

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
Honolulu, Hawaii

File No: HA-3880
180-Day Exp. Date: February 9, 2022

January 14, 2022

**Board of Land and
Natural Resources
State of Hawai'i
Honolulu, Hawai'i**

REGARDING: Conservation District Use Application (CDUA) HA-3880 for the Caltech Submillimeter Observatory (CSO) Decommissioning Project

APPLICANT: California Institute of Technology (Caltech)
Mail Code 206-31
1200 E. California Blvd.
Pasadena, CA 91125

APPROVING AGENCY: State of Hawai'i
Department of Land and Natural Resources
Office of Conservation and Coastal Lands

LOCATION: Ka'ohe, Hāmākua, Hawai'i

**TAX MAP KEYS
(TMK):** (3) 4-4-015:009 (por)

AREA OF PARCEL: .75 acres (subleased area) /1.3 acres (CSO site)¹(**SEE EXHIBIT 1**)

USE: Demolition and removal

SUBZONE: Resource

ATTACHMENTS: Exhibit 1: CSO site and subleased area map
Exhibit 2: Location map
Exhibit 3: Location of CSO in the Mauna Kea Science Reserve (MKSR)
Exhibit 4: Historic sites within the visual effects study area
Exhibit 5: SHPD letter

¹ The 1.3 acres 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 baseyard/staging area.

Exhibit 6: Batch plant and deconstruction staging maps
Exhibit 7: USFWS response letter
Exhibit 8: Notice of Intent to decommission letter
Exhibit 9: MKSR historic district and Traditional Cultural
Properties (TCP) boundaries in relation to CSO project map

ONLINE LIBRARY: [HTTPS://DLNR.HAWAII.GOV/OCCL/CURRENT-APPLICATIONS/](https://DLNR.HAWAII.GOV/OCCL/CURRENT-APPLICATIONS/)

DESCRIPTION OF AREA/CURRENT USE

The CSO site is located at 13,350 feet and its construction began in 1983. The construction resulted in approximately 495 cubic yards of material being cut and approximately 2,830 cubic yards of fill being deposited on the natural lava flow ground surface. The CSO is a 10.4-meter (34 ft) diameter telescope that was engaged in astronomical observations from 1986 until September 8, 2015. Existing aboveground structures present on the CSO site include: the observatory building; outbuilding; water pump shed; and electrical equipment cabinets for a generator and transformer. The CSO facilities were primarily built on fill obtained from other locations on Mauna Kea; approximately 2,830 cubic yards of fill were emplaced.

The CSO site is located in the Resource Subzone of the State Land Use Conservation District and is located in an area known as the Mauna Kea Science Reserve (MKSR) near the summit of Mauna Kea. The site is accessed via the Mauna Kea Access Road off the Daniel K. Inouye Highway, State Route 200, known locally as Saddle Road. (**SEE EXHIBIT 2**)

The principal rock type on the summit area is Hawaiite, which commonly forms clinker a‘a lava flows or cindercones. The CSO site is interpreted to originally be an a‘a lava flow which vented in the vicinity of the site. Fill was used during the construction of the observatory. The original fill material used on the site was not documented at the time of construction. It is believed that much or all of the site fill was sourced from a Laupāhoehoe series, which covers the summit of Mauna Kea.

The regional groundwater body below Mauna Kea’s summit is probably a dike-impounded high-level aquifer. It is “probable” because there is no direct confirmation of high-level water from drilling. The only surface water in the summit area is Lake Waiau, which is roughly 4,000 feet to the south of the site. The site is miles from any coastal waters or watershed.

Staff visited the CSO site on December 9, 2021.

Hazards

This project is to deconstruct and remove the observatory and to restore the site to the maximum extent practicable. It will not create any new structures or infrastructure; therefore, once the project is complete, the physical structures of the site will not be susceptible to natural hazards. The applicant has been in contact with County Fire Department officials to discuss fire-response related issues associated with this project.

The potential for renewed volcanic activity in the Mauna Kea summit region is extremely remote. Mauna Kea is considered a dormant volcano and any possible future eruptions would likely occur below the summit and not pose a threat to the CSO site. The project area is located in Flood Zone D of the Federal Emergency Management Area (FEMA), which is an unstudied area where flood

hazards are undetermined, but possible. There is no record of any flood occurring at or near the site. Because the CSO Decommissioning Project will not create any new structures or infrastructure, it is not susceptible to damage by seismic activity and will not increase the site's seismic vulnerability.

Flora and Fauna

The CSO site is located in the alpine stone desert ecosystem. This ecosystem limits the development of the plant and animal communities at the site. The plant community consists of lichens and mosses with sparsely distributed vascular plants. A survey conducted at the site observed eleven clumps of lichen. The most abundant vascular plant in and near the survey site was the endemic grass pili uka.

Arthropods are the most common fauna present in the alpine stone desert ecosystem. An arthropod survey was conducted, and the majority of species recorded were not native. One native spider (*Lycosa hawaiiensis*) and one native moth species (*Agrotis kuamauna*) were recorded, along with one fly species from an unknown origin. Wēkiu bugs are not normally found on lava flows, such as the CSO site, or in areas dominated by compacted ash/silt.

No recorded detections of birds or burrows are found in the vicinity of the CSO site. The endangered 'ōpe'ape'a (*Lasiurus cinereus semotus*) has not been detected in the vicinity of the CSO site but may occur at high elevations. No threatened or endangered species of flora or fauna were observed on the CSO site during the biological site assessment.

Historic/Cultural

There are no specific archaeological or historic features present on the CSO site, but the site is within the Mauna Kea Summit Region (MKSR) Historic District (SIHP Site No. 50-10-23-26869). **(SEE EXHIBIT 3)** ASM Affiliates conducted an archaeological survey for this project. The study reviewed “the direct study area,” where project ground disturbance may be anticipated to occur and “the visual effects study area,” which includes the viewshed of the CSO facility. No archaeological resources of any kind were identified within the direct effects study area. No find spots (ongoing cultural practices) were observed within the current study area.

The CSO site is within the viewshed of certain historic and cultural resources that contribute to the historic district. There are 11 historic properties within the view shed of the site. **(SEE EXHIBIT 4)** The two closest historic archaeological sites are two shrines (Site Nos. 50-10-23-16164 and -116165). No traditional or customary practices, beliefs, or resources have been identified on the site.

The Cultural Impact Assessment (CIA) was prepared by ASM Affiliates for this project. The CIA did not identify any practices that are exercised on the CSO site, but there are a wide variety of practices, beliefs, and resources associated with Mauna Kea's summit region. The CIA's recommendation is that the complete facility (above and below ground) be removed, and the affected environment be restored to the fullest extent possible. Caltech proposes complete removal of all above and underground facilities as well as full restoration of the site to its pre-construction condition, to the greatest extent practicable. Therefore the applicant states that the proposed project, in particular its goal of restoring the site to the maximum practicable extent, would have a beneficial effect on Native Hawaiian practices.

The State Historic Preservation Division (SHPD) concurred on October 29, 2021 with the project's effect determination of “No historic properties affected.” The SHPD also concurred 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 SHPD also determined the AA report satisfies the requirements of HAR §13-276-5 and the SHPD accepted the report. **(SEE EXHIBIT 5)**

PROPOSED USE

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. The Center for Maunakea Stewardship (CMS) manages the MKSR according to the terms of the Board of Land and Natural Resources' (BLNR) approved Comprehensive Management Plan (CMP). One component of the CMP is the Decommissioning Plan for the Mauna Kea Observatories (DP). Caltech is now proposing to decommission the CSO, per the terms of its Site Decommissioning Plan (SDP) for the Caltech Submillimeter Observatory. The applicant proposes complete removal of all improvements on the CSO site and full restoration of the site, to the greatest extent possible.

Caltech tendered its Notice of Intent (NOI) to decommission the CSO to the University of Hawai'i's OMKM/CMS on November 8, 2015. CSO decommissioning would be conducted according to the methodology described in the SDP and summarized as follows:

1. Removal of all aboveground and underground CSO components within the CSO Site including, but not limited to, the observatory, outbuilding, foundations, cesspool, utilities, and grounding grid;
2. CSO site restoration to 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) place fine ash and small rocks, screened from the existing fill material, onto the site;
3. Caltech would provide funds for UH to support future decommissioning of infrastructure whose use is shared by other Mauna Kea astronomical facilities and which cannot be removed until all uses that they serve have been decommissioned; and
4. Caltech would fund site restoration effectiveness monitoring of the former CSO site for a period of three years.

As originally constructed, the CSO facilities were primarily built on or in fill from other locations on Mauna Kea. The original fill placed for the CSO will be removed and transported to an approved alternative location in the "Batch Plant" area. Project staging will be portioned into three areas: (1) staging area 1 on the CSO site; (2) staging area 2 within the Batch Plant, which will be roughly 110 by 120 feet and roughly 0.3 acres; and (3) the 135 by 100 foot, roughly 0.3 acre, CSO fill stockpiling area also within the Batch Plant. **(SEE EXHIBIT 6)**

The preliminary schedule for the CSO deconstruction and removal is to start the summer of 2022 and to complete the fall of 2022. The preliminary schedule for the CSO site restoration is to start the fall of 2022 and to complete the winter of 2022. The proposed schedule for restoration

monitoring is to start 2023 and to complete 2025. Upon completion of the removal, restoration, and funding elements, Caltech would surrender its sublease to UH.

