

An Archaeological Monitoring Report for the Caltech Submillimeter Observatory Decommissioning Project on Mauna Kea

TMK: (3) 4-4-015:009 (por.)

Ka'ōhe Ahupua'a
Hāmākua District
Island of Hawai'i

DRAFT VERSION



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MANAGEMENT SUMMARY

ASM Affiliates has prepared this Archaeological Monitoring Report at the request of California Institute of Technology for ground disturbing activities associated with the Caltech Submillimeter Observatory Decommissioning Project on Mauna Kea located at Tax Map Key (TMK: [3] 4-4-015:009 [por.]), Kaʻohe Ahupuaʻa, Hāmākua District, Island of Hawaiʻi. The decommissioning project included the complete removal of improvements within the Caltech Submillimeter Observatory lease area and the restoration of the site. Specific ground disturbing activities included: excavation for rebar posts to construct a perimeter fence around the observatory; installation of silt erosion fencing; demolition of the water pump shed and outbuilding structures, and their concrete foundations; excavation and removal of the existing 2,000-gallon water tank, cesspool, and electrical conduits; and grading of the current project area to facilitate site restoration.

Archaeological monitoring for the current project occurred on September 13, 2022, April 18, 2024, May 28, 2024, through June 28, 2024, and included on-site monitoring of all ground disturbing activities. Matthew R. Clark, M.A., served as the Principal Investigator for the project, with on-site monitoring conducted by Robynn Namnama, B.A., and Colsen Balai, B.A. Archaeological monitoring adhered to procedures outlined in Hawaiʻi Administrative Rules 13§13-279-5 *Rules Governing Minimal Standards for Archaeological Monitoring Studies and Reports*.

No archaeological sites or subsurface features were encountered during the course of the project; and as a result, no historic properties were affected by the ground-disturbing activities associated with the Caltech Submillimeter Observatory Decommissioning Project.

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1. INTRODUCTION

ASM Affiliates (ASM) has prepared this Archaeological Monitoring Report (AMR) at the request of California Institute of Technology (Caltech) for ground disturbing activities associated with the Caltech Submillimeter Observatory (CSO) Decommissioning Project on Mauna Kea. The CSO is located on 0.75 acres subleased from the State of Hawai‘i within the Mauna Kea Science Reserve on a portion of TMK: (3) 4-4-015:009 in Ka‘ohe Ahupua‘a, Hāmākua District, Island of Hawai‘i. The CSO is a 10.4-meter (34 feet) diameter telescope that was engaged in astronomical observations from 1986 until it ceased operation on September 8, 2015. As specified in the Archaeological Monitoring Plan (AMP), the project area (Figures 1, 2, and 3) comprises approximately 9.6 acres and includes the 0.75-acre sublease area and other minor adjacent areas that were disturbed during the original construction or will be disturbed during the decommissioning of the CSO, along with the “Batch Plant” area located southeast of the CSO lease area.

The decommissioning project included the complete removal of improvements within the CSO lease area and the restoration of the site. Fill material deposited during the construction of the CSO facility was removed and transported to an approved alternative location in the “Batch Plant” area located southeast of the CSO facility. But no ground disturbance was conducted within the “Batch Plant” area. Specific ground disturbing activities associated with the CSO Decommissioning Project included: excavation for rebar posts to construct a perimeter fence around the observatory; installation of silt erosion fencing; demolition of the water pump shed and outbuilding structures, and their concrete foundations; excavation and removal of the existing 2,000-gallon water tank, cesspool, and electrical conduits; and grading of the current project area to facilitate site restoration. Decommissioning of the CSO was conducted in accordance with the 2010 Board of Land and Natural Resources approved *Mauna Kea Comprehensive Management Plan: UH Management Areas* (CMP) prepared by Ho‘akea (2009), the *Decommissioning Plan for the Mauna Kea Observatories* (Decommissioning Plan) prepared by Sustainable Resources Group Int’l (2010), the site specific *Site Decommissioning Plan for the Caltech Submillimeter Observatory* prepared by Planning Solutions (2021), and the *Cultural Resources Management Plan for the University of Hawaii Management Areas on Mauna Kea* (CRMP) prepared by McCoy and Nees (2009). The CSO facility site was included in two Archaeological Inventory Surveys (AIS) (Barna 2020; McCoy and Nees 2010), neither of which identified historic properties within the project area. As a result of the Barna (2020) AIS, the Department of Land and Natural Resources-State Historic Preservation Division (DLNR-SHPD) concurred with the recommendation of archaeological monitoring in a letter dated October 29, 2021 (Project No. 2021PR00975, Doc. No. 2110SN17; Appendix A). The archaeological monitoring was conducted for identification purposes based on the presence of numerous historic properties on Mauna Kea and because surface and subsurface historic properties have been previously identified within the general vicinity including within the project’s viewshed. An AMP was subsequently prepared by Barna (2021) and accepted by the DLNR-SHPD in a letter dated December 16, 2021 (Project No. 2021PR00975, Doc. No. 2112SN11; Appendix A).

Archaeological monitoring was conducted for identification measures in the event that previously unidentified archaeological properties were encountered during the project. Archaeological fieldwork was conducted pursuant to the approved AMP for the project (Barna 2021) which specified on-site monitoring during all ground disturbing activities. The archaeological monitoring adhered to procedures outlined in Hawai‘i Administrative Rules (HAR) §13-279 *Rules Governing Minimal Standards for Archaeological Monitoring Studies and Reports*. This AMR offers a description of the project area and the monitoring effort, including preconstruction meeting and notifications, field methods, and construction activities, and concludes with a summary of the findings of archaeological monitoring conducted for the CSO Decommissioning Project.

