STATE OF HAWAI'I
DEPARTMENT OF LAND AND NATURAL RESOURCES
OFFICE OF CONSERVATION AND COASTAL LANDS
Honolulu, Hawai'i

180-Day Exp. Date: March 20, 2017

February 24, 2017

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

REGARDING: **Conservation District Use Application MA-3779**
Polarized Light from Atmospheres of Nearby Extra-Terrestrial Systems (PLANETS)

APPLICANTS: University of Hawai`i, Institute for Astronomy

AGENT: Charlie Fein, Vice President, KC Environmental, Inc. PO Box 1208, Makawao, HI 96768

LANDOWNER: State of Hawai`i, set aside by Executive Order 1987 to the University of Hawai`i

LOCATION: Haleakalā High Altitude Observatories Site (HO) at Pu`u Kolekole, ahupua`a of Papa`anui, moku of Honua`ula, Makawao District, Maui

TMK: (2) 2-2-007:008

ARE OF PARCEL: 18.166 acres (HO)

AREA OF USE: 0.86 acres

SUBZONE: General

DESCRIPTION OF AREA AND PROPOSED USE

The applicant proposes to alter an existing structure at the Haleakalā High Altitude Observatories Site (HO) to install a new astronomical facility known as Polarized Light from Atmospheres of Nearby Extra-Terrestrial Systems (PLANETS). The telescope would

be one of the world's highest contract optical telescopes designed for low-scattered light, high-contrast night-time observations.

The Observatories Site, popularly known as "Science City," lies in the Pu`u Kolekole volcanic cone near the summit of Haleakalā. The 18-acre parcel is wholly contained in Kolekole, and ranges in elevation from 9840 to 10,000 feet above mean sea level (AMSL). The project location is on the southern side of the parcel, at 9980 AMSL. It is in the General Subzone of the State Land Use Conservation District.

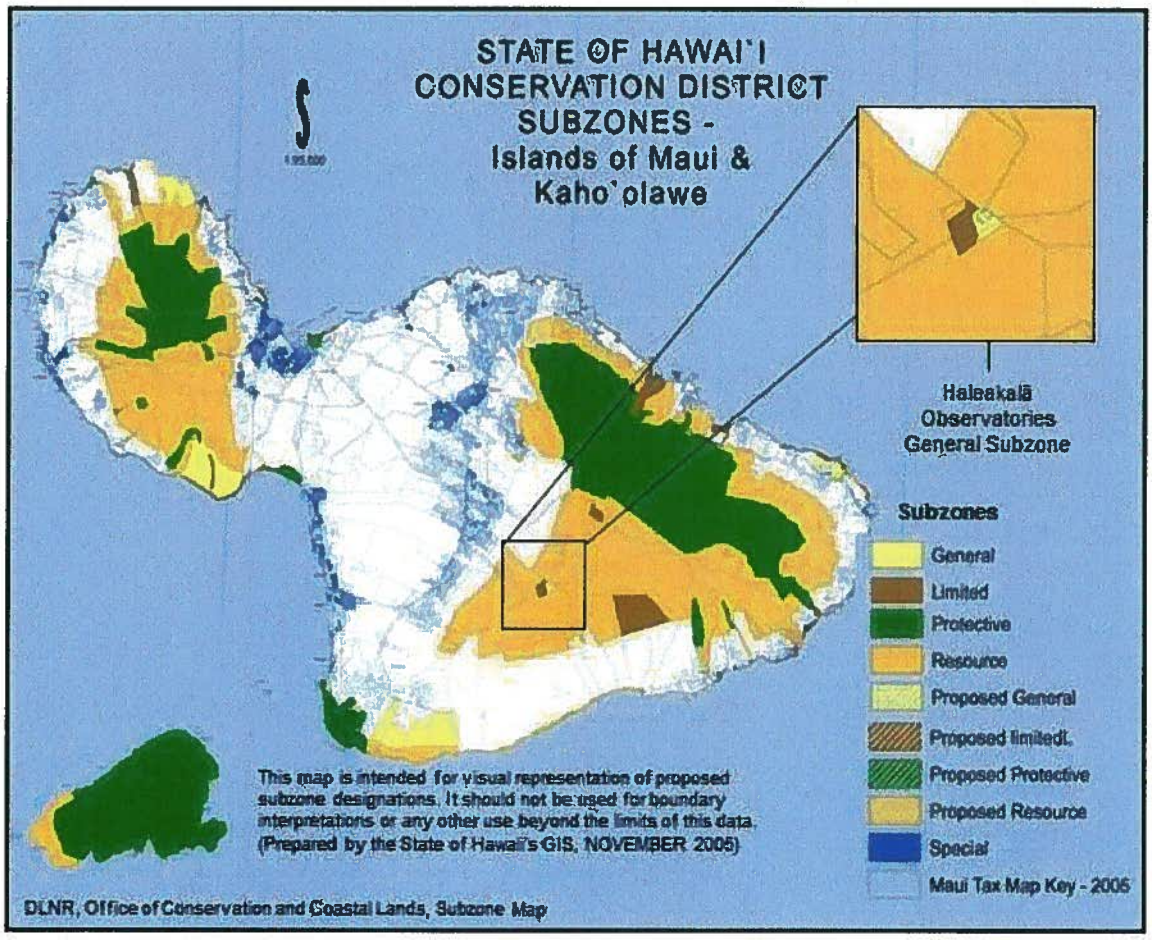

Figure 1 Conservation District Subzones on Maui

Approximately 40% of the HO parcel is developed with roads, buildings, parking areas, and walkways. The site has housed astronomical facilities since the early 1950s. Current observatories include the Mees Solar Observatory, the Zodiacal Observatory, Pan-STARRS, the Advanced Electro-Optical System, the Maui Space Surveillance Site, the Ground-based Electro-Optical Deep Space Surveillance (GEODSS), the Airglow Facility, the Neutron Monitor Station, and the Faulkes Telescope North. In addition, the Daniel K. Inouye Solar Telescope is currently under construction.