OTHER ALTERNATIVES CONSIDERED:

*Alternative 1: **No Action.*** Nothing would change from the existing state of the site. No effort would be made to remove the improvements and infrastructure and no effort would be made to restore any part of the site. The No Action alternative does not address the purpose and need for the CSO Decommissioning Project.

*Alternative 2: **Complete Facility and Infrastructure Removal with Full Restoration.*** This is Caltech's preferred alternative and proposed action. Under this alternative, Caltech would commit to the following: (1) complete removal of the CSO observatory, outbuilding, and all other above and underground facilities; (2) full site restoration to pre-construction conditions to the greatest extent practicable, including: removal of construction fill except where needed to fill cavities in the lava substrate caused by infrastructure removal and restoration of arthropod habitat; (3) restoration monitoring to characterize success or failure of physical, biological, and cultural restoration efforts; and (4) provide funds to UH to support the planned, future decommissioning of shared infrastructure.

*Alternative 3: **Complete Facility and Infrastructure Removal with Moderate Restoration.*** This alternative addresses a potential circumstance under which Caltech embarks with the intent to implement Alternative 2 but, due to unanticipated factors, determines that complete removal and full site restoration is not possible.

*Alternative 4: **Facility Removal, Infrastructure Capping, and Moderate Restoration.*** Similar to Alternative 3, this alternative addresses a potential circumstance under which Caltech embarks with the intent to implement Alternative 2 but, due to unanticipated factors, determines that complete removal and full site restoration is not possible.

SUMMARY OF COMMENTS

The Office of Conservation and Coastal Lands referred the application to the following agencies and organizations for review and comment:

State Agencies:

DLNR, Division of Conservation and Resource Enforcement
DLNR, Engineering Division
DLNR, Division of Forestry and Wildlife
DLNR, Hawai'i District Land Office
DLNR, Na Ala Hele
DLNR, Office of Hawaiian Affairs

County Agencies:

County of Hawai'i, Department of Planning
County of Hawai'i, Fire Department
County of Hawai'i, Public Works Department

Federal Agencies:
U.S. Fish and Wildlife

In addition, this application was also sent to the nearest public libraries, the Kailua-Kona and Hilo libraries, to make this information readily available to those who may wish to review it. Additionally, the application was sent to the Hawai‘i State Library Document Center.

Comments were received by the following agencies and individuals and summarized by Staff as follows:

THE STATE

DEPARTMENT OF LAND AND NATURAL RESOURCES

Division of Conservation and Resource Enforcement:

Comments: No Response.

Engineering Division:

Comments: No Response.

Division of Forestry and Wildlife:

Comments: Avoid any outdoor nighttime lighting during the seabird fledging season from September 15 through December 15. ‘Ope‘ope‘a may potentially occur in the vicinity of the project area: avoid the use of barded wire. Consult with the Big Island Invasive Species Committee in terms of planning, design, and operation of the project to learn of any high-risk invasive species in the area and ways to mitigate the spread.

Applicant’s Response: Caltech added to Sections 4.3.4 and 4.14 the fact that the project will not involve night work and if exterior lights were installed, they would be fully shielded and equipped with motion sensor switches and controls. The fact that construction fencing will be free of barbed wire was added in Section 2.1.2.2. The project will comply with the Mauna Kea Invasive Species Plan (ISMP) and other applicable provisions of the CMP and will implement invasive species prevention protocols that will reduce the likelihood of invasive species being introduced and control them if found.

Hawai‘i District Land Office:

Comments: No Comments.

Nā Ala Hele:

Comments: No Response.

Office of Hawaiian Affairs:

Comments: No Response.

COUNTY OF HAWAI'I

COUNTY OF HAWAI'I PLANNING DEPARTMENT

Comments: No Response.

COUNTY OF HAWAI'I FIRE DEPARTMENT

Comments: No Comments.

COUNTY OF HAWAI'I POLICE DEPARTMENT

Comments: They have no concerns as it relates to traffic and public safety on this project.

Applicant's Response: Thank you for your letter and Caltech appreciates the staff time spent reviewing the DEA and preparing the letter.

COUNTY OF HAWAI'I, PUBLIC WORKS

Comments: All development generated runoff shall be disposed of on-site and shall not be directed toward adjacent properties. A drainage system study shall be prepared by a licensed civil engineer and the recommended drainage system shall be constructed meeting the approval of the Department of Public Works; all earthwork and grading activity shall conform to Chapter 10, Erosion and Sedimentary Control, of the Hawai'i County Code; and the subject parcel is in an area designated as Flood Zone D on the FIRM by the FEMA.

Applicant's Response: No development of any kind will occur as part of this project; therefore, no drainage system of any kind will be built as part of this project. All earthwork/grading activities will conform to all applicable provisions of the Hawai'i County Code, including Chapter 10, *Erosion and Sedimentary Control*. Section 4.11.1.3 of the FEA has been updated to reflect Flood Zone D.

FEDERAL

U.S. FISH AND WILDLIFE SERVICES

Comments: **SEE EXHIBIT 7**

Applicant's Response: Thank you for providing the information and recommendations regarding protected species that may occur in the immediate vicinity of the project area.

COMMENTS FROM THE PUBLIC/ORGANISATIONS

Susan Rosier: Traffic assessment does not take into the total number of water trucks that would be required to comply with the Clean Water Act (CWA); traffic assessment does not address the traffic if the decommissioning and the Thirty Meter Telescope were done at the same time. Safety concerns regarding need for two truck brake failure runaway ramps. Best management practices (BMPs) will need to include dust control practices as required by the EPA. Susan suggests the

NPDES Permit application that addresses required CWA sections regarding dust control be included in the EA.

Applicant's response: Environmental Assessment Section 4.8 is based on the information and analysis provided by the *Transportation Management Plan (TMP) for California Institute of Technology Submillimeter Observatory Decommissioning* (Appendix F of the EA). The TMP study determined a total of 14 water round trips total over the course of the project. The CSO decommissioning is scheduled to commence in the summer of 2022 and be completed by the end of 2022. Recently the TIO project announced that project construction is at least two years from commencing.

The NPDES permit will address non-stormwater sources, including water applied to control dust. Dust control is specified in Sections 2.1.2.1.2, 2.1.2.2, 4.10.2, and 5.3.2 and associated impacts are disclosed in the EA. Caltech would work with the Decommission Manager to adapt its dust control BMPs, if planned measures are found to be inadequate.

Hanalei Fergerstrom: Since decommissioning is a new process, it is extremely important that decommissioning be approached comprehensively with extreme care and with as much input as possible. The appendices lodged at the library were only in CD format; I believe the law requires hard copies be made available to the public.

Applicant's Response: Caltech has since sent (on or before October 5, 2021) a printed copy of the DEA, all DEA appendices, and the Conservation District Use Application (CDUA) to the Hawai'i Documents Center, Hilo Regional Library, and Kona Regional Library. Caltech determined it would accept comments on the DEA through November 4, 2021.

KAHEA, The Hawaiian-Environmental Alliance: Decommissioning has a "significant impact" because it paves the way for more observatory construction. The DEA relies on outdated information from the TMT environmental review. The cesspool should be completely removed and refilled to avoid significant environmental impact.

Applicant's Response: The CSO Decommissioning Project is not linked to the TMT Project in any way. The decommissioning will proceed whether the TMT project proceeds or not. Caltech's original announcement (April 2009) planned to decommission the CSO clearly stated that the decision was due to the construction of the next generation Cornell Caltech Atacama Telescope. Caltech's reasoning has not changed.

The DEA relied on the Environmental Impact Statement for the TMT Project because that document (i) remains the foremost source for comprehensive and accurate information about that project and its potential impacts, and (ii) is the most recent environmental disclosure document to assess the cumulative impact associated with past, present, and foreseeable actions within the MKSR. Furthermore, although the EIS prepared for the TMT project was prepared more than a decade ago, conditions within the MKSR has not substantially change since that document was prepared. Additionally, the DEA incorporated new consultation with native Hawaiian community members and cultural practitioners, contained in the Cultural Impact Assessment (CIA) for this project.

Regarding the cesspool, Caltech concurs that removal of the cesspool and restoration of the site is a critical aspect of the CSO Decommissioning Project. All work will be conducted as described in Section 2.1.2.12 of the EA.

Katherine Rosequo: Is encouraged by the removal of the CSO telescope on Mauna Kea.

Applicant's response: Caltech is grateful for your expression of support.

Veronica Ohara: Supports the decommissioning of the CSO telescope.

Applicant's response: Caltech is grateful for your expression of support.

