

UH Managed lands – Project Proposal

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

Name: Smithsonian Astrophysical Observatory (SAO) – Submillimeter Array (SMA)

Project Name: SMA Meteorological Instruments

- **Brief Description of the Project**

Installation and continued operation of meteorological instruments on the roof platform of the existing SMA hangar on Maunakea.

- **Identified Land Use (see HAR § 13-5-22 through 13-5-25)**

HAR §13-5-22, P-1 DATA COLLECTION, (B-1) Basic data collection, research, education, and resource evaluation that results in minor disturbance to natural resources or land.

- **Identify the existing CDUP this proposal alters or affects, if any**

HA-2728, 1994. SMA

- **Identify [University of Hawai'i exemption](#) per HAR § 11-200-8(a), if any**

Exemption Class #6: Construction or placement of minor structures accessory to existing facilities. #4. Within the building footprint and envelope (building perimeter and height) construction of additional building floor area limited to no more than 10% of the existing building floor area.

The weather instruments will be mounted on the roof platform of the existing SMA hangar.

- **Tax Map Key(s):** 4-4-015:009 – Mauna Kea Science Reserve (por.)

- **Proposed Commencement Date:** April 2019

- **Proposed Completion Date:** Indefinite (subject to SMA sublease through 2033)

- **Estimated Project Cost:** \$ 2,000

- **Total size / area of proposed use:**

Project Purpose and Need

- For operation of the SMA, continuous measurements of current meteorological conditions are necessary. These data are used to determine safe operating limits for observations and also for precise pointing of the antennas.

- The meteorological instruments will measure air temperature, pressure, and humidity along with wind speed and direction. The data will be recorded and will be made available to interested parties.

- The existing mast and instruments were installed as part of the original facility construction, but are located away from the working platform. This project will relocate the instruments to a location where they can be serviced more safely while maintaining the integrity of the long-term record.

Existing Conditions at Project Site(s)

- **Geology, Climate, & Hazards**

Maunakea is considered an active, post-shield phase volcano (USGS) rising to nearly 13,800 ft. Climate conditions at altitudes of 12,500 ft and above are often below freezing and when combined with humidity above 100% or precipitation, on the surfaces resulting in natural cinder movement from geophysical processes. The project site is a wall of the existing SMA hangar.

- **Flora, Fauna, Ecology, Water Resources**

None. The project site is the roof of the existing SMA hangar. OMKM performs routine monitoring for invasive species.

- **Cultural Resources**

The nearest discrete Historic Property is over 900 feet away from the SMA hangar. The site is part of the Maunakea Summit Region Historic District, SIHP # 26869. A comprehensive inventory of the site was completed in 2006. The "Archaeological Inventory Survey of the Mauna Kea Science Reserve" was completed in 2010 and annual routine monitoring continues by OMKM.

- **Recreation**

None. For safety reasons, access to the roof of the SMA hangar is restricted to properly equipped, authorized personnel.

- **Built Infrastructure**

The meteorological instruments will be installed on the roof of the SMA hangar. The hangar itself is primarily used for maintenance of SMA antennas and ancillary equipment. Other existing permitted equipment on the hangar roof includes cameras, tipping radiometers, and the AMOS for meteor studies.

- **Landscaping & Visual Conditions**

The meteorological instruments will not be visible from the ground near the hangar. From further away, they will be visible although it will be much smaller than the overall size of the SMA hangar (Figures 1 & 2) and largely indistinguishable from the roof and other existing instrumentation. The instrument enclosures are white, similar to the existing instruments.

Description of the Project

- **Describe the process of completing the project.**

The meteorological instruments will record data continuously. The instruments will include an ultrasonic anemometer (6 in diameter & 8 in tall) mounted atop a 2–3 in diameter pole extending 3–4 ft above the platform railing; temperature, pressure, and humidity sensors housed in a radiation shield (5 in diameter & 8 in tall) attached to the same pole; and interface electronics in a box (10 in x 10 in x 6 in). All components will be attached securely to the roof platform.