This topographic map displays the Pu'uwaiau area in Hawaii County. The map features contour lines indicating elevation, with major peaks labeled: Pu'uwaiau (13,000 ft), Pu'uwaiau (12,800 ft), Pu'uwaiau (12,600 ft), Pu'uwaiau (12,400 ft), Pu'uwaiau (12,200 ft), Pu'uwaiau (12,000 ft), Pu'uwaiau (11,800 ft), Pu'uwaiau (11,600 ft), Pu'uwaiau (11,400 ft), Pu'uwaiau (11,200 ft), Pu'uwaiau (11,000 ft), Pu'uwaiau (10,800 ft), Pu'uwaiau (10,600 ft), Pu'uwaiau (10,400 ft), Pu'uwaiau (10,200 ft), Pu'uwaiau (10,000 ft), Pu'uwaiau (9,800 ft), Pu'uwaiau (9,600 ft), Pu'uwaiau (9,400 ft), Pu'uwaiau (9,200 ft), Pu'uwaiau (9,000 ft), Pu'uwaiau (8,800 ft), Pu'uwaiau (8,600 ft), Pu'uwaiau (8,400 ft), Pu'uwaiau (8,200 ft), Pu'uwaiau (8,000 ft), Pu'uwaiau (7,800 ft), Pu'uwaiau (7,600 ft), Pu'uwaiau (7,400 ft), Pu'uwaiau (7,200 ft), Pu'uwaiau (7,000 ft), Pu'uwaiau (6,800 ft), Pu'uwaiau (6,600 ft), Pu'uwaiau (6,400 ft), Pu'uwaiau (6,200 ft), Pu'uwaiau (6,000 ft), Pu'uwaiau (5,800 ft), Pu'uwaiau (5,600 ft), Pu'uwaiau (5,400 ft), Pu'uwaiau (5,200 ft), Pu'uwaiau (5,000 ft), Pu'uwaiau (4,800 ft), Pu'uwaiau (4,600 ft), Pu'uwaiau (4,400 ft), Pu'uwaiau (4,200 ft), Pu'uwaiau (4,000 ft), Pu'uwaiau (3,800 ft), Pu'uwaiau (3,600 ft), Pu'uwaiau (3,400 ft), Pu'uwaiau (3,200 ft), Pu'uwaiau (3,000 ft), Pu'uwaiau (2,800 ft), Pu'uwaiau (2,600 ft), Pu'uwaiau (2,400 ft), Pu'uwaiau (2,200 ft), Pu'uwaiau (2,000 ft), Pu'uwaiau (1,800 ft), Pu'uwaiau (1,600 ft), Pu'uwaiau (1,400 ft), Pu'uwaiau (1,200 ft), Pu'uwaiau (1,000 ft), Pu'uwaiau (800 ft), Pu'uwaiau (600 ft), Pu'uwaiau (400 ft), Pu'uwaiau (200 ft), Pu'uwaiau (0 ft). The map includes a scale bar (0 to 1 km) and a north arrow. An inset map shows the location of the study area within the Hawaiian Islands. The 'Current project area' is highlighted in red, located near the Pu'uwaiau peak.

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AMR for the CSO Decommissioning Project, Ka‘ohe, Hāmākua, Hawai‘i

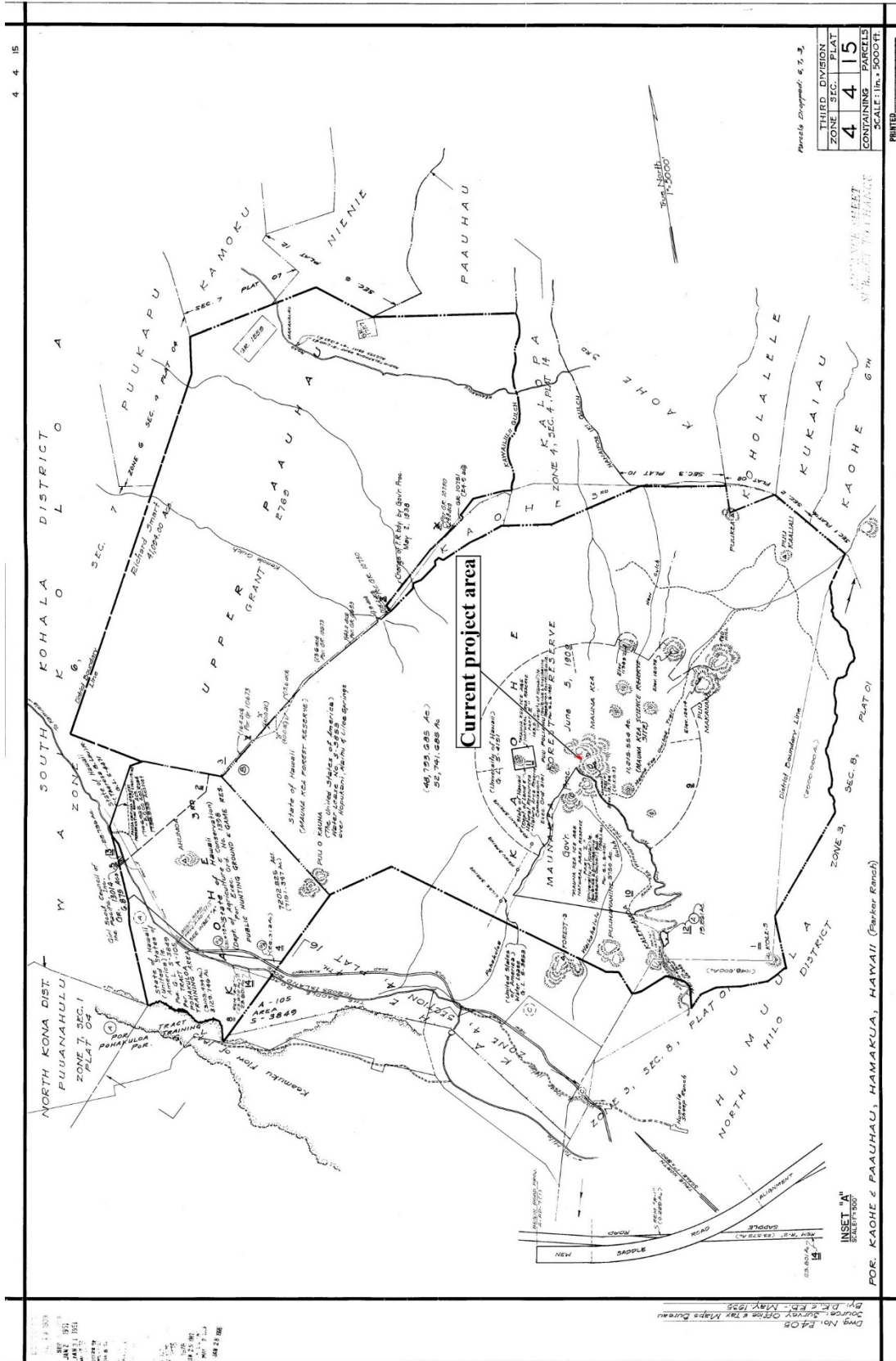


Figure 2. Tax Map Key (3) 4-4-015 showing location of current project area.



Figure 3. Google Earth™ satellite image showing the current project area (outlined in red)

PROJECT AREA DESCRIPTION

The current project area (Figures 4 and 5) comprises 1.3 acres where ground disturbance and/or the operation of mechanical equipment will occur during the decommissioning process (see Figure 3). This area is located at 13,350 feet altitude near the summit of Mauna Kea on a plateau surrounded by Pu‘upoli‘ahu, Pū‘uhau‘oki, and Pū‘uwēkiu (see Figure 1). It includes the 0.75-acre CSO facility, a 460 meter portion of Mauna Kea Access Road, and the batch plant located downhill (southeast) of the telescope site, which served as the location of the fill material excavated from the site. The CSO facility (see Figure 4) is located within the Mauna Kea Science Reserve (TMK: [3] 4-4-015:009).

Geology in the project area (Figure 6) consists of Laupahoehoe Volcanics comprising a hawaiitic ‘a‘ā flow which vented, probably from one of the summit cones, and flowed primarily northwest with one lobe extending to the south (Group 70 International 1982). McCoy (1982) reported evidence of glaciation in the form of striations, polish, and boulder erratics in the then-proposed CSO site, and these kinds of features are visible outside the current study area. The occurrence of lava tubes in such ‘a‘ā flows are reported to be rare. Natural soils in this portion of the summit region are extremely limited and are mapped as Lava flows-Cinder land (labeled 8 in Figure 7), which derives from ‘a‘ā weathering in place. The natural ground surface slopes generally toward the south; however, grading for the construction of the CSO has created a level, cinder-covered ground surface around the telescope and its outbuildings. As originally constructed, the CSO facilities were primarily built on or in fill obtained from other locations on Mauna Kea. Surveys indicates that approximately 2,830 cubic yards of fill were emplaced on the CSO site during construction of the CSO facility in the 1980s. The maximum depth of the fill currently on the site is approximately 10 feet on the downslope, southeast side of the CSO site.