Additionally, Caltech notified parties via U.S. mail or email of the DEA/AFONSI availability. Table 7.2 of the FEA lists all notified parties.

ANALYSIS

Following review and acceptance for processing, the Applicant was notified by correspondence dated August 16, 2021 that:

After reviewing the application, the department finds that:

1. The decommissioning plan for CSO appears to be consistent with the Decommissioning Subplan of the Mauna Kea Comprehensive Management Plan, and will require a Conservation District Use Permit approved by the Board of Land and Natural Resources;
2. Pursuant to HAR, §13-5-40 (a) *Public hearings shall be held (4) on all applications determined by the chairperson that the scope of proposed use, or the public interest requires a public hearing on the application;*
3. In conformance with Hawaii Revised Statutes (HRS), 343, as amended, and HAR, 11-200.1, a Finding of No Significant Impact to the environment (FONSI) is anticipated for the proposed project

The Final EA/Finding of No Significant Impact (FONSI) was issued by the DLNR Chairperson and published in the December 8, 2021, edition of the Environmental Review Program's *The Environmental Notice*. A public hearing notice was advertised in the State and local newspaper on September 23, 2021, and the public hearing was conducted via Zoom October 13, 2021; three members of the public attended.

CONSERVATION CRITERIA

The following discussion evaluates the merits of the proposed land use by applying the criteria established in §13-5-30, HAR.

- 1) *The proposed use is consistent with the purpose of the Conservation District.*

The objective of the Conservation District is to conserve, protect, and preserve the important natural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety, and welfare. This project proposes to completely remove all structures (above and below the ground) as well as restore the site to its pre-construction condition, as closely as possible.

Appropriate management is outlined within the Mauna Kea Science Reserve (MKSr) Board approved Comprehensive Management Plan (CMP). Pursuant to the Decommissioning Plan (DP), a subplan of the CMP, the 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 DP provides the observatory decommissioning framework on Mauna Kea. The applicant's DP appears to be consistent with the Decommissioning Subplan of the CMP.

- 2) *The proposed land use is consistent with the objectives of the Subzone of the land on which the use will occur.*

The land is in the Resource Subzone. The objective of this subzone is to ensure, with proper management, the sustainable use of the natural resources of those areas. The proposed project is an identified land use within the subzone: P-8 STRUCTURES AND LAND USES, EXISTING (B-1) *Demolition, removal, or minor alteration of existing structures, facilities, land, and equipment*. While an identified land use with "B" is a site plan approval, a letter to the OMKM (now CMS) dated February 19, 2016, stated that the decommissioning of the CSO would require a CDUA to be reviewed and approved, subject to conditions, by the BLNR and an EA. **(SEE EXHIBIT 7)**

Caltech is now proposing to decommission the CSO, per the terms of its Site Decommissioning Plan (SDP). A component of its SDP is for the Board of Land and Natural Resources review and issuance of a Conservation District Use Permit (CDUP).

- 3) *The proposed land use complies with the provisions and guidelines contained in Chapter 205A, HRS entitled "Coastal Zone Management", where applicable.*

The objectives, policies, and guidelines of the Coastal Zone Management (CZM) program contained in Chapter 205A, Hawai'i Revised Statutes (HRS), are focused on the preservation, protection, and where possible, the restoration of the natural resources of the coastal zone in Hawai'i. The proposed land use is outside the Special Management Area (SMA) and is thus not subject to County SMA rules.

All work will be conducted entirely within the MKSR at an elevation of roughly 13,350 feet above sea level. Caltech has instituted a series of mitigation measures, such as erosion and water quality measures, to ensure that the project's potential adverse environmental impacts are minimized. Consistent with the CZM program, the public has had an

opportunity to review the DEA prepared in support of this application and provide comments.

- 4) *The proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region.*

The proposed decommissioning is limited to the removal of existing structures and restoration of the site to its pre-construction condition, as closely as possible. The proposed project will not cause any substantial or significant adverse impacts to the site's existing natural resources or within the surrounding area. The proposed project is expected to benefit the natural environment through habitat restoration and the area's recolonization by native flora and fauna.

- 5) *The proposed land use, including buildings, structures and facilities, shall be compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels.*

The proposed land use does not include the development of any buildings, structures, or facilities. This project will, to the maximum extent practicable, remove all structures, and restore the CSO site, as closely as possible, to its pre-construction condition. In doing so, the site will be restored to a natural appearance, consistent with the locality and surrounding areas, and appropriate to the physical conditions of the Mauna Kea summit region.

- 6) *The existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon, whichever is applicable.*

The proposed project will, to the maximum extent practicable, remove all structures and restore the site, as closely as possible, to its pre-construction condition. Once restored, the site should be relatively indistinguishable from other unoccupied adjacent areas and with a much more natural appearance than currently.

- 7) *Subdivision of land will not be utilized to increase the intensity of land uses in the Conservation District.*

No subdivision of land is proposed for this project.

- 8) *The proposed land use will not be materially detrimental to the public health, safety and welfare.*

The proposed action will return the site to its pre-construction environment, to the greatest extent practicable. The act of returning the site to its former state means the restoration of uneven topography, which will render the site less safe for traversing. However, it will not be materially detrimental to public health, safety, or welfare because the site condition will be consistent with the surrounding undisturbed areas and currently the site is not known to be visited by the public for cultural, recreational, or other purposes.

CULTURAL IMPACT ANALYSIS:

ASM Affiliates prepared a CIA for the CSO Decommissioning Project. The CSO site is located within the boundary of the Mauna Kea Summit Region Historic District (SIHP Site 26869). The CSO project area is just outside the boundary of the Traditional Cultural Property (TCP) known as Kūkahau‘ula (SIHP Site 21438) (see **EXHIBIT 9**).

Through archival research and a compilation of native traditions, historical accounts, and oral-historical interviews, a detailed cultural history of Mauna Kea documents a wide range of cultural knowledge and practice associated with the mountain. These studies have recognized Mauna Kea as a “cultural landscape” that continues to be sacred to contemporary cultural practitioners. Numerous studies also indicate that Native Hawaiians performed what would today be considered industrial activities on the upper slopes of Mauna Kea, as evidenced by the Mauna Kea Adze Quarry Complex. Fine-grained basalt obtained within the quarry were used by craftspeople to make adze, octopus lure sinkers, and other items.

Mauna Kea’s compiled oral-historical information provides details about the cultural importance of the summit’s view planes, the traditional significance of individual pu‘u, and the importance of proper protocol. It is also clear from the oral-historical information that current-day Hawaiian cultural activities on Mauna Kea are perceived by the practitioners of those activities to be an exercise in, and extension of traditional and customary practices.

The CIA did not identify any practices that are exercised on the CSO site, but there are a wide variety of practices, beliefs, and resources associated with Mauna Kea’s summit region. The CIA’s conclusion is that the proposed project, in particular its goal of restoring the site to the maximum practicable extent, would have a beneficial effect on Native Hawaiian practices.

DISCUSSION

The project’s purpose is to enable Caltech to conclude its use of the site and surrender its sublease. Caltech has stated its intent to completely remove all structures on the CSO site and fully restore it, to the greatest extent practicable. The CSO decommissioning would be conducted according to the methodology described in the SDP. The methodology includes removal of all aboveground and underground CSO components within the site including, but not limited to, the observatory, outbuilding, foundations, cesspool, utilities, and grounding grid. A site restoration to include (1) removing fill placed on the lava flow during construction; (2) filling cavities where excavation occurred (e.g. cesspool) with a portion of the fill placed on the lava flow during CSO construction; (3) placing fine ash and small rocks that had been screened from the fill material. Fill removal and cavity filling would return the topography to its pre-construction condition, to the greatest extent possible. Fine ash/small rock placement would leave a visual appearance consistent with the original condition and would restore habitat for native arthropod fauna, to the greatest extent possible. Additionally, Caltech would fund site restoration effectiveness monitoring for a period of three years. Caltech would also provide funds to UH to support future decommissioning of infrastructures whose use is shared by other Mauna Kea facilities and currently cannot be removed.

Best management practices (BMPs)

Appendix I of the Final Environmental Assessment outlines the proposed BMPs for this project. They include but are not limited to:

- An independent construction monitor who has oversight and authority to ensure that all aspects of ground-based work comply with protocols and permit requirements;
- Require Construction Practices BMPs. This will include measures to comply with applicable aspects of the CMP and other guidance, including:
 - Worker orientation regarding historic, cultural, ecological, and natural resources;
 - Invasive species monitoring;
 - Safety and accident prevention;
 - Materials storage and waste management;
 - Erosion and water quality measures;
 - Dust and debris management; and
 - Coordination with/reporting to CMS;
- Develop a rock movement plan;
- Require contractors to provide information from construction activities to the Center for Mauna Kea Stewardship;
- Require on-site monitoring (archaeological, cultural, and biological monitors) during deconstruction; and
- Conduct required archaeological monitoring during construction projects per SHPD-approved plan.