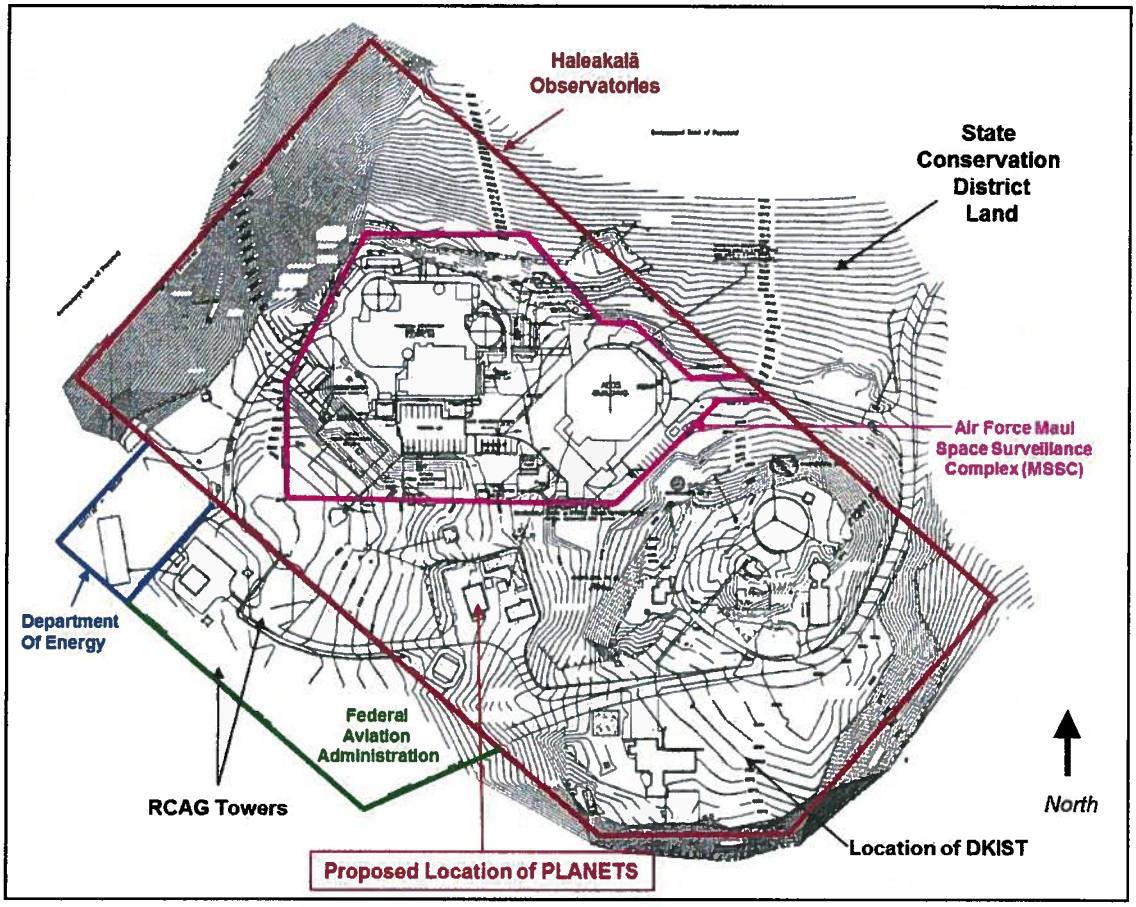

Figure 2 Topographic Map of Pu'u Kolekole with Property Boundaries

The facility would be developed by renovating an existing structure which was part of the former Baker-Nunn Super-Schmidt satellite tracking station, which in turn was built as part of the 1957-1958 International Geophysical Year (IGY). The Haleakalā facility included a small cinder block building with a sliding roof, as well as a living facility for observers. The Baker-Nunn cameras worked in conjunction with observations provided by hundreds of students and amateur scientists who were part of "Operation Moonwatch."

The Baker-Nunn cameras and Operation Moonwatch were gradually replaced by more advanced satellite tracking systems, and the facility on Haleakalā was shut down in 1976.

Other buildings on the site are currently being used as a storage garage, a meeting house for the Amateur Astronomy Club, and for the Tohoku University's Planetary Plasma and Atmospheric Research Center (PPARC).

The existing subject building previously housed the University of Chicago Cosmic Ray Neutron Monitor Station. It measures 41.71 feet by 28.83 feet, with a footprint of 1619.67 square feet and has a building volume of 10,359 cubic feet.

The proposed alterations would include removal of a section of the existing flat roof portion of the roof, and replacing it with a roll-off enclosure 6.46 feet tall to house the telescope. Other exterior work would include the installation of the roll-off steel frame requiring excavation of column footings on an existing concrete slab, and installation of a roll-top door on the south side of the structure. Interior modifications include the removal of interior walls and the construction of a telescope pedestal and foundation. This will result in an increase of 3966 cubic feet to the existing building volume.

