



## MEMORANDUM

September 12, 2023

TO: Maunakea Management Board  
FROM: Greg Chun, Executive Director  
SUBJECT: Request to Install Two Repeaters on Summit Lunchroom

- Date proposal rec'd: 8/14/2023
- Type **A** / B / C
- CMS MIP #: 308
- ED review: 8/14/2023
- EC review: 8/17/2023
- KKM review: 8/25/2023 \*retreat
- MKMB review: 9/12/2023
- Site Plan mailed: \_\_\_\_\_

### I. Project Description

The Center for Maunakea Stewardship (CMS) requests to remove two existing radio repeaters from the cinder block building and upgrade each with modern units installed on the Summit Lunchroom. There is critical need for continued use of these repeaters; the current Volunteer Organizations Active in Disaster (VOAD) repeater, for example, was activated during the August 2023 Maui wildfire disaster. The cinder block building, originally approved under CDUP HA 954, will be removed as part of the Hōkū Ke‘a decommissioning, CDUP HA 3906.

The project was reviewed by the Environment Committee on August 17, 2023 and by Kahu Kū Mauna during their August 25-26, 2023 retreat. No concerns were expressed by either committee.

### II. Department of Land and Natural Resources Rules

The project presumes the following land use under HAR §13-5-22, P-8, Structures and Land Uses, Existing, (B-1) *Demolition, removal, or minor alteration of existing structures, facilities, land, and equipment.*

### III. Identified Resources

Four historic properties are identified and located within 500 meters of the project:

- Site 50-10-23-26869, Mauna Kea Region Summit Historic District;
- Site 50-10-23-21438, Kūkahau‘ula, a Traditional Cultural Property;
- Site 50-10-23-26224, USGS marker on the summit of Pu‘uwēkiu; and
- Site 50-10-23-21209, a suspected burial on Pu‘uwēkiu

The proposed land use is not anticipated to have any effect on these or any other historic or cultural resources. CMS has also determined the project will not extend or enlarge the Summit Lunchroom footprint and does not change the permitted use of the facility. No impacts are anticipated to any physical, biological, or recreational resources.



#### **IV. Comprehensive Management Plan Compliance**

The request is consistent with the Comprehensive Management Plan (CMP), the University's lease for the Science Reserve, and the Hawai'i Administrative Rules §20-26 for University-managed lands. Further, CMS' review of this proposal complies with the following CMP Actions:

- NR-10 (Natural Resources): Incorporate mitigation plans into project planning and conduct mitigation following new development.
  - All equipment brought to the summit will be inspected by a DLNR-approved biologist or by Department of Agriculture personnel before proceeding to Maunakea. Identified mitigation measures will be complied with. All large vehicles will be pressure washed to remove mud and debris that might harbor invasive species.
- AR-2 (Astronomical Resources): Prevent light pollution, radio frequency interference (RF) and dust.
  - Contractors and staff will be informed not to use cell phones, two-way radios, or other electromagnetic frequency emitting devices, and to keep within posted speed limits. All work will be done during daylight hours so as not to affect nighttime operations of other observatories.
- P-1 (Permitting and Enforcement): Comply with all applicable federal, state, and local laws, regulations, and permit conditions related to activities in the UH management Areas.
- P-4 (Permitting and Enforcement): Educate management staff and users of the mountain about all applicable rules and permit requirements.
  - All project workers will be required to attend cultural and environmental training prior to onsite arrival.
- IM-5 (Infrastructure and Maintenance): Develop and implement a Debris Removal, Monitoring and Prevention Plan.
  - All rubbish shall be kept in a windproof rubbish bin. All perishable materials such as food and food wrappers shall be removed daily.
- C-9 (Construction Guidelines): Inspection of construction materials
  - Shipping containers and crates will be inspected by a DLNR-approved biologist or by Department of Agriculture personnel prior to arriving at Maunakea. Identified mitigation measures will be complied with.
- EO-2 (Education and Outreach): Require orientation of users.
- OI-3 (Ongoing Operations and Implementation Management Actions): Coordinate approach to resource management.
  - Installation of the repeaters may not directly affect Maunakea resources, but have provided critical communication during emergencies affecting life and property

#### **V. Center for Maunakea Stewardship (CMS) Recommendation**

CMS recommends the following conditions be implemented should this request receive OCCL Site Plan Approval:

- Best Management Practices will be employed.
- The work area will be clearly delineated to warn the public of any hazards.
- All project participants must attend a Maunakea Orientation prior to work.
- Allow Maunakea Rangers to visit and monitor activities.
- Ensure that loose tools or equipment are not left unattended and are properly stored at the end of each day.