All removed material will be designated as deconstruction waste material and will be removed from the CSO site and transported to an approved landfill or a designated recycling center. For the existing cesspool, all sludge remnants will be pumped out and tested for potential contaminants. The cesspool will be trenched around its outer concrete perimeter to its depth and removed. Structural fill from the CSO site will be used to fill the void left once the cesspool's concrete structure is removed.

It is believed a small hydraulic fluid leak occurred during site construction as well as a reported leak in 2009. Following removal of the underground concrete slab and cesspool, Caltech will perform sampling and analysis per the Phase II Sample Analysis Plan (SAP). Contaminated soil, if any, would be removed and disposed of properly based on the results of sampling outlined in the Phase II SAP.

As the fill is removed, a quantity of roughly five cubic yards of fine ash material and small rocks, consistent with the size and material of the rocks scattered in the nearby undisturbed areas will be segregated using a screen or similar method and stockpiled on site or at the staging area until needed for restoring the arthropod habitat. No fill or aggregate material will be imported from a non-Mauna Kea source to the CSO Site or Staging Area 2. Once all the excess fill material has been removed, the reserved fine ash and small rocks will be layered on top of summit-native rock to leave a visual appearance consistent with the original site condition.

Based on the information provided, staff believes that the project will have negligible adverse environmental or ecological effects provided that best management practices and mitigation measures as described in the application and environmental assessment and as required by rule or laws are fully implemented.

RECOMMENDATION

Based on the preceding analysis, staff recommends that the Board of Land and Natural Resources APPROVE Conservation District Use Application HA-3880 for the Caltech Submillimeter Observatory (CSO) Decommissioning Project located at Ka'ōhe, Hāmākua, Hawai'i, TMK (3) 4-4-015:009 (por) subject to the following conditions:

1. The permittee shall comply with all applicable statutes, ordinances, rules, and regulations of the federal, state, and county governments, and applicable parts of this chapter;
2. The permittee, its successors and assigns, shall indemnify and hold the State of Hawai'i harmless from and against any loss, liability, claim, or demand for property damage, personal injury, and death arising out of any act or omission of the applicant, its successors, assigns, officers, employees, contractors, and agents under this permit or relating to or connected with the granting of this permit;
3. The permittee shall comply with all applicable Department of Health administrative rules;
4. Unless otherwise authorized, any work or construction to be done on the land shall be initiated within one year of the approval of such use, in accordance with construction plans that have been signed by the chairperson and shall be completed within three years of the approval of such use. The permittee shall notify the department in writing when construction activity is initiated and when it is completed;
5. Prior to the start of construction activities, the applicant shall forward to the SHPD, for review and acceptance, the archaeological monitoring plan (AMP);
6. The permittee shall provide the OCCL a yearly site restoration monitoring report for the three (3) years of restoration monitoring;
7. All representations relative to mitigation and Best Management Practices set forth in the accepted application and environmental assessment or impact statement for the proposed use are incorporated as conditions of the permit;
8. The permittee shall plan to minimize the amount of dust generating materials and activities. Material transfer points and on-site vehicular traffic routes shall be centralized. Dusty equipment shall be located in areas of least impact. Dust control measures shall be provided during weekends, after hours and prior to daily start-up of

- project activities. Dust from debris being hauled away from the project site shall be controlled;
9. The permittee shall notify the Office of Conservation and Coastal Lands (OCCL) in writing prior to the initiation and upon completion of the project;
 10. Should historic remains such as artifacts, burials or concentration of charcoal be encountered during construction activities, work shall cease immediately in the vicinity of the find, and the find shall be protected from further damage. The contractor shall immediately contact SHPD (808-692-8015), which will assess the significance of the find and recommend an appropriate mitigation measure, if necessary;
 11. The permittee shall utilize Best Management Practices for the proposed project;
 12. The permittee understands and agrees that the permit does not convey any vested right(s) or exclusive privilege;
 13. In issuing the permit, the department and board have relied on the information and data that the permittee has provided in connection with the permit application. If, subsequent to the issuance of the permit such information and data prove to be false, incomplete, or inaccurate, this permit may be modified, suspended, or revoked, in whole or in part, and the department may, in addition, institute appropriate legal proceedings;
 14. Where any interference, nuisance, or harm may be caused, or hazard established by the use, the permittee shall be required to take measures to minimize or eliminate the interference, nuisance, harm, or hazard;
 15. Obstruction of public roads, trails, and pathways shall be avoided or minimized. If obstruction is unavoidable, the permittee shall provide alternative roads, trails, or pathways acceptable to the department;
 16. During construction, appropriate mitigation measures shall be implemented to minimize impacts to off-site roadways, utilities, and public facilities;
 17. The permittee shall obtain a county building or grading permit or both for the use prior to final construction plan approval by the department;
 18. Artificial light from exterior lighting fixtures, including but not limited to floodlights, uplights, or spotlights used for decorative or aesthetic purposes, shall be prohibited if the light directly illuminates or is directed to project across property boundaries toward the shoreline and ocean waters, except as may be permitted pursuant to section 205A-71, HRS. All exterior lighting shall be shielded to protect the night sky;
 19. The permittee shall avoid nighttime construction during the seabird fledging period of September 15 through December 15;

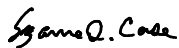
20. The permittee shall not use barbed wire for fencing;
21. The permittee shall ensure that all project vehicles, machinery, and equipment shall be cleaned, inspected by its user, and found free of mud, dirt, debris, and invasive species;
22. The permittee acknowledges that the approved work shall not hamper, impede, or otherwise limit the exercise of traditional, customary, or religious practices of native Hawaiians in the immediate area, to the extent the practices are provided for by the Constitution of the State of Hawai'i, and by Hawai'i statutory and case law;
23. Other terms and conditions as may be prescribed by the Chairperson; and
24. Failure to comply with any of these conditions shall render this Conservation District Use Permit void under Chapter 13-5, as determined by the chairperson or board.

Respectfully submitted,



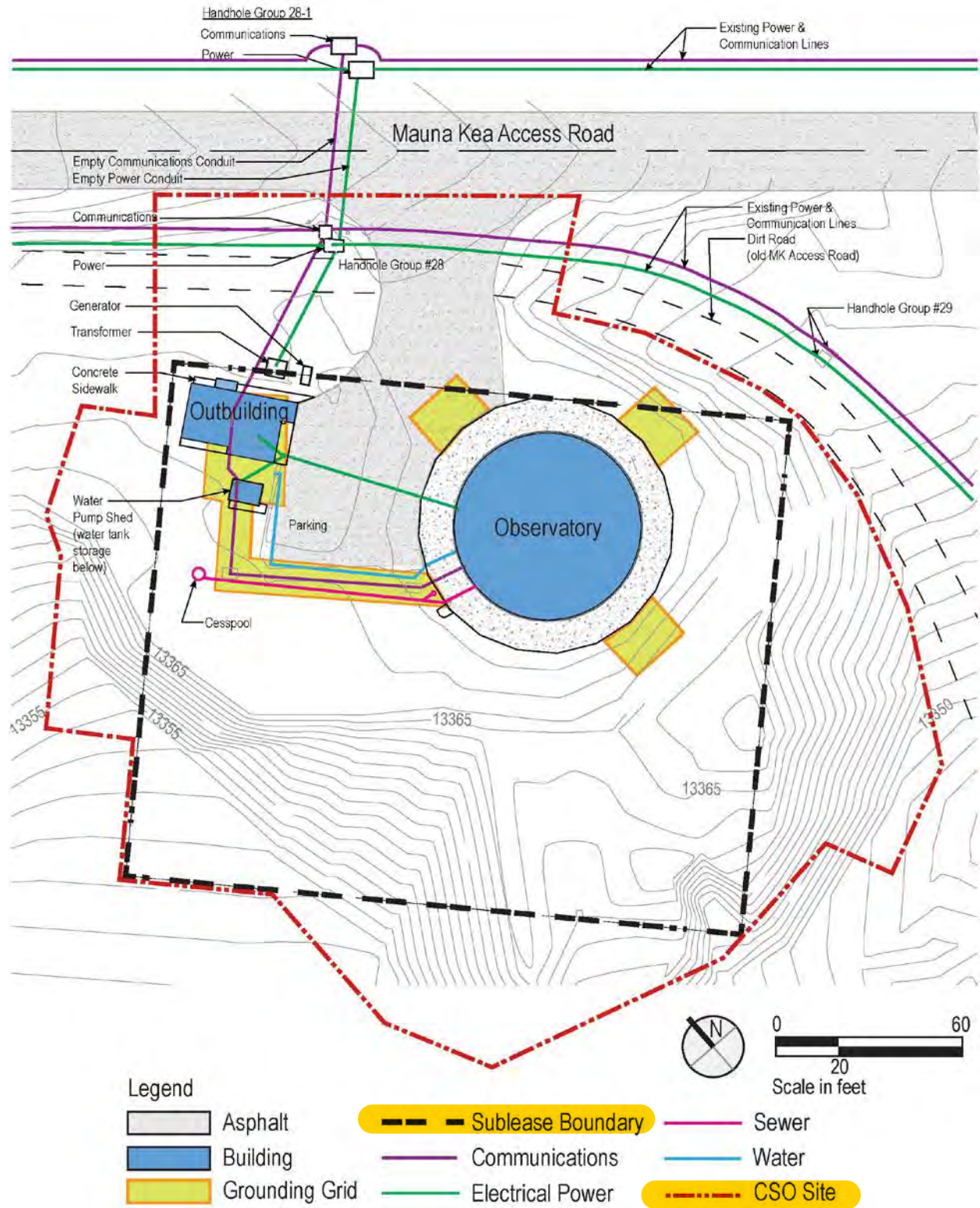
Rachel Beasley, Staff Planner
Office of Conservation and Coastal Lands *MC*