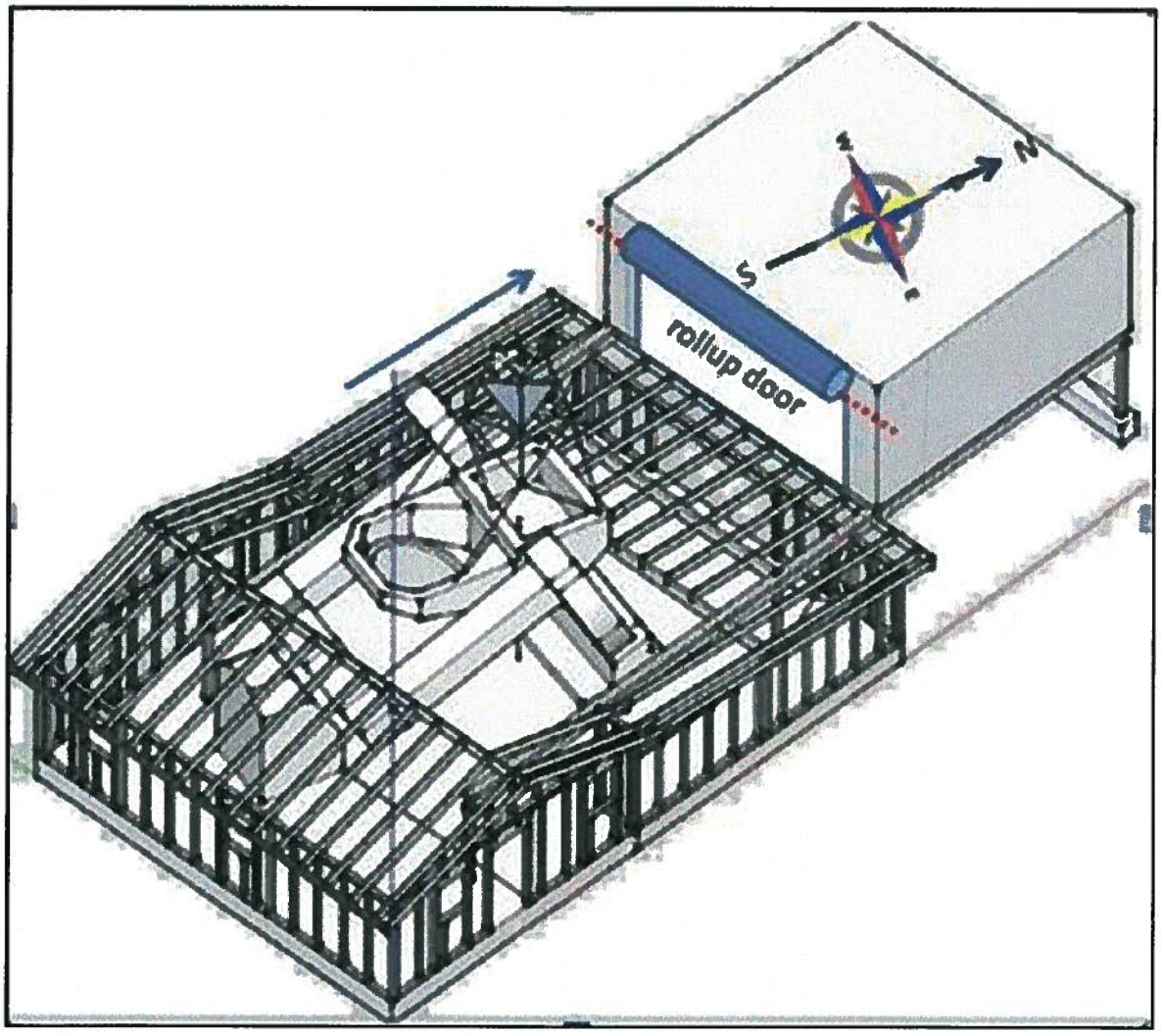

Figure 3 Schematic of proposed PLANETS modifications / Roll-off roof

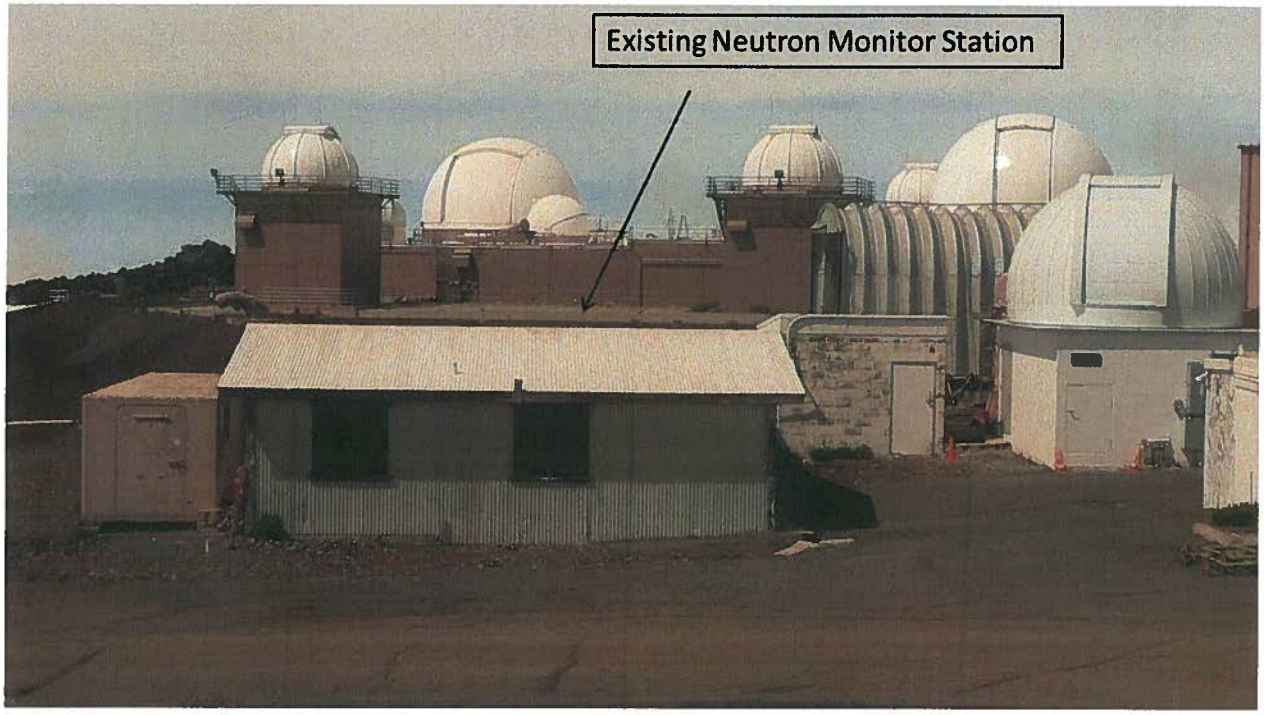

Figure 4 Appearance of the existing Neutron Monitor Station structure viewed from the south

