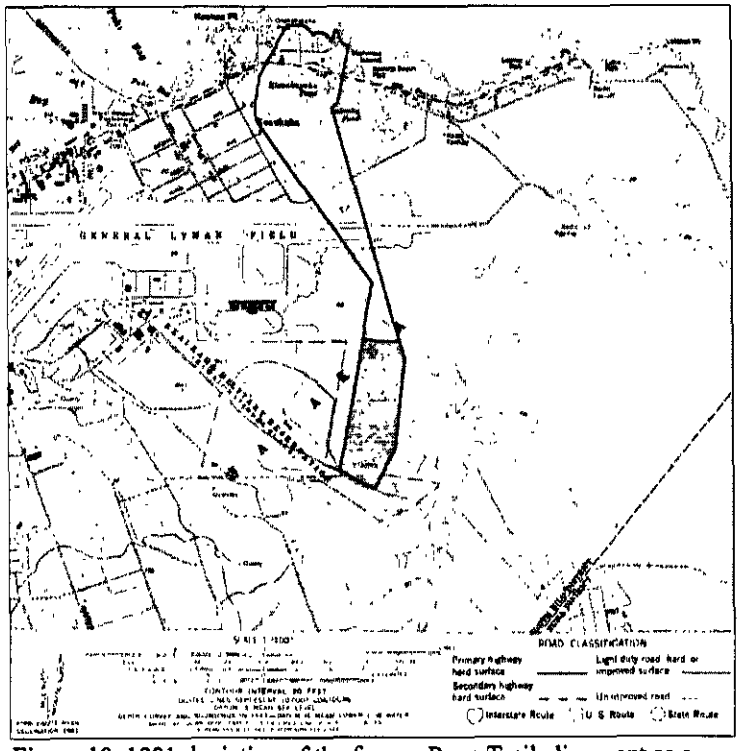

Figure 10. 1981 depiction of the former Puna Trail alignment as a light-duty road, current project area shaded red.