Approved for submittal:



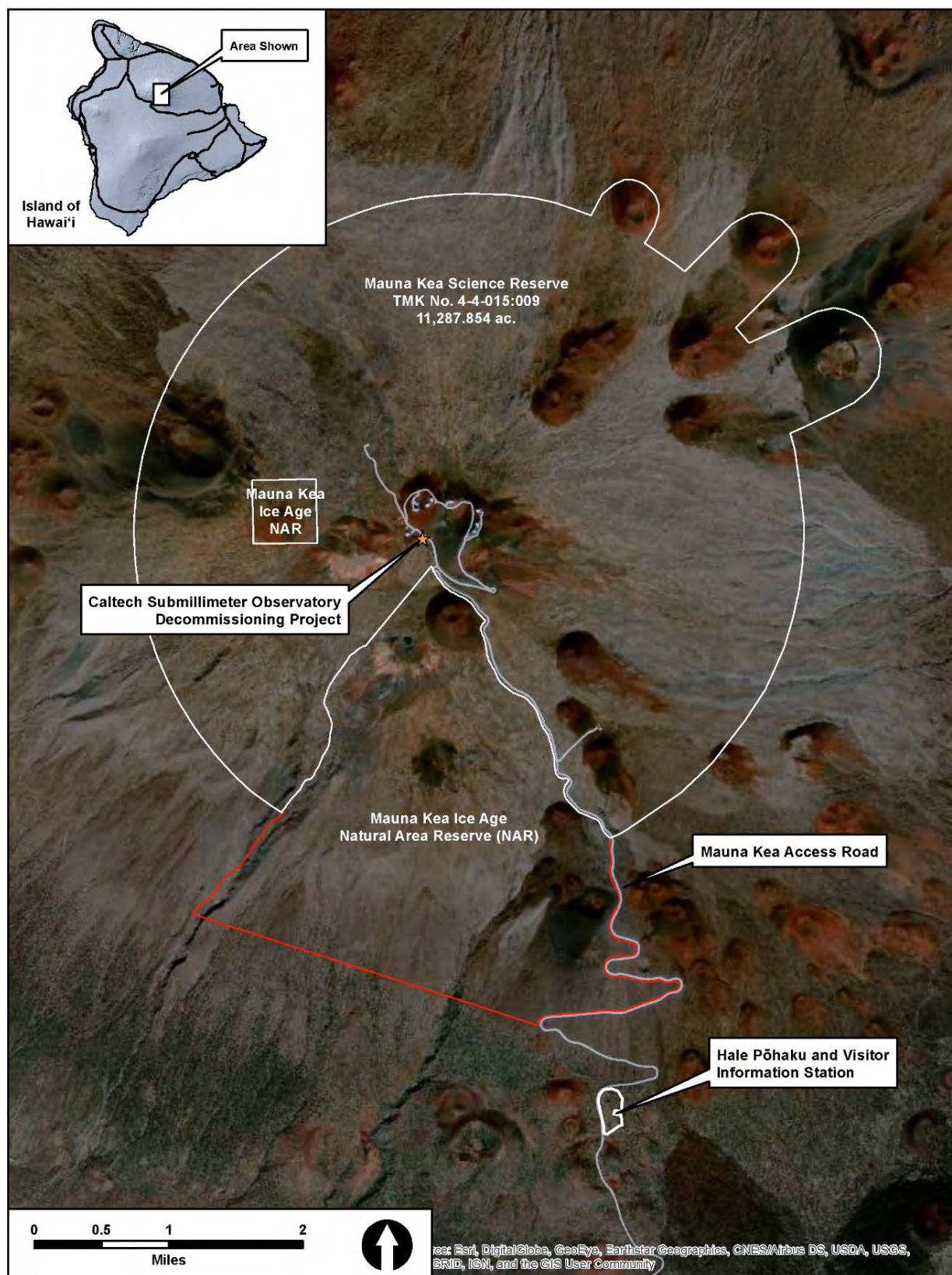
SUZANNE D. CASE., Chairperson
Board of Land and Natural Resources

Figure 1.2 Extent of CSO Site and Existing Layout



Source: M3 Engineering and Technology (2020)

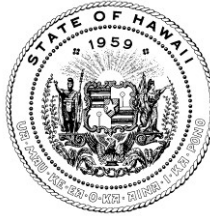
Figure 1.1 Location of CSO in MKSR



Source: Planning Solutions, Inc. (2020)

Table 4.2 Historic Sites within the Visual Effects Study Area

<i>Site No.</i>	<i>Type(s)</i>	<i>No. of Features</i>	<i>Type of Features</i>	<i>Location Relative to CSO</i>
16164	Shrine	2	5, possibly 6, uprights	188 meters (m) SSW
16165	Shrine	1	2 uprights	250 m SSW
21438	Kūkahau‘ula	1	Maunakea Summit as TCP	149 m E
21440	Pu‘u Waiau	1	Pu‘u as 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 Shrine, Marker/Memorial	17	1 terrace, 1 mound/terrace, 4 pavements, 9 mounds, 2 rock piles	1,530 m S
26142	Workshop	1	Lithic scatter	1,510 m S
27579	USGS Marker	1	1 USGS marker	630 m W
27585	Workshop	1	4 adze manufacturing workshops, flakes, hammerstones, cores	2,530 m SW
28623	Possible Burial	4	4 mounds	930 m SE
Source: ASM, Cultural Impact Assessment 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 (2020)				



STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
KAKUHIHEWA BUILDING
601 KAMOKILA BLVD., STE 555
KAPOLEI, HI 96707

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'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 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'ohe 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'uhau'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

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

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 to of the report to Lehua.K.Souares@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.

Sam Lemmo
October 29, 2021
Page 4

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
Jim Hayes, jim@psi-hi.com
Makena White, makena@psi-hi.com
Ben Barna, bbarna@asmaffiliates.com

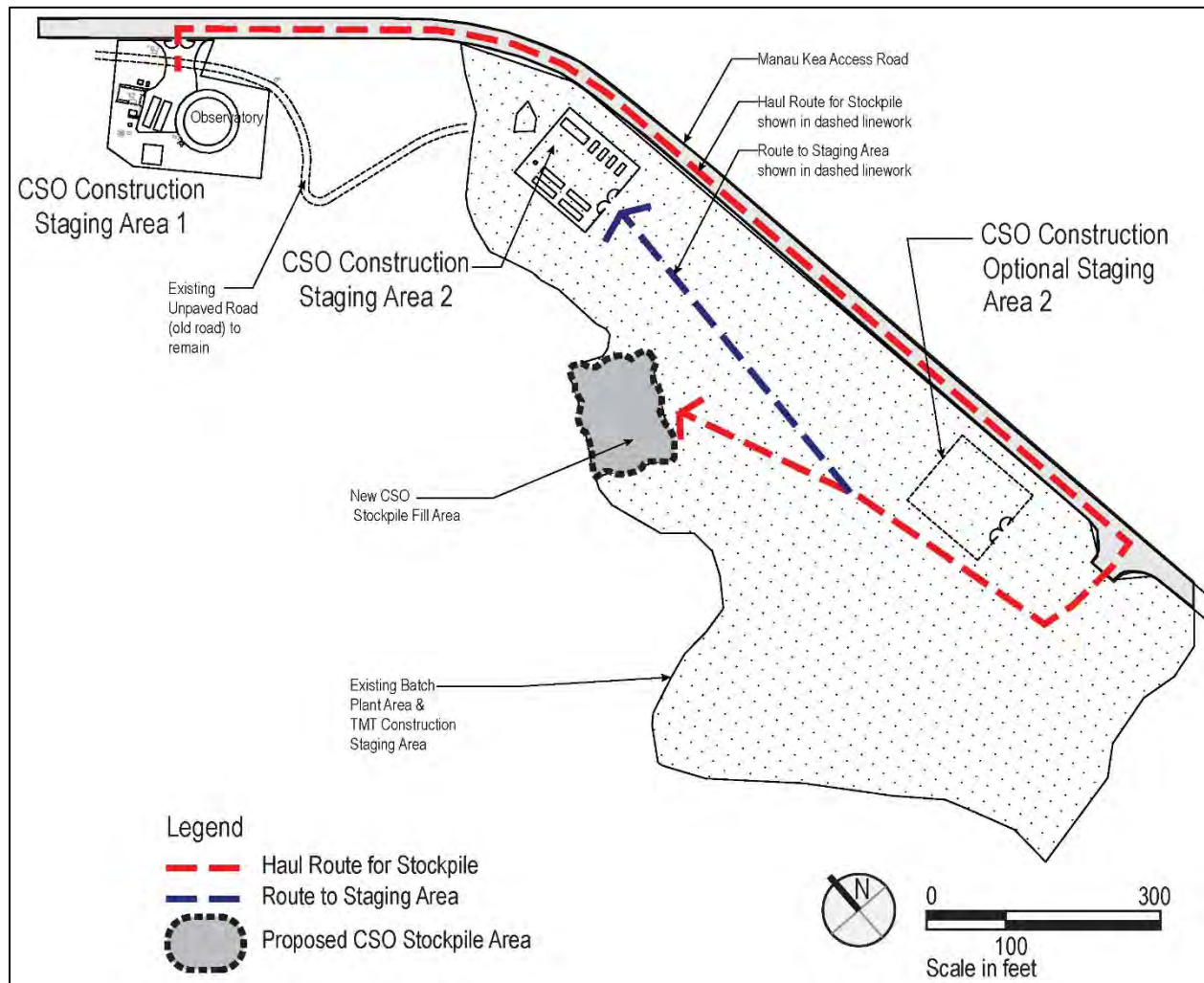
Figure 4.1 CSO Decommissioning Project Direct Effect Study Area