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- In preparation for high wind conditions protocols must include measures to ensure debris and equipment are not blown from the job site.
- All improvements shall be designed and installed to withstand the severe weather conditions on the mountain.
- Removal and proper disposal of all waste material. All perishable items including food, food wrappers and containers, etc. shall be removed from the site at the end of each day and properly disposed.
- Use of lighting from sunset to sunrise is prohibited unless otherwise stated in the project proposal and approved.
- Employ invasive species prevention best practices, including inspections of materials by a DLNR-approved biologist, as identified in the *Maunakea Invasive Species Management Plan* prior to entering UH managed lands. Inspections shall not occur on UH managed lands on Maunakea, at State or County parks, along public roadsides, or on Department of Hawaiian Home Lands.
- Motorized equipment, when stationary, must have a drain-pan in place suitable for catching fuel or fluid leaks.
- Nēnē (*Branta sandvicensis*) may be present. If a nēnē appears within 100 feet (30.5 meters) of ongoing work, all activity shall be temporarily suspended until the animal leaves the area of its own accord. Feeding of nēnē is prohibited.
- The project approval/permit may not be transferred or assigned. A copy of the approval/permit must be present on-site and available for review at all times while working on University-managed lands.
- No use of mechanized equipment is allowed unless authorized by this permit.
- Identify and comply with other permit requirements, such as County of Hawaii building permits or Department of Land & Natural Resources (see both any applicable DLNR permit and HAR §13-5-42 Standard conditions).
- Notify CMS in writing when field activity associated with the project is completed.
- The project must be completed within the time frame specified in the proposal and (when applicable) as provided for in DLNR approval.

# Facility Project Proposal for the UH-Managed Lands

for projects anticipated to be classified as having “Minimal Impact”

## Please mark all that apply to your project

- Project was reviewed in a 5- or 3-Year Plan
- Project is a CMP, lease, or sublease compliance measure (e.g., keeps the site in safe working order)
- Project involves heavy machinery
- Project requires ground disturbance such as digging or trenching
- Project will result in a change to the facility footprint

## Facility Name

Maunakea Summit Lunch Room Building, originally approved under CDUP HA-954.

## Brief Descriptive Title of Project

Installation of two communication repeaters on the Summit Lunch Room.

## Project Description

### USGS HVO Summit Repeater (“HVO”)

Since approximately 1977, USGS has operated a summit repeater located in the small cinder block building between the Hoku Kea and UK Infrared telescopes. This building and the USGS repeater will be removed as part of the Hoku Kea decommissioning. The project requests to replace the USGS repeater with an updated instrument installed on the summit lunch room building, approximately 100-yards to the north of the cinder block building. The updated repeater will have a similar sized mast and antenna, similar transmission characteristics (frequency, broadcast strength) but have a smaller interior electronics package.

### Civil Defense/VOAD Repeater (“VOAD”)

Since 2002, Hawaii Volunteer Organizations Active in Disaster (VOAD) has managed an amateur radio summit repeater located in the small cinder block building between the Hoku Kea and United Kingdom Infrared Telescope (UKIRT). The cinder block building and VOAD repeater will be removed as part of the Hoku Kea decommissioning. The project will replace the VOAD repeater with an updated model, installed on the summit lunch room building. The new repeater will be managed by Hawaii County Civil Defense (HCCD) and will have a similar sized mast and antenna, similar transmission characteristics (frequency, broadcast strength), and a smaller interior electronics package.

## Proposed Commencement Date

01 October, 2023

## Proposed Completion Date

31 December, 2023

Estimated Project Cost

\$5,000.00

Total size / area of proposed use

HVO

An approximately 15-foot high repeater mast and antenna (combined height) will be attached to the southeast exterior wall of summit lunch room building. Repeater electronics (approximately 3'x3'x2' dimensions) will be mounted inside the summit lunch room.

HCCD

An approximately 15-foot high repeater mast and antenna (combined height) will be attached to the northwest exterior wall of the summit lunch room building. Repeater electronics (approximately 3'x3'x2' dimensions) will be placed inside the summit lunch room building.

## Project Purpose and Need

### HVO

**This project to relocate and upgrade an existing HVO repeater is vital for USGS staff safety during field operations and contributes directly to community safety.** During the 2022 Maunaloa eruption, the repeater helped maintain communications with HVO field staff, enabling HVO to assess local hazards, issue warnings and improve scientific understanding to reduce the impacts of the eruption.

### VOAD/HCCD

**The VOAD repeater is a communications backup for Hawaii County Civil Defense.** It is activated when primary communications become threatened or are disrupted, allowing HCCD to communicate with amateur radio operators across the island. The VOAD repeater was activated during the August 2023 wildfire disaster on Maui and in 2014 following Hurricane Iselle, when the District of Puna lost power. The ability to communicate with communities helps response agencies and support organizations more effectively respond to disasters and protect island residents' lives and property. This repeater undergoes regularly-scheduled testing. The new HCCD instrument will continue this function.

### Has professional peer-review occurred

This proposed use has undergone consultation amongst Hawaii County administrators, University of Hawaii staff, USGS staff, and the professional astronomy community and leadership on Maunakea.