- **Location**

The meteorological instruments will be installed on the roof of the SMA hangar.

- **Who will do the work?**

SMA staff will install the instruments.

- **Equipment & Transportation**

No transport of large equipment is anticipated. Supplies and small parts for installation and repairs, etc., will be transported in SMA light vehicles.

Measures to protect the environment and/or mitigate impacts

Protective Measures

- Notify OMKM in writing at least 5 days prior to beginning field work on UH-managed lands (Halepōhaku, Road Corridor, Maunakea Science Reserve, or Astronomy Precinct). No project notification will be accepted by OMKM until all permit requirements are submitted to and approved by OMKM (i.e. any required BMPs, Communication Plans, contract scope questions, etc. must be finalized and approved by OMKM more than 5 days in advance of project commencement).
- All project participants must attend an OMKM orientation *prior* to participating in work on Maunakea.
- Use of 4-wheel drive vehicles when traveling above Halepōhaku is required.
- Allow OMKM Rangers to visit and monitor activities.
- Comply with all actions and measures described in this proposal, including (community) benefits, CMP compliance list, and mitigation measures.
- Ensure that loose tools or equipment are not left unattended and are properly stored at the end of each day.
- In preparation for high wind conditions, protocols must include measures to ensure debris and equipment are not blown from the job site. Projects occurring in the summit region must verify that temporary and permanent infrastructure can sustain 120 mph winds.
- All improvements shall be designed and installed to withstand the severe weather conditions on the mountain.
- Remove and properly dispose 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.
- 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.
- Motorized equipment, when stationary, must have a drain-pan in place suitable for catching fuel or fluid leaks. To allow for expansion with reduced atmospheric pressure, fuel tanks should not be more than 3/4 full prior to transport to the summit (unless used as the fuel source for transport to the summit).
- Large, heavy, or oversized loads must submit notification to the Maunakea Road Conditions listserve at least one day prior to delivery. Loads requiring an escort on public roadways must have this escort accompany them to the final destination. Projects choosing not to do so must obtain approval from the Maunakea Rangers before arriving at Halepōhaku. Projects failing to submit notification or arrange for escort to the summit may be denied entry to Halepōhaku or above.
- 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 and Natural Resources (see both any applicable DLNR permit and HAR §13-5-42 Standard conditions)
- Placement of permanent: markers, monuments, mag nails, survey pins, etc. is not allowed without explicit prior approval from OMKM (and the State if required) for this purpose. ALL surveyors work must be shared with OMKM in digital format (i.e. CAD file as well as PDF) with coordinate info stored in and using a common, transferrable coordinate reference system such as “State Plane Coordinates (NAD83), Hawaii Zone 1.”
- Use of real-time GPS during any surveying or equipment operation requires advance written approval from OMKM and the Institute for Astronomy. Written approval should be requested at least 4 weeks prior to the proposed activity.
- Electronic and paper copies of all publications resulting from the work will be provided to OMKM.
- Notify OMKM 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 DLNR approval. Projects not completed within this timeframe are not allowed to continue (or commence) without explicit, prior, written approval from OMKM.

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

During the proposed work, SAO/SMA will comply will all applicable OMKM policies and procedures.

Applicable CMP management actions include:

COMPONENT PLAN: UNDERSTANDING AND PROTECTING MAUNA KEA'S RESOURCES			
ASTRONOMICAL RESOURCES		Subplans	Comments
Protection of Astronomical Resources			
AR-1	Operate the UH Management Areas to prohibit activities resulting in negative impacts to astronomical resources.	PAP 5.1	<i>SMA will comply with applicable OMKM policies and procedures.</i>
AR-2	Prevent light pollution, radio frequency interference (RFI) and dust.	NRMP 4.2.3.2	<i>SMA will comply with applicable OMKM policies and procedures. The meteorological instruments will not emit light, sound or any electromagnetic interference.</i>

- Identify other required or associated permits

None

- Five Year Outlook

Meteorological instruments were included in the SMA Five Year Outlook for 2019-2023.