Note: Location of the CSO Decommissioning Project's direct effect study area is shown in yellow.

Source: ASM, *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 (2018)

Figure 2.3 Conceptual Plan View of Overall Deconstruction Staging



Source: M3 Engineering and Technology (2020)



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122
Honolulu, Hawai'i 96850



In Reply Refer To:
01EPIF00-2022-TA-0005

October 6, 2021

Planning Solutions, Inc.
Attention: Mākena White, AICP
711 Kapi'olani Boulevard, Suite 950
Honolulu, Hawai'i 96813

Subject: Comments on the Draft Environmental Assessment for Caltech Submillimeter Observatory Decommissioning Project, Mauna Kea, Island and County of Hawai'i

Dear Mākena White:

The U.S. Fish and Wildlife Service (Service) received your correspondence on September 8, 2021 requesting for comment on the Draft Environmental Assessment (DEA) and Anticipated Findings of No Significant Impact (AFONSI) for the Caltech Submillimeter Observatory (CSO) Decommissioning Project on Mauna Kea on the island of Hawai'i. We offer the following comments to assist you in your planning process so that impacts to trust resources can be avoided through site preparation, construction, and operation. Our comments are prepared under the authority of, and in accordance with, provisions of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq.*), as amended (ESA).

Project Description

The CSO facility is located within approximately 1.3 acres of TMK: (3) 4-4-015:009, which is located in the Resource Subzone of the State Land Use Conservation District. The site is accessed via the Mauna Kea Access Road off of the Daniel K. Inouye Highway, State Route 200, locally known as Saddle Road. 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 the University of Hawai'i (UH) and the State of Hawai'i. Caltech tendered its Notice of Intent to decommission the CSO on November 18, 2015. The CSO decommissioning project consists of the following activities:

INTERIOR REGION 9
COLUMBIA-PACIFIC NORTHWEST

IDAHO, MONTANA*, OREGON*, WASHINGTON
*PARTIAL

INTERIOR REGION 12
PACIFIC ISLANDS

AMERICAN SAMOA, GUAM, HAWAI'I, NORTHERN
MARIANA ISLANDS

- Removing all aboveground and underground CSO components within the CSO site including but not limited to, the observatory, outbuilding, foundations, cesspool, utilities, and grounding grid.
- Restoring the CSO site so that the topography is returned to its pre-construction condition to the greatest extent possible. This would be achieved by removing fill placed on the lava flow during construction and filling cavities in the lava flow where excavation occurred using fill that was placed on the lava flow during the construction of the CSO.
- Caltech will provide funding to UH to support future decommissioning of shared infrastructure by other Mauna Kea observatories and other uses. Such infrastructure cannot be removed until all uses that it serves have been decommissioned.
- Caltech will provide funding for site restoration effectiveness monitoring of the former CSO site for a period of three years.

We have reviewed the information you provided, and pertinent information in our files, including data compiled by the Hawai'i Biodiversity and Mapping Project as it pertains to federally listed species and designated critical habitat. Our data indicate there is one listed animal in the immediate vicinity of the project area: the federally endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*). There is one endangered plant species in the immediate vicinity of the project area: the Mauna Kea Silversword (*Argyroxiphium sandwicense* subsp. *sandwicense*). Additionally, the endangered Hawaiian petrel (*Pterodroma sandwichensis*), the Hawai'i distinct population segment of the band-rumped storm-petrel (*Oceanodroma castro*), and the threatened Newell's shearwater (*Puffinus auricularis newelli*) may transit the project area flying to upland breeding colonies.

Hawaiian hoary bat: The Hawaiian hoary bat roosts in both exotic and native woody vegetation across all islands and will leave young unattended in trees and shrubs when they forage. If trees or shrubs 15 feet (ft) or taller are cleared during the pupping season, June 1 through September 15, there is a risk that young bats could inadvertently be harmed or killed, since they are too young to fly or may not move away. Additionally, Hawaiian hoary bats forage for insects from as low as 3 ft to higher than 500 ft above the ground and can become entangled in barbed wire used for fencing.

To avoid and minimize impacts to the endangered Hawaiian hoary bat we recommend you incorporate the following applicable measures into your project description:

- Do not disturb, remove, or trim woody plants greater than 15 ft tall during the bat birthing and pup-rearing season (June 1 through September 15).
- Do not use barbed wire for fencing.

Mauna Kea Silversword: Project activities may affect listed plant species by causing physical damage to plant parts (roots, stems, flowers, fruits, seeds, etc.) as well as impacts to other life requisite features of their habitat which may result in reduction of germination, growth and/or reproduction. Cutting and removal of vegetation surrounding listed plants has the potential to alter microsite conditions (e.g., light, moisture, temperature), damaging or destroying the listed plants and also increasing the risk of invasion by nonnative plants which can result in higher incidence or intensity of fire. Activities such as grazing, use of construction equipment and vehicles, and increased human traffic (i.e., trails, visitation, monitoring), can cause ground

disturbance, erosion, and/or soil compaction which decrease absorption of water and nutrients and damage plant root systems and may result in reduced growth and/or mortality of listed plants. Soil disturbance or removal has the potential to negatively impact the soil seed bank of listed plant species if such species are present or historically occurred in the project area.

In order to avoid or minimize potential adverse effects to listed plants that may occur on the proposed project site, we recommend minimizing disturbance outside of existing developed or otherwise modified areas. When disturbance outside existing developed or modified sites is proposed, conduct a botanical survey for listed plant species within the project action area, defined as the area where direct and indirect effects are likely to occur. Surveys should be conducted by a knowledgeable botanist with documented experience in identifying native Hawaiian and Pacific Islands plants, including listed plant species. Botanical surveys should optimally be conducted during the wettest part of the year (typically October to April) when plants and identifying features are more likely to be visible, especially in drier areas. If surveys are conducted outside of the wet season, the Service may assume plant presence.

The boundary of the area occupied by listed plants should be marked with flagging by the surveyor. To avoid or minimize potential adverse effects to listed plants, we recommend adherence to buffer distances for the activities in the **Table below**. Where disturbed areas do not need to be maintained as an open area, restore disturbed areas using native plants as appropriate for the location. Whenever possible we recommend using native plants for landscaping purposes. The following websites are good resources to use when choosing landscaping plants: Landscape Industry Council of Hawai‘i Native Plant Poster (<http://hawaiiscape.wpengine.com/publications/>), Native Hawaiian Plants for Landscaping, Conservation, and Reforestation (<https://www.ctahr.hawaii.edu/oc/freepubs/pdf/of-30.pdf>), and Best Native Plants for Landscapes (<https://www.ctahr.hawaii.edu/oc/freepubs/pdf/OF-40.pdf>).

If listed plants occur in a project area, the avoidance buffers are recommended to reduce direct and indirect impacts to listed plants from project activities. However, where project activities will occur within the recommended buffer distances, additional consultation is required. The impacts to the plants of concern within the buffer area may be reduced by placing temporary fencing or other barriers at the boundary of the disturbance, as far from the affected plants as practicable.

The above guidelines apply to areas outside of designated critical habitat. If project activities occur within designated critical habitat unit boundaries, additional consultation is required.

All activities, including site surveys, risk introducing nonnative species into project areas. Specific attention needs to be made to ensure that all equipment, personnel and supplies are properly checked and are free of contamination (weed seeds, organic matter, or other contaminants) before entering project areas. Quarantines and or management activities occurring on specific priority invasive species proximal to project areas need to be considered or adequately addressed. This information can be acquired by contacting local experts such as those on local invasive species committees (island of Hawai‘i: <https://www.biisc.org/>).