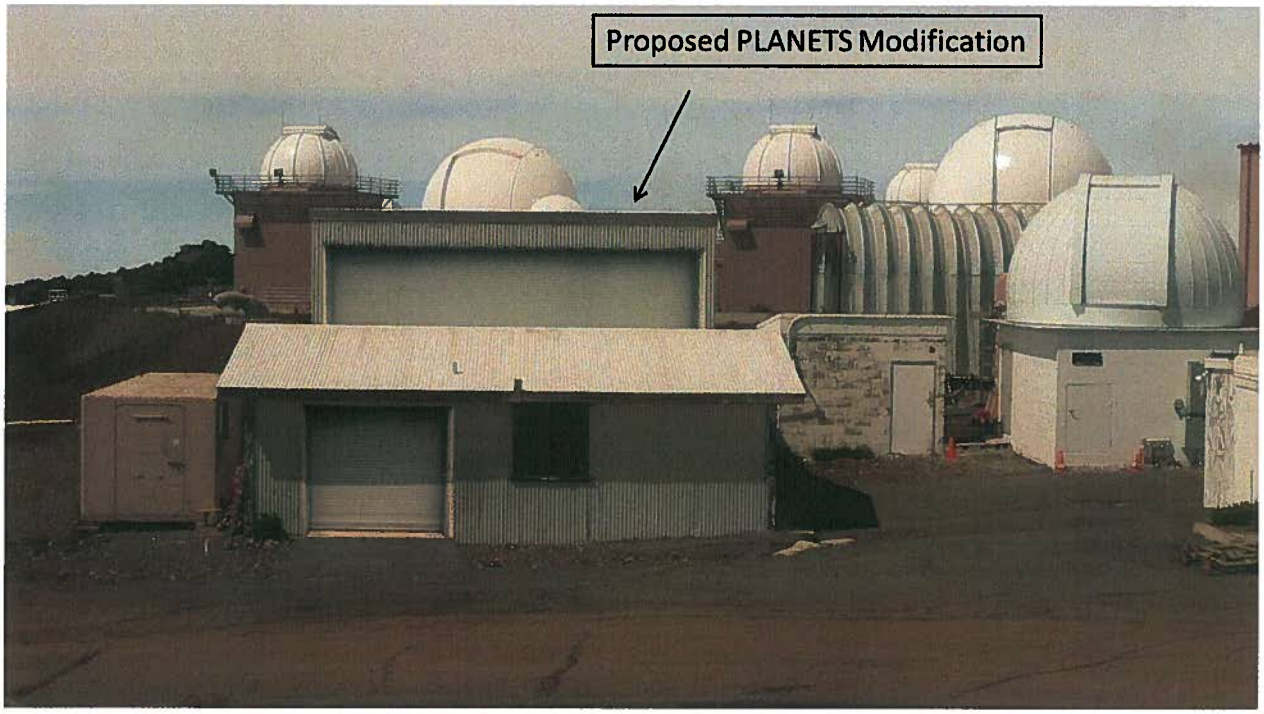

Figure 5 Exterior appearance of proposed PLANETS Telescope Facility after modification viewed from the south