Hydrologically, the ‘a‘ā underlying the CSO is highly permeable. The nearest surface water is at Lake Wai‘au, located 4,000 feet to the southeast of the CSO facility. Average daytime maximum temperature is 50.1 degrees Fahrenheit and average minimum temperature is 24.8 degrees Fahrenheit. Precipitation averages 8.07 inches per year (Giambelluca et al. 2013) in the form of freezing fog or snow. Above 12,800 feet elevation on Mauna Kea, the ecosystem is classified as Alpine Stone Desert (Gerrish 2013). Vascular plants are very widely scattered and include two native grasses, *Trisetum glomeratum* (*pili uka*) and *Agrostis sandwicensis* (Hawaii bentgrass); and the endemic fern *Asplenium adiantum-nigrum* (*‘iwa ‘iwa*).



Figure 4. Caltech Submillimeter Observatory facility, view to the southwest.



Figure 5. Portion of project area south of Caltech Submillimeter Observatory facility (the “Batch Plant”), view to the southeast.

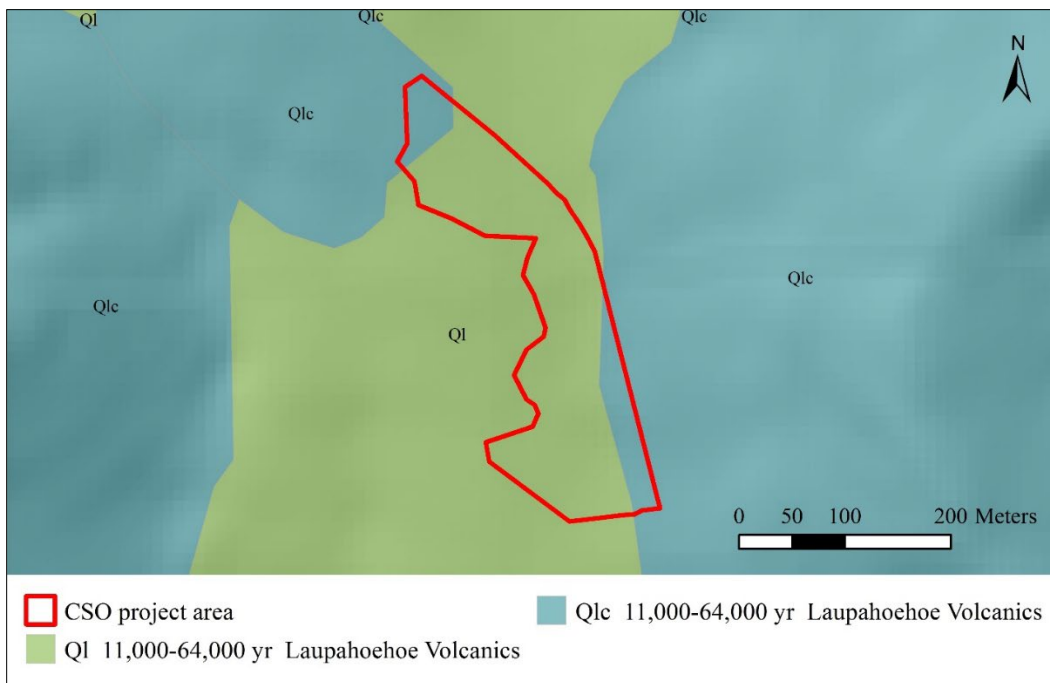


Figure 6. Geology in the vicinity of the project area.

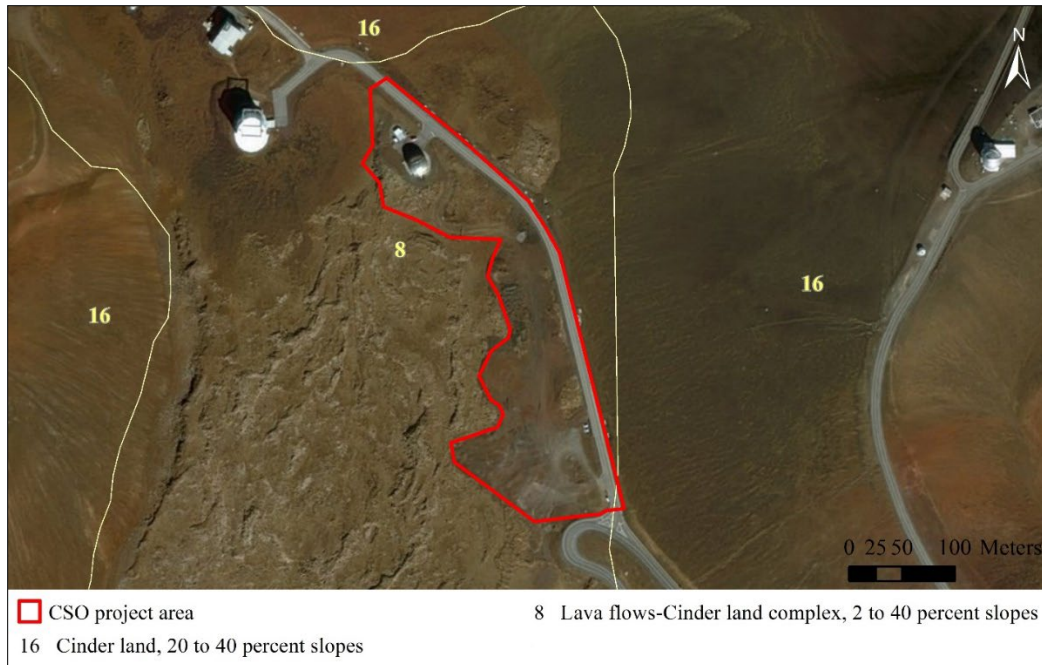


Figure 7. Soils in the vicinity of the project area.

2. THE MONITORING EFFORT

ASM conducted on-site archaeological monitoring for all ground disturbing activities associated with the CSO Decommissioning Project on Mauna Kea. Archaeological monitoring for the current project occurred on September 13, 2022, April 18, 2024, and May 28, 2024 through June 28, 2024 (last official day of monitoring). Matthew R. Clark, M.A. served as the Principal Investigator for the project, with on-site monitoring conducted by Robynn Namnama, B.A., and Colsen Balai, B.A. No historic properties were encountered as a result of the monitoring effort.

PRECONSTRUCTION MEETING AND NOTIFICATIONS

Prior to the commencement of ground-disturbing activities, both the Principal Investigator and the archaeological monitor met with the construction supervisor and excavation crew to discuss the procedures for monitoring. It was explained that the monitoring archaeologist has the authority to halt construction activities in the event that cultural resources are encountered and that DLNR-SHPD will be contacted. DLNR-SHPD was notified at the on-set and completion of the on-site monitoring activities. An archaeological monitor was on-site during all of the excavation work.