Community Benefits

- Benefits to other Maunakea entities and/or global astronomy community
| Meteorological measurements at the SMA will complement measurements elsewhere on Maunakea, providing better understanding of conditions (and redundancy in case of equipment failure). |
- Benefits to the Hawaii Island community
| Meteorological measurements at the SMA will complement measurements elsewhere on Maunakea, providing better understanding of conditions (and redundancy in case of equipment failure). |
- Will data, publications, or other products be free and available to the public?
| Meteorological data will be provided on an open SMA webpage. |



Figure 1. The SMA hangar (center), JCMT (left), and SMA antennas (right) viewed from the Subaru catwalk. The existing AMOS is located in the center of the platform on the roof of the SMA hangar. The meteorological instruments will be installed near the north corner of the platform (arrow).



Figure 2. Magnified view of the SMA hangar roof from the Subaru catwalk. The existing AMOS is located near the center of the roof platform. The meteorological instruments will be installed near the north corner of the platform (circle). The existing mast outside of the platform will be removed.

DLNR Evaluation Criteria

After approval by the Maunakea Management Board, the Department of Land & Natural Resources or Board of Land & Natural Resources will evaluate the merits and approve the project based on the following eight criteria (§13-5-30). See <http://dlnr.hawaii.gov/occl/files/2013/08/13-5-2013.pdf>

1. The purpose of the Conservation District is to conserve, protect, and preserve the important natural and cultural resources of the State through appropriate management and use to promote their long-term sustainability and the public health, safety, and welfare. (ref §13-5-1) How is the proposed land use consistent with the purpose of the conservation district?

The project will help document resource conditions on Maunakea.

2. How is the proposed use consistent with the objectives of the Resource subzone of the land on which the land use will occur? (§13-5-13 The objective of this subzone is to ensure, with proper management, the sustainable use of the natural resources of those areas. This subzone shall encompass: lands necessary for providing future parkland and lands presently used for national, state, county, or private parks. Land suitable for outdoor recreational uses such as hunting, fishing, hiking, camping, and picnicking. [And other lands not applicable to Maunakea.]

The proposed use will help provide information that users of parklands, outdoor recreators, hikers, and others expect when visiting.

3. Describe how the proposed land use complies with the provisions and guidelines contained in chapter 205A, HRS, entitled “Coastal Zone Management”.

The project is not near nor is there a direct hydrological connection to the coastal zone.

4. Describe how the proposed land use will not cause substantial adverse impact to existing natural resources within the surrounding area, community or region.

The proposed use will occur solely on the roof of an existing building. The resulting information generated will help inform land owner and managers as to the status of the resources.

5. Describe how the proposed land use, including buildings, structures and facilities, is compatible with the locality and surrounding areas, appropriate to the physical conditions and capabilities of the specific parcel or parcels.

The proposed use will only occur in areas of existing development yet supports continuation of existing, approved uses such as research, public safety, and recreation which is one of the purposes the parcels are zoned for.

6. Describe how the existing physical and environmental aspects of the land, such as natural beauty and open space characteristics, will be preserved or improved upon.

The instruments will be on an existing building. This essentially involves relocating the mast and renovating the instruments, thus no change to physical or environmental aspects will occur.

7. If applicable, describe how subdivision of land will not be utilized to increase the intensity of land uses in the Conservation District.

[]
[No subdivision of land will occur.]

8. Describe how the proposed land use will not be materially detrimental to the public health, safety and welfare.

[The weather station data will be publicly available via the Maunakea Weather Center. While there are other weather stations on the summit, given the often extreme conditions the system redundancy helps ensure accurate information is always available. The instruments are designed to withstand the summit conditions.]

FOR BOARD ACTION