### Are there any related ongoing, pending, or planned projects associated with this submission?

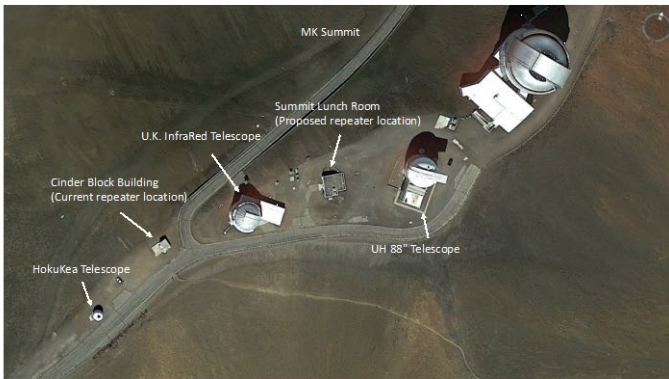
Yes, currently, both repeaters are housed at a small cinder block building that will be removed as part of the Hoku Kea decommissioning.

## Description of the Project

### Location

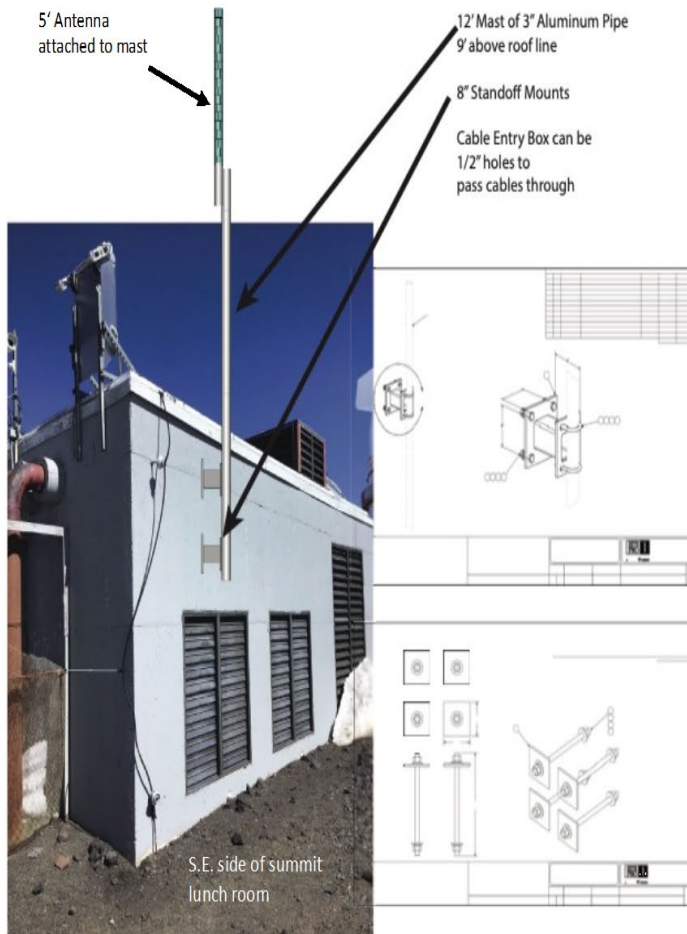
The HVO and VOAD summit repeaters and all associated equipment at the cinder block building will be removed. Updated, replacement repeaters will be installed on the summit lunch room:

- A new HVO summit repeater, updated to current technology, will be placed inside the summit lunch room. A mast with attached antenna will be mounted to the southeast exterior wall of the summit lunch room with antenna cables passing through the summit lunch room wall.
- A new HCCD repeater, updated to current technology, will be set in the communications room within the summit lunch room. A mast with attached antenna will be mounted to the northwest exterior wall of the summit lunch room with antenna cables passing through the wall.



## Description of the process of completing the project

Two 8-inch standoffs will be attached to both the northwest and southeast sides of the summit lunch room building wall with hardware that goes completely through the solid concrete wall. A 3-inch outside diameter mast will be attached to each pair of standoffs and extend approximately 9-feet above the summit lunch room roof line. A 5' Omni directional antenna will be attached to the top of the mast. A cable entry box will be installed, or two 1/2 inch holes drilled through the wall to allow cable passage. An equipment rack will be installed near the ceiling of the summit lunch room to keep the equipment out of the way. Following are photos of the exterior and interior of the summit lunch room building with depictions of the installation.



## Who will do the work?

USGS, CMS and IfA staff will do the work.

## Equipment & Transportation

No oversize vehicles or heavy equipment will be used for this project.



## Measures to protect the environment and/or mitigate impacts

### Impacts

A building mounted antenna will be attached to the southeast and northwest walls of the summit lunch room. Cable penetrations will be made for the antenna cable and a small equipment rack will be installed inside the summit lunch room. Any debris from wall penetrations will be removed from the mountain. All tools, equipment will be safely stowed except when work is in process. Trash and work debris will be removed from the mountain daily. Project work is limited to existing infrastructure and will not affect any biological, geological, hydrological, archaeological, historical, cultural, or recreational resources. The project will also not affect any individual's ability to enjoy these resources. CMS staff will ensure compliance with all applicable policies, rules, statutes, the Comprehensive Management Plan, and the Invasive Species Management plan for Maunakea.