FIELD METHODS

The monitoring fieldwork followed procedures outlined in the AMP (Barna 2021). As stipulated in that plan, a qualified archaeological monitor was present on-site to observe all ground-disturbing activities associated with the proposed project. Daily monitoring logs were generated, and photographs were taken of the project area and construction activities throughout the project. The on-site monitor inspected all exposed soil and examined the stratigraphic profiles of any deep cuts. A representative stratigraphic scaled profile was prepared to document the stratigraphy. Photographs of the profile location were also taken, and the soils were described using standard USDA soil descriptions and Munsell color charts. The location of the profile was recorded using a handheld Garmin GPSMAP 64sx unit and plotted on a map of the project area; the profile is presented and described later in this report. The monitoring logs and photographs generated during this project are archived at ASM's Hilo office. No subsurface archaeological features were encountered during the ground disturbing activities associated with this project.

CONSTRUCTION ACTIVITIES

On September 13, 2022, construction activities that were monitored included manually hand pounding rebar posts for the fencing around the perimeter of the observatory (Figure 8). Each post was spaced 10-feet apart and hand pounded in the ground to a depth of 0.46 meters (one-and-a-half feet) below ground surface. Roughly a year and a half later, on April 18, 2024, silt erosion fencing was installed around the perimeter of the observatory (Figures 9, 10, and 11). The silt erosion fencing was buried roughly 10 centimeters (four inches) below the existing ground surface.

Consistent on-site archaeological monitoring for ground disturbance commenced on May 28, 2024, and lasted through June 24, 2024 (last official day of monitoring). Specific construction activities that were monitored included: demolition of the concrete foundation of the observatory (Figures 12 and 13); demolition of the water pump shed and outbuilding structures, and their concrete foundations; and the excavation and removal of the existing 2,000-gallon water tank (Figures 14, 15, and 16); excavation and removal of the existing cesspool (Figures 17 and 18); excavation and removal of the existing electrical conduits (Figures 19, 20, and 21). Equipment that was used to accomplish the above tasks included multiple excavators (i.e. Volvo 350, Deere 245P and 350P) as well as a CAT 950GC front end loader.

A representative profile drawing was prepared of the north-facing wall of the existing cesspool location (Figure 22). The profile revealed four stratigraphic layers (Layers I through IV; Figures 23 and 24). Layer I consisted of approximately a 183-centimeter-thick (six feet) layer of construction fill of small to large cobbles and large boulders, and very dark brown (10YR 2/2) loamy sand with weak/gritty crumb structure, smooth and abrupt boundary. Layer II consisted of an approximately 40- to 80-centimeter thick (1.3-2.6 feet) layer of black cinder fill, containing no cultural material. Immediately below this strip of black cinder fill is another approximately 100-centimeter-thick (3.2 feet) of construction fill (Layer III). At 300 centimeters (9.8 feet) below ground surface a second layer of the black cinder fill (Layer IV) is present once again. This fill layer extends to a depth of 395 centimeters (approximately 13 feet) below ground surface to the base of the excavation. The stratigraphic sequence appears to be the product of the construction of the CSO Telescope, during which the area was graded prior to the construction of the finished telescope.

The grading of the project area for the decommissioning project required excavation depths ranging from depths of two to six feet. The goal of this project was to restore the site to its natural landscape by loosening the construction fill, which consisted of small to large cobbles and large boulders. Using both excavators, Deere 245P and 350P equipped with a 32-inch and 60-inch buckets respectively to conduct the work (Figures 25, 26, and 27). Finished look of the current project area displayed a rocky terrain (Figures 28, 29, and 30). Following the finish grading of the project area, the existing asphaltic driveway entrance was completely removed and the adjacent roadway was restriped (Figures 31, 32, and 33).

Photographs of the project area taken by Goodfellow Brothers, Inc. (GBI), on April 26, 2024 prior to decommissioning and on June 28, 2024 post-decommissioning show what the project looked like at the start of monitoring and afterwards (Figures 34 and 35). No cultural materials or subsurface archaeological features were encountered as a result of the ground-disturbing activities associated with this project.



Figure 8. Rebar posts with yellow caution tape wrapped around for fencing around the perimeter of the observatory, view to the southwest.



Figure 9. Silt erosion fencing around the perimeter of the observatory, view to the southeast.

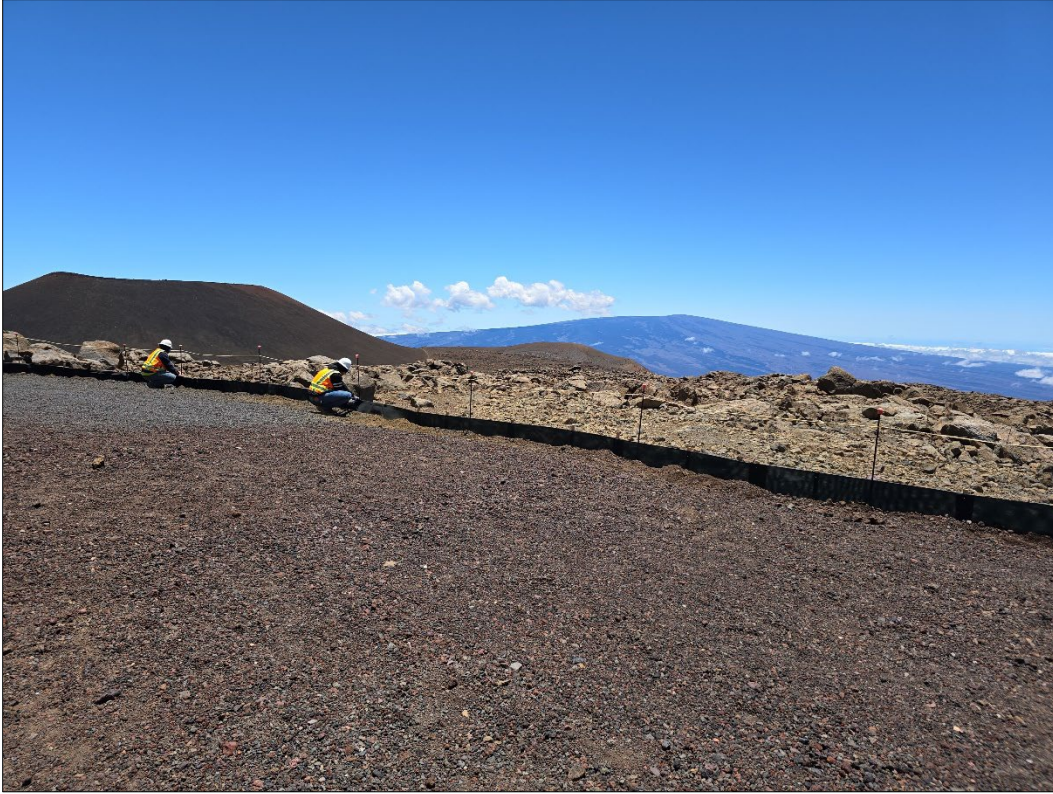


Figure 10. Silt erosion fencing around the perimeter of the observatory, view to the south.