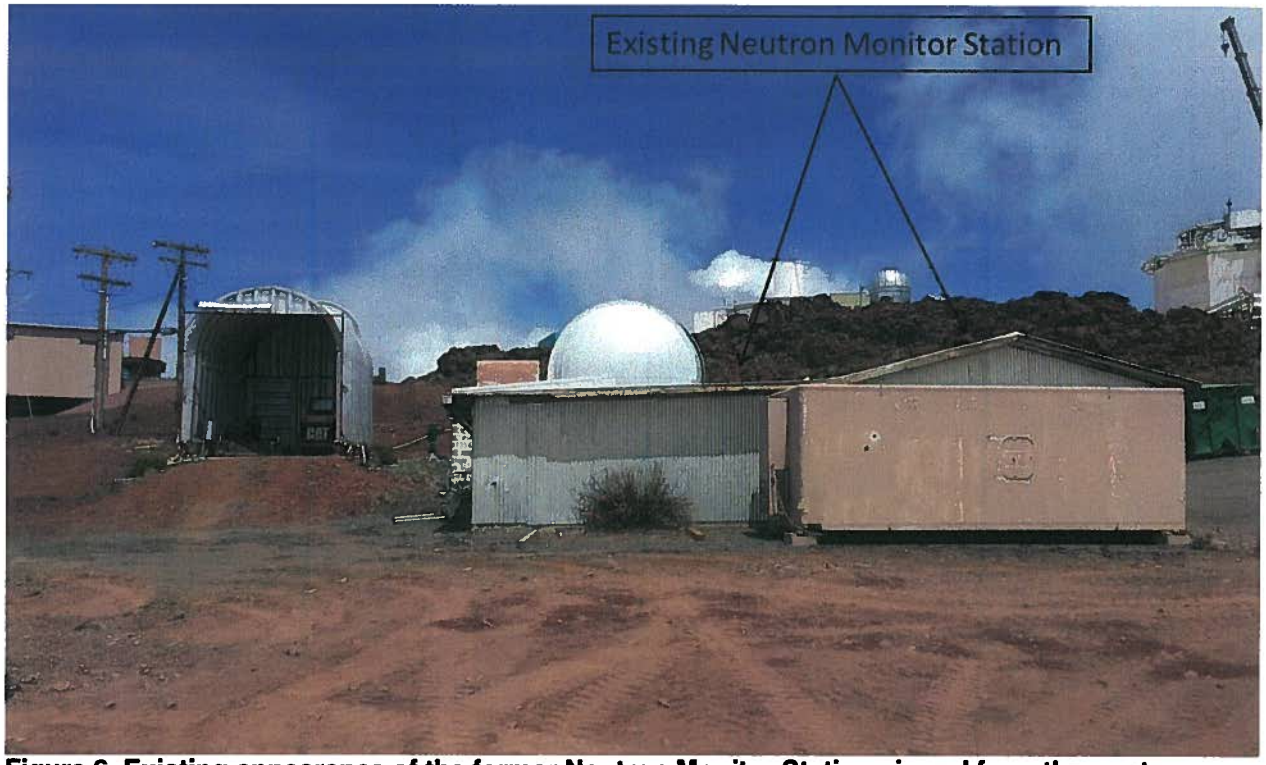

Figure 6 Existing appearance of the former Neutron Monitor Station viewed from the west

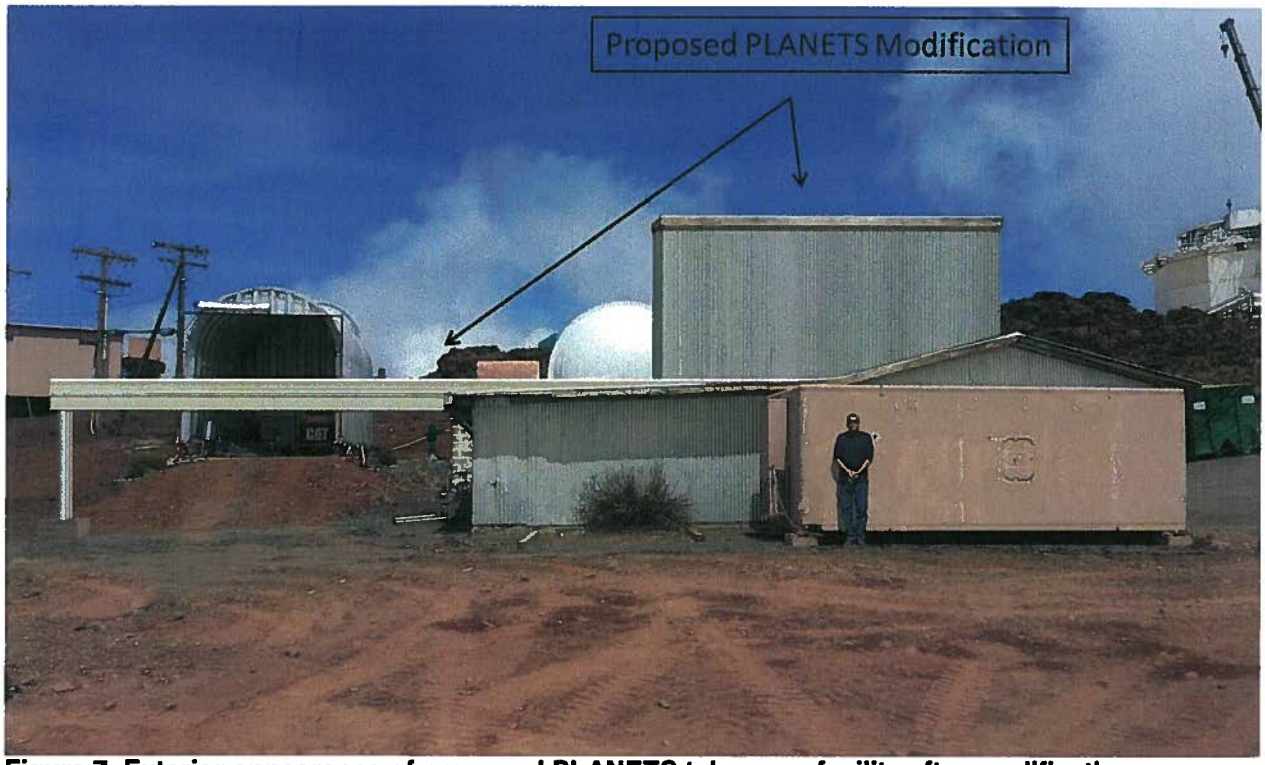

Figure 7 Exterior appearance of proposed PLANETS telescope facility after modification

The proposed work will take an estimated 120 days to complete. The phasing of the work and approximate duration is as follows:

Phase 1 (21 days)
- Commencement preparation
- External building preparation
- Internal building preparation
- Demolition and removal of existing roof and interior walls

Phase 2 (64 days)
- Slab demolition
- Excavation
- Grading
- Construction of piers
- Roll-off roof frame foundation construction
- Forming north slab-on grade
- Roll-off roof steel frame foundation construction
- Roll-off roof construction

Phase 3 (20 days)
- General exterior work
- General interior work
- Equipment Installation
- Demobilization

Existing concrete slabs adjacent to the Chicago building would be used for off-loading shipping containers and some assembly of the roll-off enclosure.