### Compliance with Lease, Sublease, or Comprehensive Management Plan (CMP)

The project is not a CMP, lease, or sublease compliance action. Please see attached matrix for CMP applicability.

### Identify other required or associated permits

None

## Community Benefits

### Benefits to other Maunakea entities and/or global astronomy community

This project will help government agency response to local emergencies, allowing for maximum protection of life and property. It also allows HVO to perform its duties in monitoring of Hawaii's active and dormant volcanoes, remain informed about natural phenomena, and maintain uninterrupted, timely communication between staff.

### Benefits to the Hawaii Island community

The United States Geological Survey's Hawaiian Volcano Observatory (HVO) operates on the Island of Hawaii with the responsibility to monitor and respond to volcanic and seismic hazards. HVO currently operates 4 permanent and 1 mobile voice repeater systems that run on National Telecommunications and Information Administration (NTIA) authorized frequencies. One is located on the summit of Maunakea and is the subject of this proposal. The voice radio system operated by HVO is critical to field operations and serves as a means of communications for both safety of field personnel and for mission critical communications. HVO carries out its mandated activities 24 hours a day, 365 days a year.

The HCCD will help provide emergency communications to Hawaii Island residents. This repeater will help HCCD directly communicate with amateur radio operators in communities throughout Hawaii Island and help HCCD gather information from communities on their overall welfare and impacts. HCCD will also be able to receive assistance requests and status from amateur radio operators should 911 or other means of communication become inoperable.

Will data, publications, or other products be free and available to the public?

Yes. Both HVO and HCCD provide public websites with, respectively, information about island volcanoes and additional natural and manmade disasters.

**For internal use only by CMS**

Review checklist

Staff review and report

(HCCD) Outside agency review or approval required

Environment Committee, if environmental impacts are anticipated

Kahu Ku Mauna, if cultural impacts are anticipated and KKM requested consultation, or the project was not included in a 5YP or 3YP

Pending\_ Maunakea Management Board

**MAUNA KEA COMPREHENSIVE MANAGEMENT PLAN**

**COMPONENT PLAN: UNDERSTANDING AND PROTECTING MAUNA KEA'S RESOURCES**

<b>NATIVE HAWAIIAN CULTURAL RESOURCES</b>			
		<b>Subplans</b>	<b>Comments</b>
<b>Management</b>			
CR-1	Kahu Kū Mauna shall work with families with lineal and historical connections to Mauna Kea, cultural practitioners, and other Native Hawaiian groups, including the Mauna Kea Management Board's Hawaiian Culture Committee, toward the development of appropriate procedures and protocols regarding cultural issues.	NRMP 5.1.1 CRMP 4.2.1 PAP 2.3, 6.1, 6.3, 6.8	N/A
CR-2	Support application for designation of the summit region of Mauna Kea as a Traditional Cultural Property, per the National Historic Preservation Act of 1966, as amended, 16 U.S.C. 470 et seq. in consultation with the larger community.	CRMP 2.4.2.1	N/A
CR-3	Conduct educational efforts to generate public awareness about the importance of preserving the cultural landscape.	NRMP 4.4.2 CRMP 4.3.3 PAP 4.2, 5.2, 6.1	N/A
<b>Cultural Practices</b>			
CR-4	Establish a process for ongoing collection of information on traditional, contemporary, and customary cultural practices.	CRMP 4.2.1.1	N/A
CR-5	Develop and adopt guidelines for the culturally appropriate placement and removal of offerings	CRMP 4.2.1.3 PAP 6.3, 6.8	N/A
CR-6	Develop and adopt guidelines for the visitation and use of ancient shrines.	CRMP 4.2.1.5 PAP 2.7.2, 6.3	N/A
CR-7	Kahu Kū Mauna shall take the lead in determining the appropriateness of constructing new Hawaiian cultural features.	CRMP 4.2.1.6	N/A
CR-8	Develop and adopt a management policy for the UH Management Areas on the scattering of cremated human remains.	CRMP 4.2.1.7	N/A
CR-9	A management policy for the cultural appropriateness of building ahu or "stacking of rocks" will need to be developed by Kahu Kū Mauna who may consider similar policies adopted by Hawai'i Volcanoes National Park.	CRMP 4.2.1.8 PAP 6.8	N/A
<b>NATIVE HAWAIIAN CULTURAL RESOURCES</b>			
		<b>Subplans</b>	<b>Comments</b>
<b>Historic Properties</b>			
CR-10	Develop and implement a historic property monitoring program to systematically monitor the condition of the historic district and all historic properties, including cultural sites and burials.	CRMP 4.3.1 PAP 5.2	N/A
CR-11	Complete an archaeological survey of the portions of the Summit Access Road corridor that are under UH management.	CRMP 4.3.7	N/A
CR-12	Consult with Kahu Kū Mauna about establishing buffers (preservation zones) around known historic sites in the Astronomy Precinct, to protect them from potential future development.	CRMP 4.2.7	N/A
CR-13	Develop and implement a burial treatment plan for the UH Management Areas in consultation with Kahu Kū Mauna Council, MKMB's Hawaiian Culture Committee, the Hawai'i Island Burial Council, recognized lineal or cultural descendants, and SHPD.	CRMP 4.3.2, 4.3.7	N/A
CR-14	Immediately report any disturbance of a shrine or burial site to the rangers, DOCARE, Kahu Kū Mauna Council, and SHPD.	CRMP 4.3.1.6 PAP 2.5.1	N/A
<b>NATURAL RESOURCES</b>			
		<b>Subplans</b>	<b>Comments</b>
<b>Threat Prevention and Control</b>			
NR-1	Limit threats to natural resources through management of permitted activities and uses.	NRMP 4.2.3	Project will comply with permit conditions.
NR-2	Limit damage caused by invasive species through creation of an invasive species prevention and control program.	NRMP 4.2.3.7, 4.3 PAP 2.7.1, 6.3	Project will follow invasive species protection standard operating procedures.
NR-3	Maintain native plant and animal populations and biological diversity.	NRMP 4.2.3.8	N/A
NR-4	Minimize barriers to species migration, to help maintain populations and protect ecosystem processes and development.	NRMP 4.2.3.11	N/A
NR-5	Manage ecosystems to allow for response to climate change.	NRMP 4.2.3.11	N/A
NR-6	Reduce threats to natural resources by educating stakeholders and the public about Mauna Kea's unique natural resources.	NRMP 4.4 PAP 2.7.1, 4.2 5.2, 6.1, 6.3, 6.6	N/A
<b>Ecosystem Protection, Enhancement &amp; Restoration</b>			