Figure 11. Silt erosion fencing around the perimeter of the observatory, view to the north.



Figure 12. Deere 350P with a hydraulic hammer attachment hoe ramming the concrete ring foundation of the observatory, view to the south.



Figure 13. Post-hoe ramming of the concrete foundation of the observatory, view to the north.



Figure 14. Deere 350P with a hydraulic hammer attachment hoe ramming the concrete foundation of the water pump shed, view to the south.



Figure 15. Volvo 350 with a 60-inch bucket removing the water pump shed, view to the southeast.



Figure 16. Deere 245P removing the 2,000-gallon water tank, view to the west.



Figure 17. Deere 245P excavating out the existing cesspool, view to the south.



Figure 18. Deere 245P removing the cesspool structure, view to the west.



Figure 19. Deere 245P with a 32-inch bucket removing the electrical conduit concrete pad, view to the southwest.



Figure 20. Deere 245P with a 32-inch bucket removing the electrical conduit concrete pad, view to the southwest.



Figure 21. Deere 245P with a hydraulic hammer attachment to remove more of the electrical conduit concrete pad, view to the southwest.



Figure 22. Google Earth™ satellite image showing location of Profile 1. The current project area (outlined in red).

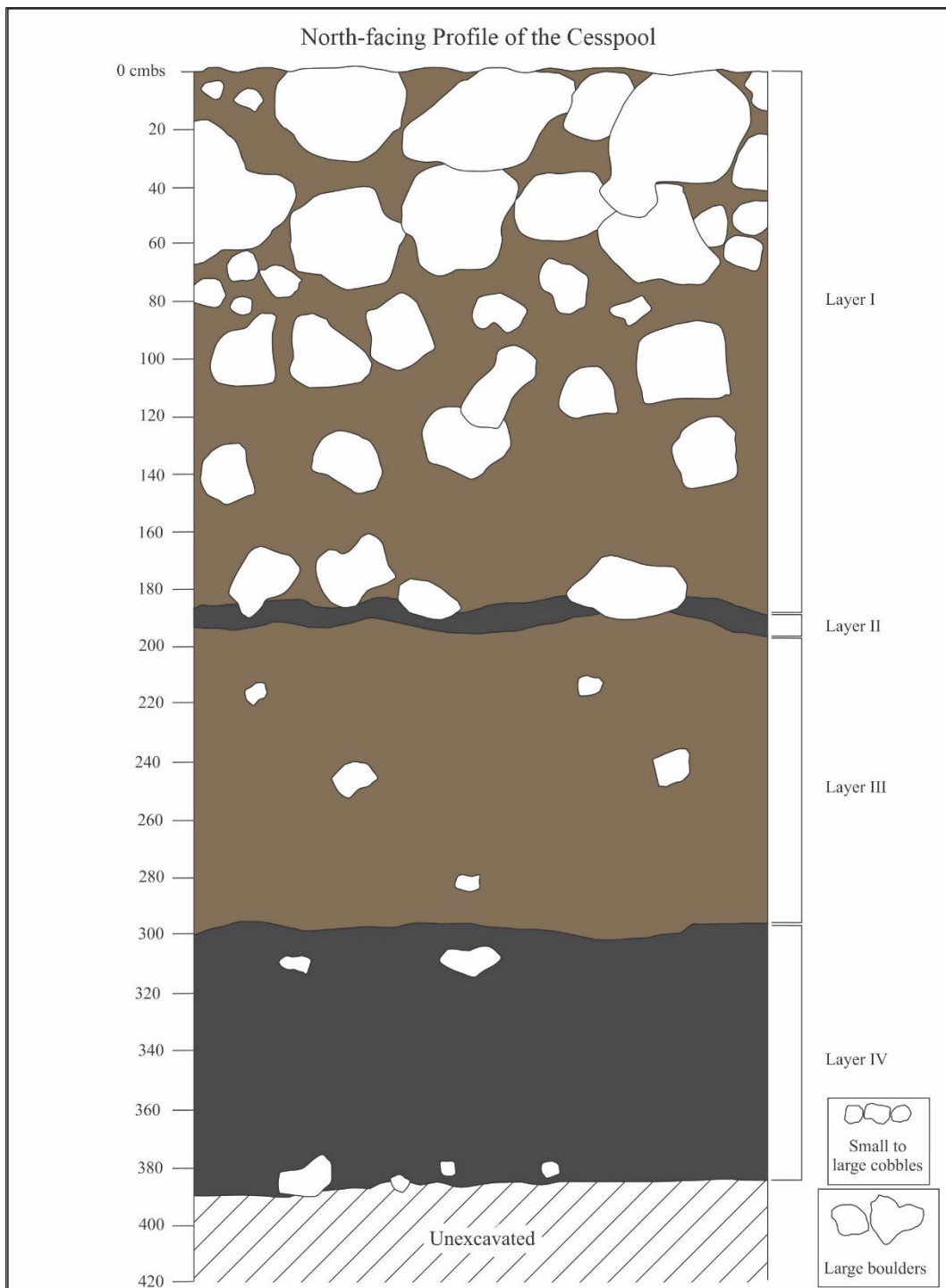


Figure 23. North-facing profile (Profile 1) of excavation for the removal of the existing cesspool.



Figure 24. Photograph of the north-facing wall of the cesspool area, view to the north.



Figure 25. Deere 245P with a 32-inch bucket grading of the project area, view to the southwest.



Figure 26. Deere 350P with a 60-inch bucket grading of the project area, view to the southeast.



Figure 27. Deere 350P with a 60-inch bucket grading of the project area, view to the south.



Figure 28. Finished grading of the project area, view to the west.