Site Ecology

There is very little soil development at HO, and the surface area is composed of a mixture of pumice, cinders, and ash. Vegetative cover is correspondingly sparse at five to ten percent, which is typical of alpine dry shrubland ecosystems in Hawai`i. The few plants include two endemic daisies (*Dubautia menziesii* and *Tetramoloium numile)*, two endemic perennial grasses (hairgrass, *Deschampsia nubigena* and mountain pili, *Trisetum glomeratum),* hairy cat's ear *(Hypochoeris radicata),* and a single pūkiawe (*Styphelia tameiameiae).* A 2014 survey discovered what appears to be a silverswords hybrid (*Argyroxiphium sandwicense*) and ena ena (*Pseudognaphalium sandwicensium*), a short-lived silvery herb

Fauna are represented by birds, mammals, and arthropods.

85% of the known population of the federally-listed `ua`u (Hawaiian petrel, *Pterodroma sandwichensis)* nests near the Haleakalā summit. At HO there are thirty known burrows along the southeastern perimeter, as well as several burrows to the northwest. This is a typical size for `ua`u colonies in the region.

The birds nest from February to November, with the birds returning to the same nest year after year. `Ua`u leave their nests to feed on ocean fish just before sunrise, and return just before sunset. The petrels have limited vision yet fly at high speeds, which leads to an increased possibility of collision with stationary objects. Other causes of mortality include burrow collapse from wandering goats, predation by owls, and disturbances from road resurfacing activity.

Scientists have observed `ua`u building new burrows deep under the existing facilities. They theorize that the buildings' foundations might allow for more stable burrows as there would be limited risk of collapse from wandering goats.

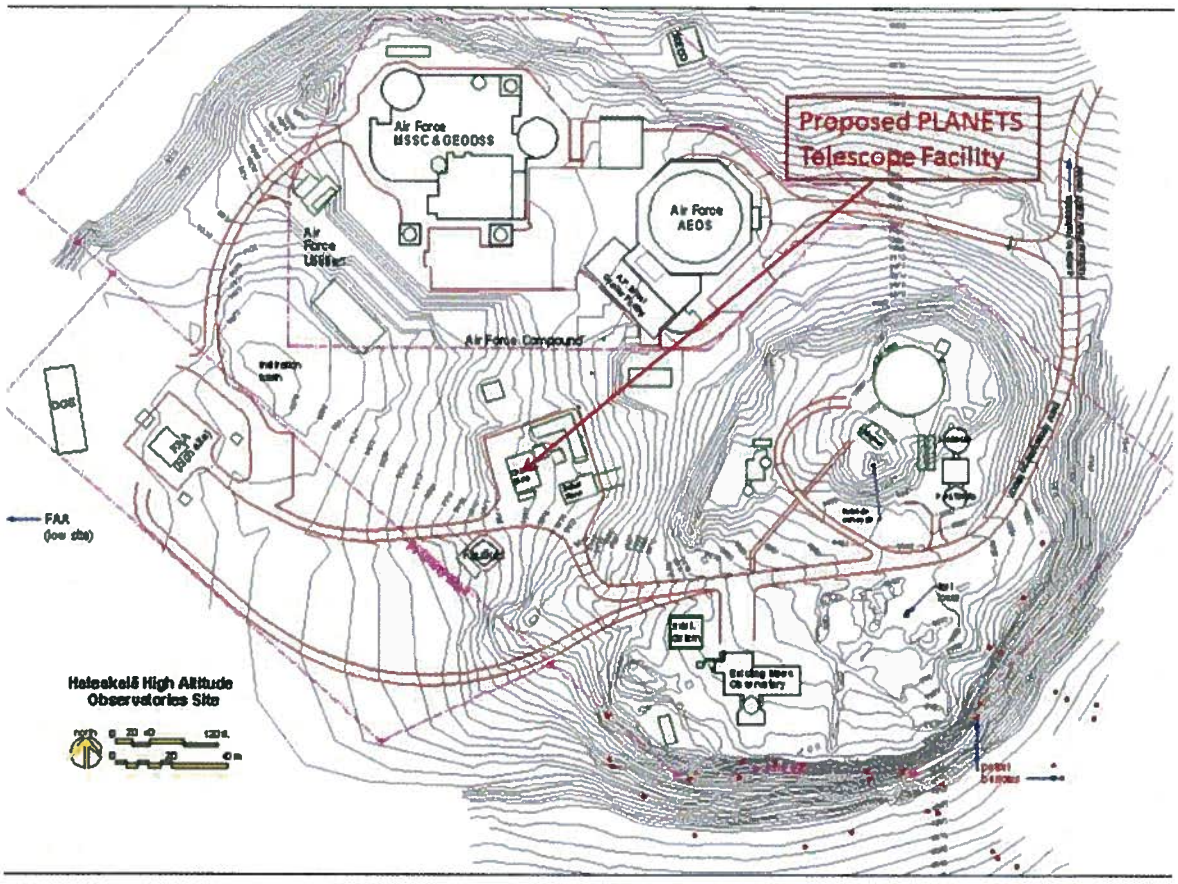

Figure 8 Petrel burrows at HO (red dots)

Nēnē (Hawaiian goose, *Branta sandvicensis)* have been known to fly over HO, but the Kolekole summit area is outside the known feeding range of the geese.

There have been several sightings of `ope`ape`a (Hawaiian hoary bat, *Lasiurus cenerus semotus)* near the summit, but they are believed to reside primarily in the lowlands due to both the cold and the lack of insects for food at the summit.

Multiple surveys of arthropod fauna were conducted. Two surveys did not find any species of note, while a third survey located one carabid beetle (*Mecyclothorax*) and two species of long horn beetles (*Plagithmysus* spp.). Carabid beetles are at risk from alien predators, and their conservation is important.