NR-7	Delineate areas of high native diversity, unique communities, or unique geological features within the Astronomy Precinct and at Hale Pōhaku and consider protection from development.	NRMP 4.1, 4.2.3.1	N/A
NR-8	Consider fencing areas of high native biodiversity or populations of endangered species to keep out feral ungulates (applies to areas below 12,800 ft. elevation).	NRMP 4.2.3.7, 4.3	N/A
NR-9	Increase native plant density and diversity through an outplanting program.	NRMP 4.3, 4.4	N/A
NR-10	Incorporate mitigation plans into project planning and conduct mitigation following new development.	NRMP 4.3	N/A
NR-11	Conduct habitat rehabilitation projects following unplanned disturbances.	NRMP 4.3	N/A
NR-12	Create restoration plans and conduct habitat restoration activities, as needed.	NRMP 4.3	N/A
<b>Program Management</b>			
NR-13	Increase communication, networking, and collaborative opportunities, to support management and protection of natural resources.	NRMP 4.1.3.3, 4.3, 5.1.3 PAP 4.2, 4.5	N/A
NR-14	Use the principles of adaptive management when developing programs and methodologies. Review programs annually and revise any component plans every five years, based on the results of the program review.	NRMP 5.2 PAP 5.1, 5.2, 6.4, 6.7, 7	N/A
<b>Inventory, Monitoring and Research</b>			
NR-15	Conduct baseline inventories of high-priority resources, as outlined in an inventory, monitoring, and research plan.	NRMP 4.1	N/A
NR-16	Conduct regular long-term monitoring, as outlined in an inventory, monitoring, and research plan.	NRMP 4.1 PAP 6.4	N/A
NR-17	Conduct research to fill knowledge gaps that cannot be addressed through inventory and monitoring.	NRMP 4.1.2.3	N/A
NR-18	Develop geo-spatial database of all known natural resources and their locations in the UH Management Areas that can serve as baseline documentation against change and provide information essential for decision-making.	NRMP 4.1, 4.5	N/A
<b>EDUCATION AND OUTREACH</b>		<b>Subplans</b>	<b>Comments</b>
<b>Program Development</b>			
EO-1	Develop and implement education and outreach program	NRMP 4.1 CRMP 4.3.3 PAP 2.7.1, 4.2, 5.2, 6.1, 6.3, 6.6	N/A
<b>Education</b>			
EO-2	Require orientation of users, with periodic updates and a certificate of completion, including but not limited to visitors, employees, observatory staff, contractors, and commercial and recreational users.	NRMP 4.4.2 PAP 6.1, 6.6	All workers involved with this project will either have current training or receive training in CMS resource orientation as required.
EO-3	Continue to develop, update, and distribute materials explaining important aspects of Mauna Kea.	CRMP 4.3.3 PAP 6.1	N/A
EO-4	Develop and implement a signage plan to improve signage throughout the UH Management Areas (interpretive, safety, rules and regulations).	NRMP 4.4.2 PAP 4.2, 5.2, 6.2	N/A
EO-5	Develop interpretive features such as self-guided cultural walks and volunteer-maintained native plant gardens.	NRMP 4.3, 4.4.2 CRMP 4.3.3 PAP 6.2	N/A
EO-6	Engage in outreach and partnerships with schools, by collaborating with local experts, teachers, and university researchers, and by working with the 'Imiloa Astronomy Center of Hawai'i.	NRMP 4.4.2 PAP 5.2, 6.1	N/A
<b>Outreach</b>			
EO-7	Continue and increase opportunities for community members to provide input to cultural and natural resources management activities on Mauna Kea, to ensure systematic input regarding planning, management, and operational decisions that affect natural resources, sacred materials or places, or other ethnographic resources with which they are associated.	NRMP 4.4.2 CRMP 5.3 PAP 5.2, 6.3, 6.8	N/A
EO-8	Provide opportunities for community members to participate in stewardship activities.	NRMP 4.4.2	N/A
<b>ASTRONOMICAL RESOURCES</b>		<b>Subplans</b>	<b>Comments</b>
<b>Protection of Astronomical Resources</b>			