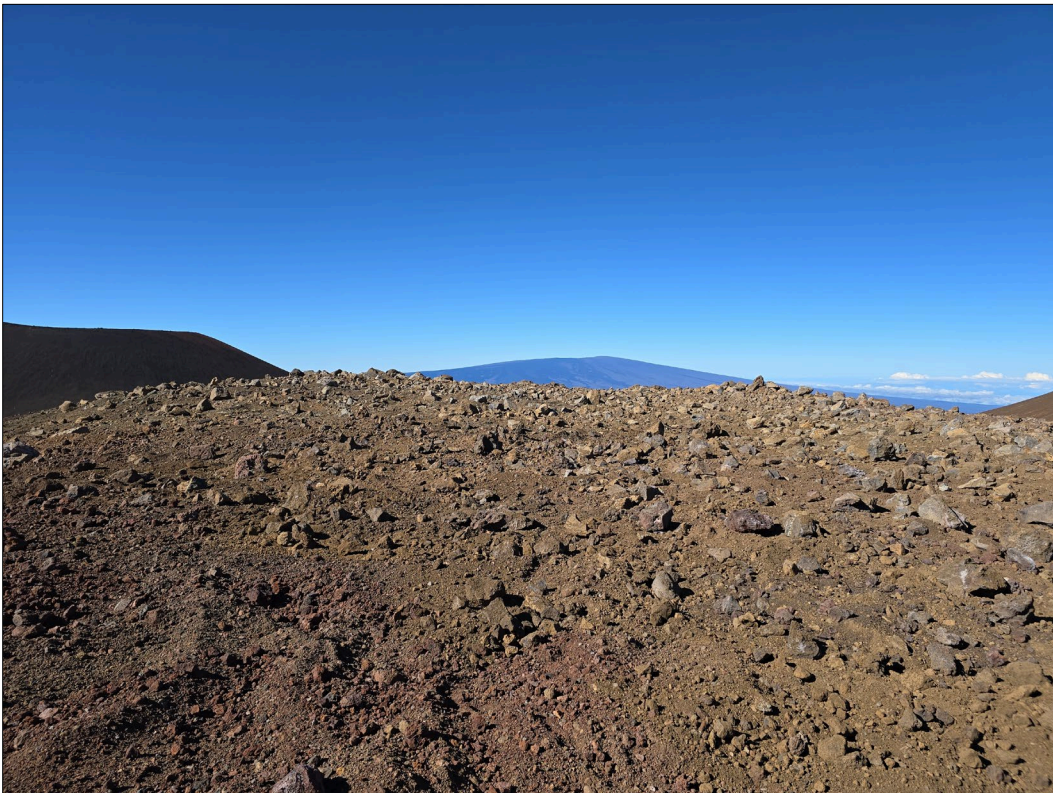


Figure 29. Finished grading of the project area, view to the south.



Figure 30. Finished grading of the project area, view to the north.



Figure 31. Deere 350P with hydraulic hammer attachment to remove the existing asphaltic driveway entrance, view to the south.



Figure 32. Complete removal of the asphaltic driveway entrance, view to the southeast.



Figure 33. Restriping of the existing asphaltic road surface, view to the southwest.

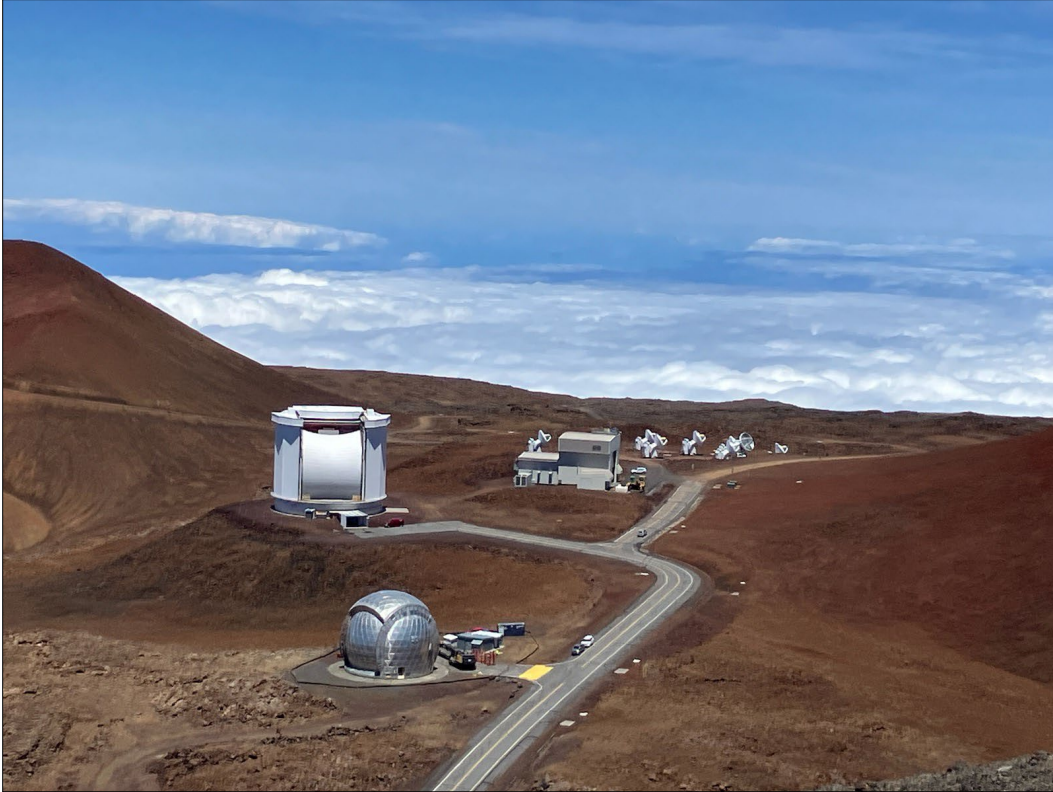


Figure 34. Photograph of the overall project area prior to decommissioning taken on April 26, 2024, provided by Goodfellows Brothers, Inc. (GBI), view to the west.



Figure 35. Photograph of the overall project area post-decommissioning taken on June 28, 2024, provided by Goodfellows Brothers, Inc. (GBI), view to the west.

3. CONCLUSION

On September 13, 2022, April 18, 2024, and May 28, 2024, through June 28, 2024 (last official day of monitoring), ASM conducted archaeological monitoring during ground-disturbing activities on TMK: (3) 4-4-015:009 (por.) for the CSO Decommissioning Project. No archaeological sites or subsurface features were encountered during the course of the project and, as a result, no historic properties were affected by the ground-disturbing activities associated with the decommissioning. These results are consistent with the project's anticipated low potential for encountering historic properties.

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APPENDIX A SHPD CORRESPONDENCE



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GOVERNOR OF
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**STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES**

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CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

October 29, 2021

Sam Lemmo, Administrator
Department of Land and Natural Resources
Office of Conservation and Coastal Lands
1151 Punchbowl St. #131
Honolulu, HI 96813
Attn. Rachel Beasley
Email: rachel.beasley@hawaii.gov

IN REPLY REFER TO:
Project No.2021PR00975
Doc. No. 2110SN17
Archaeology

Dear Mr. Lemmo:

SUBJECT: **Chapter 6E-8 Historic Preservation Review
Request for Concurrence with Project Effect Determination
Caltech Submillimeter Observatory Decommissioning Project
Archaeological Assessment Report
Ka'ohē Ahupua'a, Hāmākua District, Island of Hawai'i
TMK: (3) 4-4-015:009**

This letter provides the State Historic Preservation Division's (SHPD's) review of the proposed project and the request from the Department of Land and Natural Resources Office of Conservation and Coastal Lands (OCCL) for concurrence with a project effect determination of "no historic properties affected" for the proposed decommissioning of the Caltech Submillimeter Observatory (CSO). The applicant, California Institute of Technology (Caltech), proposes to decommission its 10.4-meter (34 ft) diameter telescope. The SHPD received this submittal on August 16, 2021. The submittal includes the OCCL's cover letter, an HRS 6E Submittal Form, the CSO site map, and an archaeological inventory survey (Barna 2021) titled "*An Archaeological Assessment for the Caltech Submillimeter Observatory Decommissioning Project on Maunakea, TMK (3) 4-4-015:009 (por.), Ka'ohē Ahupua'a Hāmākua District Island of Hawai'i*" (Barna, Jan. 2021) conducted in support of OCCL's determination of effect pursuant to HRS Chapter 6E-8.