No ant colonies were found at HO, although predatory ant species have been found in the neighboring Park. The invasive potential of these ants, particularly from the Argentine ant (*Linepithema humile*), calls for active control programs.

Yellow jackets (*Vespula pensylvanica*) were found at the project location. Yellow jackets are a known threat to diversity at Haleakalā, and active management is also required to control these predators.

Introduced fauna include the chukar (*Alectoris chukar),* feral goat (*Capra hircus),* Polynesian rat (*Rattus exulans),* and roof rat (*Rattus rattus).* The goats and rats are a direct threat to the summit's endemic bird species.

Cultural Resources

While Haleakalā's alpine climate was too extreme for permanent habitation, the summit area is extraordinarily rich in historic and cultural sites. At the HO parcel a 2002 archaeological survey identified a trail remnant, wind shelters, petroglyphs, a possible burial feature, and the remnants from an earlier telescope built in 1952. The survey concluded that the general lack of material culture indicated that the area was used more for short-term shelter purposes than extended period of occupation. The one historic site that was identified, the Reber Circle, was a remnant from a 1950s astronomical facility. It was removed in 2012 in accordance with a State Historic Preservation Division-approved data recovery and preservation plan.

Historic cultural practices at Haleakalā included gathering of plants; hunting for `ua`u, nēnē, *Platochen pau* (extinct) and *Branta hylobadisies* (extinct); collecting basalt for tool-making; burial of the dead; burial of umbilical cords; the calling of the sun (*e ala e*); and training for astronomers and navigators. There were certainly other practices that were not widely known outside specific lineages, and there are chants that discuss initiations and rites of passage that occurred on the summit.

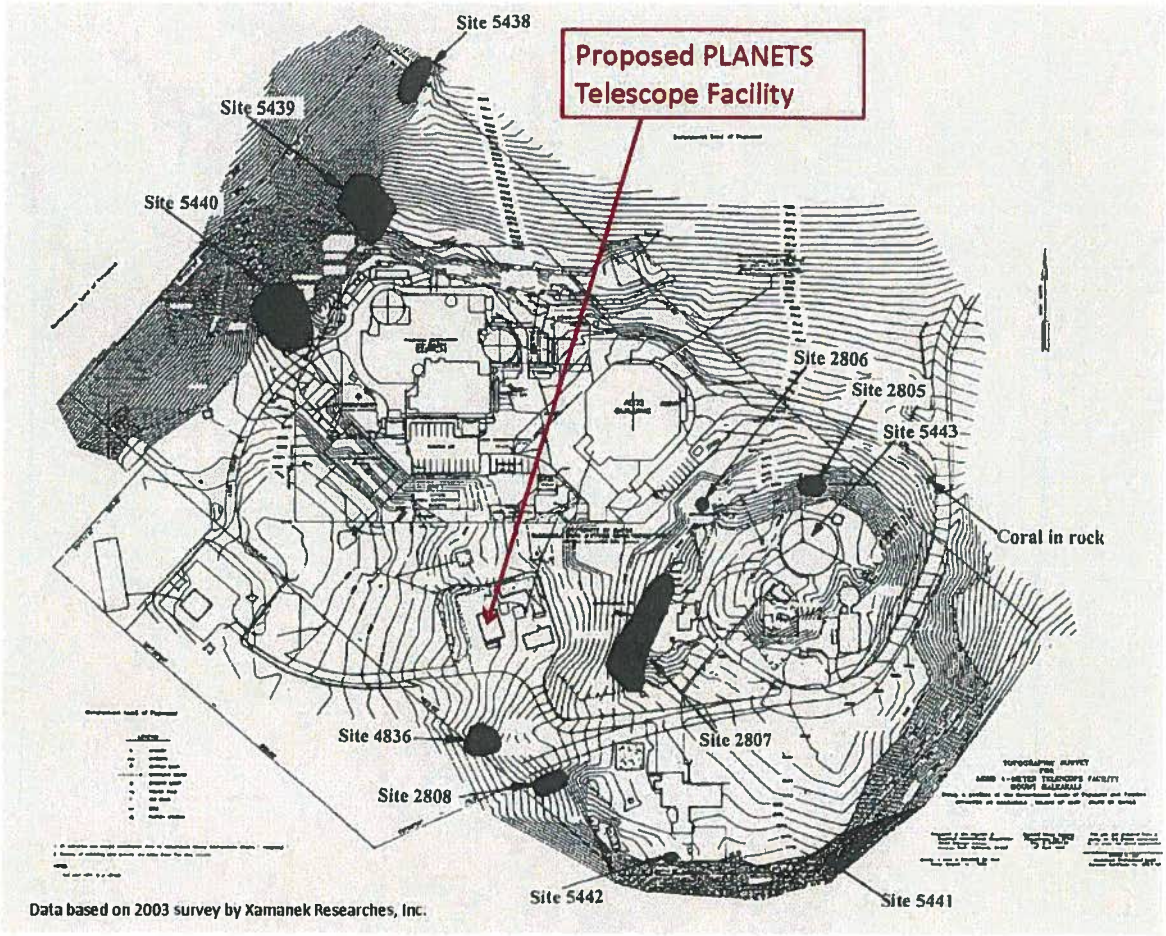

Figure 9 Archeological Resources Within HO

In the modern period the hunting of `ua`u and nēnē is no longer legal, and if burial ceremonies still occur they are kept secret. Other cultural practices continue today. Hula halau and lapa`au practitioners gather materials at Haleakalā, and the site is still used by both Native Hawaiian and various esoteric "New Age" groups for sunrise and sunset ceremonies.