AR-1	Operate the UH Management Areas to prohibit activities resulting in negative impacts to astronomical resources.	PAP 5.1	N/A
AR-2	Prevent light pollution, radio frequency interference (RFI) and dust.	NRMP 4.2.3.2	No light pollution will be generated from this project, which will occur during daylight hours only. RFI and dust will also be negligible.
<b>COMPONENT PLAN: MANAGING ACCESS, ACTIVITIES AND USES</b>			
<b>ACTIVITIES AND USES</b>		<b>Subplans</b>	<b>Comments</b>
<b>General Management</b>			
ACT-1	Continue and update managed access policy of 1995 Management Plan.	NRMP 4.2, 4.4 PAP 2.5.2, 5.2, 7	N/A
ACT-2	Develop parking and visitor traffic plan.	NRMP 3.1.1.2 PAP 5.2, 6.4, 6.6, 6.7	N/A
ACT-3	Maintain a presence of interpretive and enforcement personnel on the mountain at all times to educate users, deter violations, and encourage adherence to restrictions.	NRMP 5.1.2 CRMP 4.1.1 PAP 4.2, 4.4, 4.5, 4.6, 5.2, 6.1, 6.2, 6.5, 6.6, 6.7	N/A
ACT-4	Develop and enforce a policy that maintains current prohibitions on off-road vehicle use in the UH Management Areas and that strengthens measures to prevent or deter vehicles from leaving established roads and designated parking areas.	NRMP 4.2.3.1 CRMP 4.1.2 PAP 2.5.1, 2.5.2, 2.6.3, 5.2, 6.3, 6.5	N/A
<b>Recreational</b>			
ACT-5	Implement policies to reduce impacts of recreational hiking	NRMP 4.2.3.1 CRMP 4.2.3.4 PAP 3.3.7, 5.2, 6.2, 6.3	N/A
ACT-6	Define and maintain areas where snow-related activities can occur and confine activities to slopes that have a protective layer of snow.	NRMP 4.2.3.1 CRMP 4.2.3.2 PAP 3.3.5, 5.2, 6.1, 6.3, 6.4	N/A
ACT-7	Confine University or other sponsored tours and star-gazing activities to previously disturbed ground surfaces and established parking areas.	NRMP 6.2.3 CRMP 4.2.3.1 PAP 2.5.3, 2.6.2, 3.3.3, 5.2	N/A
ACT-8	Coordinate with DLNR in the development of a policy regarding hunting in the UH Management Areas.	NRMP 3.1.3.5 3.2.12 CRMP 4.2.3.3 PAP 2.5.1, 3.3.6, 5.2	N/A
<b>Commercial</b>			
ACT-9	Maintain commercial tour permitting process; evaluate and issue permits annually.	NRMP 3.1.4 PAP 2.5.3, 2.5.4, 3.3.3, 4.3, 5.2, 6.1, 6.7	N/A
ACT-10	Ensure CMS input on permits for filming activities	NRMP 3.1.4.2 PAP 2.5.3, 3.3.3, 4.3, 6.1, 6.7	N/A
ACT-11	Seek statutory authority for the University to regulate commercial activities in the UH Management Areas.	NRMP 1.4.2.3	N/A
<b>Scientific Research</b>			
ACT-12	Ensure input by CMS, MKMB, and Kahu Kū Mauna on all scientific research permits and establish system of reporting results of research to CMS.	NRMP 4.2.3.1, 4.2.3.7, 4.2.3.9 CRMP 4.2.6	N/A
<b>PERMITTING AND ENFORCEMENT</b>		<b>Subplans</b>	<b>Comments</b>
<b>Laws and Regulations</b>			