The Mauna Kea Science Reserve and Hale Pōhaku mid-level facility totals 11,288 acres. The proposed project area is located at 13,350 feet altitude near the summit of Mauna Kea, a plateau surrounded by Pu'upoli'ahu, Pū'uhaul'oki, and Pū'uwēkiu. It includes the 0.75-acre CSO facility, a 460-meter portion of Mauna Kea Access Road, and the batch plant located downhill (southeast) of the telescope site, which is anticipated to be used as a base yard/staging area. The CSO facility is located within the Astronomy Precinct of the Mauna Kea Science Reserve (TMK: (3) 4-4-015:009), and the majority of the road and base yard/staging area is located outside the Astronomy Precinct but within the Science Reserve. A gravel road extends to the southeast from the telescope facility and connects to the graded batch plant area. Caltech proposes to remove all aboveground and underground CSO components within the CSO site including, but not limited to, the observatory, outbuilding, foundations, cesspool, utilities, and grounding grid.

Project Description

The purpose of the CSO Decommissioning project is to enable Caltech to conclude its use of the site and surrender its sublease while satisfying its obligations, via Sublease H09176 and other agreements, to UH and the State of Hawai'i. Pursuant to the Decommissioning Plan, a subplan of the Mauna Kea Comprehensive Management Plan, the

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decommissioning of an astronomy facility in the Science Reserve is a multi-step process involving 1) a notice of intent, 2) an environmental due diligence review, 3) a site deconstruction and removal plan, and 4) a site restoration plan.

The submittal indicates that decommissioning includes removing all existing structures above and below ground infrastructure and restoring the site to pre-telescope construction. Existing aboveground structures present on the CSO Site include: the observatory building, an outbuilding, a water pump shed, and electrical equipment cabinets for a generator and transformer. Caltech proposes to remove all aboveground and underground CSO components within the CSO Site including, but not limited to, the observatory, outbuilding, foundations, cesspool, utilities, and grounding grid. The proposed restoration will include: (a) removing fill placed on the lava flow during construction; (b) filling cavities where excavation occurred with a portion of the fill placed on the lava flow during construction of the CSO, which is native to Mauna Kea; and (c) placing fine ash and small rocks, screened from the existing fill material, onto the site. The applicant proposes complete removal of all improvements on the CSO site and full restoration of the site, to the greatest extent possible, to its pre-construction condition.

Findings

A review of our records indicates that this project area has been included in several archaeological investigations. Prior to CSO construction, an archaeological survey was conducted by the B.P. Bishop Museum in support of the observatory's environmental impact statement. No archaeological sites were observed within the CSO project area; however, two shrines (SIHP 50-10-23-16165 and 50-10-23-16165) were located 188 meters and 250 meters, respectively, to the south-southwest of the CSO project. An archaeological inventory survey (Barna 2021) was conducted by ASM Affiliates to determine the possible impacts to historic properties within the project area. The report included the areas of direct effect that includes the 0.75-acre CSO facility, a 460-meter portion of Mauna Kea Access Road, and the batch plant located downhill [southeast] of the telescope site, which is anticipated to be used as a base yard/staging area. In addition, the report identified the area of visual impacts that was based on the 52-foot height of the CSO facility.

No historic properties were identified within the area of direct effect. Thus, pursuant to HAR §13-275-5(b)(5)(A), the negative AIS results are presented in an archaeological assessment (AA) report. The AA report indicates that 11 historic properties documented outside the area of direct effect, but within the area of visual effect, all of which were identified as contributing historic properties to the Mauna Kea Summit Region Historic District (SIHP 50-10-23-26869). These 11 historic properties consist of the following:

Site No. 50-10-23-	Site Type	No. of Features	Feature Types	Distance in meters (m) from Caltech Project Area
16164	Shrine	2	5, possibly 6 uprights	188 m SSE
16165	Shrine	1	2 uprights	250 m SSE
21438	Kūkahau'ula	1	Mauna Kea Summit (TCP)	149 m E
21440	Pu'u Waiau	1	Pu'u (TCP)	1,280 m S
26132	Possible Burial	2	Alignments	1,550 m SSE
26133	Cairn	1	Cairn	1,545 m SSE
26134	Possible burials, possible shrines, Marker/memorial, Unknown function	17	1 terrace, 1 mound/terrace, 4 pavements, 9 mounds, 2 rock piles	1,530 m S
26142	Workshop	1	Lithic Scatter	1,510 meters S
27579	USGS Marker	1	USGS marker	630 m W
27585	Workshop	1	4 adze manufacturing workshops; flakes, hammerstones, cores	2,530 meters SW
28623	Possible burial	4	4 mounds	930 meters SE

The AA report (Barna, Jan. 2021) indicates that the entire project area (direct impact) has been previously impacted by construction activities associated with the construction of the CSO facility. The area is covered with cinder-fill and is understood to be over bedrock. No additional historic properties have been identified within the current

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project area. The report indicates that it is unlikely that any newly identified historic properties exist within the current project area. The report also indicates that while newly identified historic properties are unlikely, new rock constructions identified as “find spots” may be present. The find spots fall under the jurisdiction of the Office of Mauna Kea Management, pursuant to the Mauna Kea Comprehensive Management Plan (Ho‘akea 2009).

The AA report (Barna, Jan. 2021) indicates that based on the negative findings in the survey, the CSO Decommissioning Project will have no direct effects on historic properties. The eleven previously identified historic properties (SIHP 16164, 16165, 21438, 21440, 26132, 26133, 26134, 26142, 27579, 27585, and 28623) in the indirect visual viewshed of the CSO facility, and the overall Mauna Kea Summit Region Historic District (SIHP 26869) will benefit from the removal of the above-ground facilities and improve the overall integrity of the eleven (11) sites and the historic district. The report recommends no further historic preservation work is need prior to the start of construction. However, archaeological monitoring is recommended as a precautionary measure to ensure protection of SIHP 21438 (Kūkahau‘ūla), which is adjacent to the Mauna Kea Summit Access Road and the lower portion of the CSO project area, and as a contingency for the discovery of unanticipated archaeological resources within the project area.

As a part of the draft environmental assessment (DEA) (July 2021) process, the CSO Decommissioning Project conducted outreach to provide information to the public and gather input on the proposed purpose, scope, potential impacts, and recommended mitigation measures for the proposed project. The DEA indicates that extensive consultation was conducted during the first four months of 2018 with government agencies, organizations, and individuals (a list is provided in the DEA). The summary provided in the DEA indicates that the broad public outreach was appreciated, the removal of the telescope was received favorably, with most people feeling the project would have a positive effect. Principle concerns identified during outreach related to the handling of the closure and removal of the cesspool at the CSO Site and residual impact associated with the 2009 hydraulic fluid leak.

In addition to consultation for the DEA, a cultural impact assessment (CIA; Rechtman 2020) was conducted for the proposed project. The CIA indicates that consultation invitations were sent out in June 2018 and a second round of consultation was conducted in July 2020. The AA report (Barna, Jan. 2021) recommends archaeological monitoring as a precautionary measure to ensure protection of Site 21438 (Kūkahau‘ūla), which is adjacent to the Mauna Kea Summit Access Road and the lower portion of the CSO project area, and as a contingency for the discovery of unanticipated archaeological resources. The CIA recommends that a cultural monitor be present when ground-altering activities are being conducted for the CSO decommissioning. The role of the on-site cultural monitor will be to provide an appropriate cultural orientation to individuals conducting on-site work, and to provide guidance on following cultural protocols during the decommissioning process.