Table. Recommended buffer distances to minimize and avoid potential adverse impacts to listed plants from activities listed below.

Action	Buffer Distance (feet [meters]) - Keep Project Activity This Far Away from Listed Plant	
	Grasses/Herbs/Shrubs and Terrestrial Orchids	Trees and Arboreal Orchids
Walking, hiking, surveys	3 ft (1 m)	3 ft (1 m)
Cutting and Removing Vegetation By Hand or Hand Tools (e.g., weeding)	3 ft (1 m)	3 ft (1 m)
Mechanical Removal of Individual Plants or Woody Vegetation (e.g., chainsaw, weed eater)	3 ft up to height of removed vegetation (whichever greater)	3 ft up to height of removed vegetation (whichever greater)
Removal of Vegetation with Heavy Equipment (e.g., bulldozer, tractor, "bush hog")	2x width equipment + height of vegetation	820 ft (250 m)
Ground/Soil Disturbance/Outplanting/Fencing (Hand tools, e.g., shovel, 'ō'ō; Small mechanized tools, e.g., auger)	20 ft (6 m)	2x crown diameter
Ground/Soil Disturbance (Heavy Equipment)	328 ft (100 m)	820 ft (250 m)
Surface Hardening/Soil compaction	Trails (e.g., human, ungulates)	20 ft (6 m)
	Roads/Utility Corridors, Buildings/Structures	328 ft (100 m)
		2x crown diameter
		820 ft (250 m)

Definitions (Wagner et al. 1999)

Crown: The leafy top of a tree.

Herb: A plant, either annual, biennial, or perennial, with the non-woody stems dying back to the ground at the end of the growing season.

Shrub: A perennial woody plant with usually several to numerous primary stems arising from or relatively near the ground.

Tree: A woody perennial that usually has a single trunk

Hawaiian petrel, Newell's shearwater, and Hawai'i distinct population segment of the band-rumped storm-petrel: Hawaiian seabirds may traverse the project area at night during the breeding, nesting, and fledging seasons (March 1 to December 15). Outdoor lighting could result in seabird disorientation, fallout, and injury or mortality. Seabirds are attracted to lights and after circling the lights, they may become exhausted and collide with nearby wires, buildings, or other structures or they may land on the ground. Downed seabirds are subject to increased mortality due to collision with automobiles, starvation, and predation by dogs, cats, and other predators. Young birds (fledglings) traversing the project area between September 15 and December 15, in

their first flights from their mountain nests to the sea, are particularly vulnerable to light attraction.

The Hawaiian petrel has been discovered recently nesting near 10,000 feet elevation on Mauna Kea. Though attraction to lights at higher elevations may be rare, it cannot be ruled out.

To avoid and minimize potential project impacts to seabirds we recommend you incorporate the following applicable measures into your project description:

- Fully shield all outdoor lights so the bulb can only be seen from below.
- Install automatic motion sensor switches and controls on all outdoor lights or turn off lights when human activity is not occurring in the lighted area.
- Avoid nighttime construction during the seabird fledging period, September 15 through December 15.

The project area and analysis does not include the road access to the site, which passes through critical habitat for the endangered palila (*Loxioides bailleui*, U.S. Fish and Wildlife Service [USFWS] 1977). Introduction of invasive species and fire risk are the main threats posed by increases in traffic associated with this project.

Potential sources of ignition related to vehicle traffic include vehicle accidents, improperly disposed cigarettes and matches, and sparks from automobile catalytic converters on unpaved roads. We recommend you follow best management practices as they relate to fire outlined in the Mauna Kea Comprehensive Management Plan (Office of Mauna Kea Management 2021) and associated sub-plans, and educate contractors about fire prevention.

The Service recommends incorporating all applicable avoidance and minimization measures into your project design to avoid and minimize effects on protected species. If you determine the proposed project may affect federally listed species, we recommend you contact our office early in the planning process so that we may assist you with ESA compliance.

Thank you for the opportunity to comment and for participating with us in the protection of our endangered species. If you have any questions, please contact Eldridge Naboa at Eldridge_Naboa@fws.gov or by telephone at 808-284-0037. When referring to this project, please include this reference number: 01EPIF00-2022-TA-0005.

Sincerely,

Acting Island Team Manager
Maui Nui and Hawai‘i Island

Enclosure: Biosecurity Protocol – Hawai‘i Island (July 2018)

LITERATURE CITED

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[USFWS] U.S. Fish and Wildlife Service. 1977. Endangered and threatened wildlife and plants; determination of critical habitat for six endangered species. Federal Register 42: 40685-40690.

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BIOSECURITY PROTOCOL – HAWAI‘I ISLAND (JULY 2018)

The following biosecurity protocol (based on National Park Service, State of Hawai‘i, U.S. Fish and Wildlife, U.S. Geological Survey, and the DOI Office of Native Hawaiian Relations guidance) should be followed when operating on Hawai‘i Island to prevent the introduction of harmful invasive species including frogs, ants, weeds, and fungi into local natural areas (e.g., Hawai‘i Volcanoes National Park, Hakalau Forest National Wildlife Refuge, State of Hawai‘i “Natural Areas”) and areas with native habitat (habitat that is primarily composed of native vegetation), other islands in Hawaiian archipelago, or the U.S. mainland. The protocol also includes suggestions for keeping field staff safe from certain invasive species.

1. All work vehicles, machinery, and equipment should be cleaned, inspected by its user, and found free of mud, dirt, debris and invasive species prior to entry into the natural areas or native habitat.

a. Vehicles, machinery, and equipment must be thoroughly pressure washed in a designated cleaning area and visibly free of mud, dirt, plant debris, insects, frogs (including frog eggs) and other vertebrate species such as rats, mice and non-vegetative debris. A hot water wash is preferred. Areas of particular concern include bumpers, grills, hood compartments, areas under the battery, wheel wells, undercarriage, cabs, and truck beds (truck beds with accumulated material (intentionally placed or fallen from trees) are prime sites for hitchhikers).

b. The interior and exterior of vehicles, machinery, and equipment must be free of rubbish and food. The interiors of vehicles and the cabs of machinery must be vacuumed clean. Floor mats shall be sanitized with a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution.

c. Any machinery, vehicles, equipment, or other supplies found to be infested with ants (or other invasive species) must not enter natural areas or native habitat. Treatment is the responsibility of the equipment or vehicle owner and operator.

2. Little Fire Ants – All work vehicles, machinery, and equipment should be inspected for invasive ants prior to entering the natural areas or native habitat.

a. A visual inspection for little fire ants should be conducted prior to entry into natural areas or native habitat.

b. Hygiene is paramount but even the cleanest vehicle can pick up a little fire ant. Place MaxForce Complete Brand Granular Insect Bait (1.0% Hydramethylnon; <http://littlefireants.com/Maxforce%20Complete.pdf>) into refillable tamper resistant bait stations. An example of a commercially available refillable tamper resistant bait station is the [Ant Café Pro \(https://www.antcafe.com/\)](https://www.antcafe.com/). Place a bait station (or stations) in vehicle. Note larger vehicles, such as trucks, may require multiple stations. Monitor bait stations frequently (every week at a minimum) and replace bait as needed. If the station does not have a sticker to identify the contents, apply a sticker listing contents to the station.

c. Any machinery, vehicles, equipment, or other supplies found to be infested with ants (or other invasive species) must not enter natural areas or native habitat until it is sanitized and re-tested

following a resting period. Infested vehicles must be sanitized following recommendations by the Hawaii Ant Lab (<http://www.littlefireants.com/>) or other ant control expert and in accordance with all State and Federal laws. Treatment is the responsibility of the equipment or vehicle owner.

d. Gravel, building materials, or other equipment such as portable buildings should be baited using MaxForce Complete Brand Granular Insect Bait (1.0% Hydramethylnon; <http://littlefireants.com/Maxforce%20Complete.pdf>) or AmdroPro (0.73% Hydramethylnon; <http://littlefireants.com/Amdro%20Pro.pdf>) following label guidance.

e. Storage areas that hold field tools, especially tents, tarps, and clothing should be baited using MaxForce Complete Brand Granular Insect Bait (1.0% Hydramethylnon; <http://littlefireants.com/Maxforce%20Complete.pdf>) or AmdroPro (0.73% Hydramethylnon; <http://littlefireants.com/Amdro%20Pro.pdf>) following label guidance.

3. Base yards and staging areas inside and outside areas must be kept free of invasive species.

a. Base yards and staging areas should be inspected at least weekly for invasive species and any found invasive removed immediately. Pay particular attention to where vehicles are parked overnight, keeping areas within 10-meters of vehicles free of debris. Parking on pavement and not under trees, while not always practical is best.

b. Project vehicles or equipment stored outside of a base yard or staging area, such as a private residence, should be kept in a pest free area.