P-1	Comply with all applicable federal, state, and local laws, regulations, and permit conditions related to activities in the UH Management Areas.	NRMP 1.4.3 PAP 2.4, 2.5, 2.5.1, 2.5.2, 2.5.3, 5.1	CMS will comply with all applicable laws, administrative rules, regulations and permit requirements.
P-2	Strengthen CMP implementation by recommending to the BLNR that the CMP conditions be included in any Conservation District Use Permit or other permit.	NRMP 1.4.3.2	N/A
P-3	Obtain statutory rule-making authority from the legislature, authorizing the University of Hawai'i to adopt administrative rules pursuant to Chapter 91 to implement and enforce the management actions.	NRMP 1.4.3.2	N/A
P-4	Educate management staff and users of the mountain about all applicable rules and permit requirements.	NRMP 4.4 PAP 4.2, 5.2, 6.1, 6.2, 6.5	Project manager will be familiar with all rules and permit requirements and will inform staff.
<b>Enforcement</b>			
P-5	Continue coordinating with other agencies on enforcement needs.	NRMP 5.1 PAP 4, 6.5	N/A
P-6	Obtain legal authority for establishing, and then establish, a law enforcement presence on the mountain that can enforce rules for the UH Management Areas on Mauna Kea.	NRMP 1.4.2.3, 3.1.3.2, 5.1 PAP 4.4, 4.5, 4.6, 5.2, 6.5, 6.6	N/A
P-7	Develop and implement protocol for oversight and compliance with Conservation District Use Permits.	NRMP 1.4.2.3	N/A
P-8	Enforce conditions contained in commercial and Special Use permits.	NRMP 3.1.4 PAP 2.5.3, 3.3.3, 4.3, 4.5, 4.6, 6.5	N/A
<b>COMPONENT PLAN: MANAGING THE BUILT ENVIRONMENT</b>			
<b>INFRASTRUCTURE AND MAINTENANCE</b>		<b>Subplans</b>	<b>Comments</b>
<b>Routine Maintenance</b>			
IM-1	Develop and implement an OMMP.		N/A
IM-2	Reduce impacts from operations and maintenance activities by educating personnel about Mauna Kea's unique resources.	NRMP 4.4	All workers involved with this project will have current Orientation certification.
IM-3	Conduct historic preservation review for maintenance activities that will have an adverse effect on historic properties.	CRMP 4.1.3	N/A
IM-4	Evaluate need for and feasibility of a vehicle wash station near Hale Pōhaku, and requiring that vehicles be cleaned.	NRMP 4.2.3.7	N/A
IM-5	Develop and implement a Debris Removal, Monitoring and Prevention Plan.	NRMP 4.2.3.5 CRMP 4.1.4, 4.3.4	Protocols will be in place to prevent debris, material, and equipment are not blown away by high winds. Materials and tools will be secured at the end of each work day. All waste material will be removed and properly disposed of.
IM-6	Develop and implement an erosion inventory and assessment plan.	NRMP 3.2.4, 4.1.4.2, 4.2.3.4 PAP 2.6.3, 6.3, 6.4	N/A
IM-7	Prepare a plan, in collaboration with the Department of Defense, to remove military wreckage from a remote area of the UH Management Areas, while ensuring protection of natural and cultural resources.	CRMP 4.3.4.1	N/A
<b>Infrastructure</b>			
IM-8	Assess feasibility of paving the Summit Access Road.	NRMP 4.2.3	N/A
IM-9	Evaluate need for additional parking lots and vehicle pullouts and install if necessary.	NRMP 3.1.1.2.3 PAP 5.2, 5.4, 6.7	N/A
IM-10	Evaluate need for additional public restroom facilities in the summit region and at Hale Pōhaku, and install close-contained zero waste systems if necessary.	NRMP 3.1.3.1, 3.2.3, 4.2.3.3 PAP 5.2, 6.4, 6.6, 6.7, 6.8	N/A
<b>Sustainable Technologies</b>			
IM-11	Encourage existing facilities and new development to incorporate sustainable technologies, energy efficient technologies, and LEED standards, whenever possible, into facility design and operations.		N/A
IM-12	Conduct energy audits to identify energy use and system inefficiencies, and develop solutions to reduce energy usage.	NRMP 4.2.3.3	N/A