Determination

SHPD concurs with OCCL’s project effect determination of “No historic properties affected.” SHPD also concurs with the recommendation of **archaeological monitoring for identification purposes** based on the presence of numerous historic properties on Mauna Kea and because surface and subsurface historic properties have been previously identified within the general vicinity including within the project’s viewshed.

The AA report (Barna, Jan. 2021) satisfies the requirements of HAR §13-276-5. **It is accepted.** Please send two hard copy of the AIS report, clearly marked FINAL, along with a text-searchable PDF copy of the report and copy of this review letter to the Kapolei SHPD office, attention SHPD Library. Additionally, please upload one text-searchable PDF of the Final report to HICRIS Project No. 2021PR00975 using the Project Supplement option, and a PDF copy of the report to Lehua.K.Soaresh@hawaii.gov.

SHPD looks forward to receiving an archaeological monitoring plan (AMP) meeting the requirements of HAR §13-279-4 for review and acceptance prior to start of construction activities for identification purposes during the decommissioning process and initial ground disturbance.

See SHPD website at: <http://dlnr.hawaii.gov/shpd/about/branches/archaeology> for a list of firms permitted to conduct archaeological work in Hawaii.

Please submit the AMP and associated review submittal fee to SHPD HICRIS Project No. 2021PR00975 using the Project Supplement option.

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SHPD shall notify OCCL when the archaeological monitoring plan has been accepted and project initiation may occur.

Please contact Sean Nāleimaile at (808) 933-7653 or at Sean.P.Naleimaile@hawaii.gov for questions regarding archaeological resources or this letter.

Aloha,

Alan Downer

Alan S. Downer, PhD
Administrator, State Historic Preservation Division
Deputy State Historic Preservation Officer

cc: Greg Chun, gchun711@hawaii.edu
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CONSERVATION AND RESOURCES ENFORCEMENT
ENGINEERING
FORESTRY AND WILDLIFE
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KAHOOLAWE ISLAND RESERVE COMMISSION
LAND
STATE PARKS

December 16, 2021

Sam Lemmo, Administrator
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IN REPLY REFER TO:
Project No. 2021PR00975
Doc. No. 2112SN11
Archaeology

Aloha Mr. Lemmo:

**SUBJECT: Chapter 6E-8 Historic Preservation Review –
Caltech Submillimeter Observatory Decommissioning Project
Archaeological Monitoring Plan
Ka'ohe Ahupua'a, Hāmākua District, Island of Hawai'i
TMK: (3) 4-4-015:009**

This letter provides the State Historic Preservation Division's (SHPD's) review of the draft archaeological monitoring plan (AMP) titled *Archaeological Monitoring Plan for the Caltech Submillimeter Observatory Decommissioning Project on Mauna Kea TMK: (3) 4-4-015:009 (por.) Ka'ohe Ahupua'a Hāmākua District Island of Hawai'i* (Barna, March 2021). The applicant, California Institute of Technology (Caltech), proposes to decommission its 10.4-meter (34 ft) diameter telescope. SHPD reviewed the project and an archaeological inventory survey (AIS) report (Barna 2021) and concurred with OCCL's determination of no historic properties affect. OCCL has proposed archaeological monitoring for identification purposes during any ground-disturbing activities within the current project area. In a letter dated October 29, 2021 (Log No. 2021PR00975, Doc. No. 2011SN17), SHPD concurred with the determination and proposed monitoring. SHPD received the current submittal on November 23, 2021.

Caltech proposes decommissioning of the Caltech observatory that consists of removing all existing structures above and below ground infrastructure and restoring the site to pre-telescope construction. Existing aboveground structures present on the CSO Site include: the observatory building, an outbuilding, a water pump shed, and electrical equipment cabinets for a generator and transformer. Caltech proposes to remove all aboveground and underground CSO components within the CSO Site including, but not limited to, the observatory, outbuilding, foundations, cesspool, utilities, and grounding grid. The proposed restoration will include: (a) removing fill placed on the lava flow during construction; (b) filling cavities where excavation occurred with a portion of the fill placed on the lava flow during construction of the CSO, which is native to Mauna Kea; and (c) placing fine ash and small rocks, screened from the existing fill material, onto the site. The applicant proposes complete removal of all improvements on the CSO site and full restoration of the site, to the greatest extent possible, to its pre-construction condition.

The draft AMP provides a scope of work, a summary of the archaeological investigations in the area, a summary of historic land use, and stipulates the following:

- A coordination meeting will be conducted between the construction team and monitoring archaeologist prior to construction activities so the construction team is aware of the monitoring provisions in the plan;

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- On-site monitoring will be conducted for all ground disturbing activities. One monitor is required for each piece of ground altering machinery during this project;
- The archaeological monitor has the authority to temporarily halt all activity in the area in the event of a potential historic property being identified, or to record archaeological information for cultural deposits or features;
- If non-burial historic properties are identified, documentation shall include, as appropriate, recording stratigraphy using USDA soil descriptions, GPS point collection, recordation of feature contents through excavation or sampling of features, screening of features, representative scaled profile drawings, photo documentation using a scale and north arrow, and appropriate laboratory analysis of collected samples and artifacts. Additionally, photographs and profiles of excavations will be collected from across the project area even if no significant historic properties are encountered.
- If human remains are identified, work will cease in the vicinity and the find shall be secured, and provisions outlined within the Hawaii Revised Statutes (HRS) §6E-43 and HAR §13-300-40, and any SHPD directives, shall be followed;
- Collected materials not associated with burials will be temporarily stored at the archaeological firm's office/laboratory until an appropriate curation facility is selected, in consultation with the landowner and the SHPD; and
- Any changes in these provisions shall occur only with written approval from the SHPD.

The plan meets the minimum requirements of HAR §13-279-4. **It is accepted.** Please send two hard copies of the document, clearly marked FINAL, and a copy of this letter to the Kapolei SHPD office, attention SHPD Library. Additionally, please send a text-searchable PDF copy of the final AMP to HICRIS Project No. 2021PR00975 using the Project Supplement option and a PDF copy to Lehua.K.Soareshawaii.gov.

SHPD hereby notifies the OCCL that the project initiation process may continue.

SHPD requests written notification via email and HICRIS at the start of archaeological monitoring. Within 30 days of completion of archaeological monitoring fieldwork, SHPD looks forward to receiving for review and acceptance a brief archaeological monitoring letter report of findings as specified in HAR §13-282-3(f)(1). Subsequently, SHPD looks forward to receipt of an archaeological monitoring report meeting the requirements of HAR §13-279-5 for review and acceptance.

When completed, **please submit** the draft archaeological monitoring report and accompanying submittal review fee to our office via HICRIS to Project 2021PR00975 using the Project Supplement option.

Please contact Sean Nāleimaile at (808) 933-7653 or at Sean.P.Naleimailehawaii.gov for any questions regarding archaeological resources or this letter.

Aloha,

Alan Downer

Alan S. Downer, PhD
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