4. All cutting tools must be sanitized to prevent the Rapid ‘Ōhi‘a Death (ROD) fungus.

a. Avoid wounding ‘ōhi‘a trees and roots with mowers, chainsaws, weed eaters, and other tools. Cut only the minimum amount of trees and branches as approved for the project.

b. All cutting tools, including machetes, chainsaws, and loppers must be sanitized to remove visible dirt and other contaminants prior to entry into natural areas or areas with native habitat, and when moving to a new project area within the native habitat area. Tools may be sanitized using a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution. One minute after sanitizing, you may apply an oil based lubricant to chainsaw chains or other metallic parts to prevent corrosion.

c. Only dedicated tools and chainsaws should be used to sample known or suspected ROD infected trees.

d. Vehicles, machinery, and equipment must be cleaned as described in (1) above.

5. Imported firewood, logs, and ‘ōhi‘a parts:

a. ‘Ōhi‘a firewood, ‘ōhi‘a logs, and ‘ōhi‘a parts should not be transported.

6. For individuals working in the field:

a. **Before going into the field**, visually inspect and clean your clothes, boots, pack, radio harness, tools and other personal gear and equipment, for seeds, soil, plant parts, insects, and other debris. A small brush is handy for cleaning boots, equipment and gear. Soles of shoes should be sanitized using a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution.

b. **Immediately before leaving the field**, visually inspect and clean your clothes, boots, pack, radio harness, tools, and other personnel gear and equipment, for seeds, soil, plant parts, insects, and other debris. Soles of shoes should be sanitized using a solution of >70% isopropyl alcohol or a freshly mixed 10% bleach solution.

c. **Little fire ants nest in trees.** If you are under a tree and that tree is bumped or somehow stressed, the threat response of the ants is to fall from the leaves and sting the person under the tree. If you are subject to an ant attack, do not panic. The ants are extremely small but their stings are painful so make sure you remove all ants from your body and clothing. The stings cause inch long welts that are itchy and painful, and can last for weeks. Treat stings as you would other insect stings. In some persons stings can produce life threatening reactions. Stocking antihistamine in the first aid kit is a reasonable precaution.

d. **Rat Lungworm disease** is caused by a parasite that can infect humans who consume raw or undercooked infected snails or slugs or consume raw produce that contains a small infected snail or slug. Infection is rare but can be serious. Symptoms can include severe headache, neck stiffness, low grade fever, nausea, and vomiting anywhere from 1-6 weeks after exposure. The disease is not spread person to person. Anyone who handles snails or slugs should wear gloves and/or wash hands. Eating unwashed produce is discouraged.

DAVID Y. IGE
GOVERNOR OF HAWAII



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

REF: OCCL: MC

Correspondence HA-16-118

FEB 19 2016

Stephanie Nagata
Director, Office of Mauna Kea Management
640 N. Aohoku Place
Hilo, HI 96720

SUBJECT: NOTICE OF INTENT TO DECOMMISSION
Caltech Submillimeter Observatory
University of Hawai'i at Hilo Hoku Kea Telescope
Mauna Kea Science Reserve, Ka'ohe Mauka, Hāmākua District, Hawai'i
TMK (3) 4-4-015:009

The Department of Land and Natural Resources (DLNR) Office of Conservation and Coastal Lands (OCCL) has reviewed the Notices of Intent to Decommission the Caltech Submillimeter Observatory and the University of Hawai'i at Hilo Hoku Kea Telescope, both in the Mauna Kea Science Reserve.

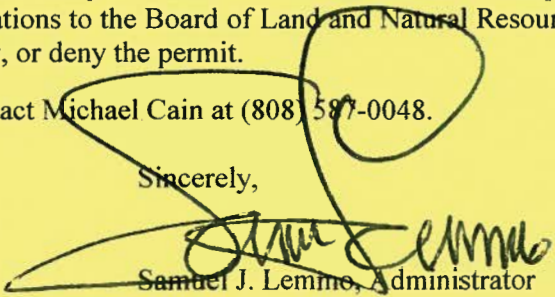
Pursuant to the Decommissioning Plan, a subplan of the Mauna Kea Comprehensive Management Plan, the decommissioning of an astronomy facility in the Science Reserve is a multi-step process involving 1) a Notice of Intent, 2) an environmental due diligence review, 3) a Site Deconstruction and Removal Plan, 4) a Site Restoration Plan, and, if necessary, 5) a Remedial Action Plan.

Both Notices of Intent appear to be in compliance with the requirements of the Decommissioning Plan. The next steps will be the preparation of an environmental assessment and a Conservation District Use Application (CDUA) for each of the proposals. The environmental assessment should discuss the preferred alternatives for the deconstruction and removal of the facilities, and the restoration plan for the sites.

The environmental assessment and the CDUA can be processed simultaneously by our office. At the end of the 180-day review process, dated from acceptance of the CDUA and draft EA for processing, our office will present our analysis and recommendations to the Board of Land and Natural Resources. The Board will have the final authority to approve, modify, or deny the permit.

If you have any questions please contact Michael Cain at (808) 587-0048.

Sincerely,


Samuel J. Lemmo, Administrator
Office of Conservation and Coastal Lands

copy: Chair; Hawai'i Board member; Hawai'i Land Division; Hawai'i County Planning Department

Exhibit 8

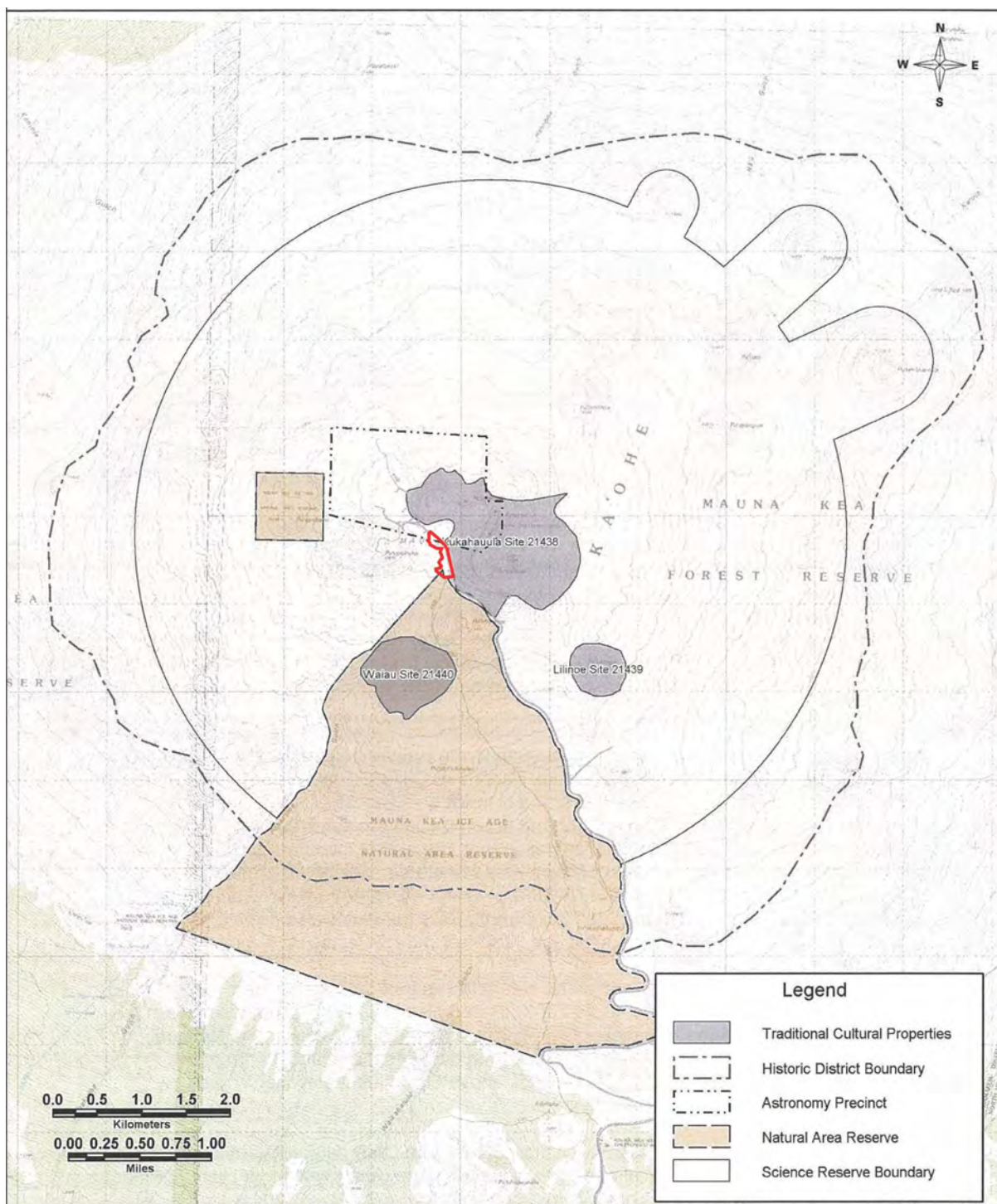


Figure 8. Mauna Kea Summit Region Historic District (Site 26869) and TCP boundaries (after McCoy et al. 2009), CSO project area outlined in red.