IM-13	Conduct feasibility assessment, in consultation with Hawaii Electric Light Company, on developing locally-based alternative energy sources.	NRMP 3.1.1.2.3	N/A
IM-14	Encourage observatories to investigate options to reduce the use of hazardous materials in telescope operations.		N/A
CONSTRUCTION GUIDELINES		Subplans	Comments
General Requirements			
C-1	Require an independent construction monitor who has oversight and authority to insure that all aspects of ground based work comply with protocols and permit requirements.	NRMP 3.2, 4.2	N/A
Best Management Practices			
C-2	Require use of Best Management Practices Plan for Construction Practices.	NRMP 4.2.3	CMS will utilize construction BMPs such as for worksite safety, waste handling and disposal, ensure infrastructure integrity against hurricane-force winds, and limit activity to daytime only.
C-3	Develop, prior to construction, a rock movement plan.	NRMP 4.2.3.1	N/A
C-4	Require contractors to provide information from construction activities to CMS for input into CMS information databases.		N/A
C-5	Require on-site monitors (e.g., archaeologist, cultural resources specialist, entomologist) during construction, as determined by the appropriate agency.	CRMP 4.2.7	N/A
C-6	Conduct required archaeological monitoring during construction projects per SHPD approved plan.	CRMP 4.2.7	N/A
C-7	Education regarding historical and cultural significance	NRMP 4.4	All staff will have successfully completed the CMS resource orientation.
C-8	Education regarding environment, ecology and natural resources	NRMP 4.4	All observatory staff and contractors involved with this project will either have current training or receive training in CMS natural and cultural resource orientation as required.
C-9	Inspection of construction materials	NRMP 4.2.3.7	Deliveries subject to invasive species inspections will be inspected.
SITE RECYCLING, DECOMMISSIONING, DEMOLITION AND RESTORATION		Subplans	Comments
Site Recycling, Decommissioning, Demolition, and Restoration			
SR-1	Require observatories to develop plans to recycle or demolish facilities once their useful life has ended, in accordance with their sublease requirements, identifying all proposed actions.	NRMP 4.3.3.4.1	N/A
SR-2	Require observatories to develop a restoration plan in association with decommissioning, to include an environmental cost-benefit analysis and a cultural assessment.	NRMP 4.3.3.4.1	N/A
SR-3	Require any future observatories to consider site restoration during project planning and include provisions in subleases for funding of full restoration.	NRMP 4.3.3.4.1	N/A
CONSIDERING OF FUTURE LAND USE		Subplans	Comments
Facility Planning Guidelines			
FLU-1	Follow design guidelines presented in the 2000 Master Plan.	NRMP 5.1.1	The relatively small size of the repeaters and siting on the lunchroom structure should have minimal impact on the overall appearance of the Summit Lunchroom.
FLU-2	Develop a map with land-use zones in the Astronomy Precinct based on updated inventories of cultural and natural resources, to delineate areas where future land use will not be allowed and areas where future land use will be allowed but will require compliance with prerequisite studies or analysis prior to approval of Conservation District Use Permit.	NRMP 4.3.3.1	N/A
FLU-3	Require cataloguing of initial site conditions for use when conducting site restoration.		N/A
FLU-4	Require project specific visual rendering of both pre- and post-project settings to facilitate analysis of potential impacts to view planes.	NRMP 4.1.4.11	See pages 4-5 of project proposal. No view planes will be adversely affected.
FLU-5	Require an airflow analysis on the design of proposed structures to assess potential impacts to aeolian ecosystems.	NRMP 4.1.4.4	N/A
FLU-6	Incorporate habitat mitigation plans into project planning process.	NRMP 4.3.3.3	N/A
FLU-7	Require use of close-contained zero-discharge waste systems for any future development in the summit region, from portable toilets to observatory restrooms, if feasible.	NRMP 3.1.1.2.6	N/A
COMPONENT PLAN: MANAGING OPERATIONS			
OPERATIONS AND IMPLEMENTATION		Subplans	Comments
OI-1	Maintain CMS, MKMB, and Kahu Kū Mauna in current roles, with CMS providing local management of the UH Management Areas, and MKSS providing operational and maintenance services.		Project complies with community board review.
OI-2	Develop training plan for staff and volunteers.	NRMP 5.1 CRMP 5.2 PAP 5.1, 5.2, 6.1, 6.4, 6.5	N/A

OI-3	Maintain and expand regular interaction and dialogue with stakeholders, community members, surrounding landowners, and overseeing agencies to provide a coordinated approach to resource management.	NRMP 5.1 PAP 5.1	N/A
OI-4	Establish grievance procedures for CMS, to address issues as they arise.	PAP 6.6	N/A
OI-5	Update and implement emergency response plan.	CRMP 4.1.6, 4.3.5 PAP 6.1, 6.4, 6.5, 6.7	N/A
<b>MONITORING, EVALUATION AND UPDATES</b>			
<b>Subplans</b>			
MEU-1	Establish a reporting system to ensure that the MKMB, DLNR, and the public are informed of results of management activities in a timely manner.	NRMP 4.1.3.3 PAP 6.4, 6.6, 7	N/A
MEU-2	Conduct regular updates of the CMP that reflect outcomes of the evaluation process, and that incorporate new information about resources.	NRMP 5.2 CRMP 5.5 PAP 7	N/A
MEU-3	Revise and update planning documents, including the master plan, leases, and subleases, so that they will clearly assign roles and responsibilities for managing Mauna Kea and reflect stewardship matters resolved with DLNR.	PAP 7	N/A