The general public is not allowed to access HO, and recreational activities are prohibited. However, the site is not gated and the HO entrance sign welcomes *Na `ōiwi Hawai`i*. The welcome is not translated into English. The University of Hawai`i has funded the placement of two *ahu*, or stone altars, for religious and cultural use. In addition, the Programmatic Agreement for HO calls for the NSF and the University to provide a "place for shelter" for Native Hawaiian practitioners.

SUMMARY OF COMMENTS

The application was referred to the following agencies for their review and comment:

Office of Hawaiian Affairs; Maui County – Planning Department; DLNR – Land Division, Historic Preservation Division, Division of Forestry and Wildlife; Planning Office; State Department of Health; United States, Fish and Wildlife Service; FAA; National Park Service; and the University of Hawai`i, Institute for Astronomy.

In addition, the CDUA was available for review at the Hawai`i State Library and the Wailuku and Kahului Public Libraries. The documents were also available online at OCCL's website.

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

DLNR Land Division

No comments

DLNR State Historic Preservation Division (SHPD)

SHPD proposed a number of mitigation measures for the project:

- The University of Hawai'i Institute for Astronomy (UH IfA) shall complete Historic American Building Survey (HABS), Historic American Engineering Record (HAER), or Historic American Landscape Survey (HALS). The building is a component of the Baker Nunn facility and its significance comes from its association with the Baker Nunn Facility. The documentation should include the Baker Nunn facility's association with the Cold War.

- UH IfA shall consult with the National Park Service's (NPS) HABS/HAER/HALS (HHH) Coordinator in the Pacific West Regional Office as to the required type and level of HHH documentation and on the guidelines and protocols for submission. Please contact Mary McPartland at Mary_Mcpartland@nps.gov for guidance and any questions.

- UH IfA shall ensure that all documentation activities will be performed or directly supervised by architects, historians, and photographers meeting the minimum qualifications in their field as specified in the Secretary of the Interior's (SOI) professional qualification standards.

- UH IfA shall provide originals of all records resulting from the mitigation documentation to the NPS. A draft of the documentation must be completed prior to the start of work. Please provide SHPD a digital copy of the documentation upon acceptance by the NPS.

Applicant's Response

On January 20, 2017 the project's consultant provided OCCL with the following update on their discussions with SHPD and the National Park Service regarding the Chapter 6E-8 Historic Preservation Review:

- *The first comment requested that we consult with the HHH Coordinator in the Pacific West Regional Office as to the required type of HHH documentation and on guidelines and protocols for submission. We have consulted with NPS Coordinator Mary McPartland several times since December 15th, and agreement has been reached for IfA to conduct a survey leading to a Level III Historic American Engineering Record (HAER) for the proposed structure that would house PLANETS. The field survey will take place on January 27th with documentation to follow.*

- *The second comment requested that all documentation activities be conducted or supervised by architects, historians, and photographers meeting minimum qualifications in their field. We have selected Mason Architects in Honolulu to conduct the HAER documentation. They have provided individuals with the necessary qualifications. The HHH Coordinator for the Pacific West Regional Office has indicated that she is familiar with Mason Architects, and she commented on the excellence of their work in HHH documentation.*

- *The third comment requires IfA to submit a draft of the documentation prior to start of work on PLANETS. We anticipate that the survey and draft HAER Level III will be completed no later than the end of February and submitted to NPS in early March, which will meet the requirement for submission prior to construction, given that there is no construction contemplated before November of 2017.*

The applicant notes that NPS typically can take several months before completion of the historic documentation process.

OCCL Comments

OCCL has consulted with SHPD staff, who confirmed that UH-IfA has been diligent in following their recommendations. SHPD has no objections to the Department continuing with the CDUA permitting process.

ANALYSIS

OCCL notified the applicant on September 21, 2016 that:

1. The project was an identified land use pursuant to HAR §13-5-24, P-8 STRUCTURES AND LAND USES, EXISTING (C-1), *Moderate alteration of existing structures, facilities, uses, and equipment.* This land use requires a permit from the Chair of the Board of Land and Natural Resources.

   Pursuant to §13-5-33 DEPARTMENTAL PERMITS (j), the Chair decided that the permit decision should be made by the Board of Land and Natural Resources due to the public interest in development on Haleakalā. The Board will have the final authority to grant, modify, or deny any permit.

2. Pursuant to HAR §13-5-40 HEARINGS, the proposed use does not require a public hearing;

3. Pursuant to HAR §13-5-31 (4) *Permit applications,* the permit requires an environmental assessment.

   A draft Environmental Assessment was published for the project in the July 23, 2016 edition of the Office of Environmental Quality Control's *Environmental Notice*. The Institute for Astronomy was the accepting authority. A Finding of No Significant Impact (FONSI) was published on October 23, 2016.

4. Any facilities at Haleakalā Observatories need to be in compliance with the Haleakalā Observatories Management Plan approved by the Board of Land and Natural Resources in 2010.

CONSERVATION CRITERIA

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

1. *The proposed land 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.

   The parcel was conveyed to the University of Hawai`i by Executive Order 1987, which stated that land was to be used for "the Haleakalā High Altitude Observatory Site purposes only." The repurposing of an old astronomy facility is consistent with this objective

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

The objective of the General subzone is to designate open space where specific conservation uses may not be defined, but where urban use would be premature.

The proposed use is an identified land use in the General subzone of the Conservation District, pursuant to HAR §13-5-24, R-3 ASTRONOMY FACILITIES, (D-1) *Astronomy facilities under an approved management plan.*

Approximately 40% of the 18-acre parcel is developed with roads, parking lots, and astronomy facilities. The proposed PLANETS facility will utilize an existing facility, and thus should have a negligible effect on open space at Haleakalā.

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

The goals of the CZM program are to address issues from an integrated ecosystem perspective. No lands in Hawai`i are more than 30 miles from the shore, and land uses anywhere in the state have the potential to have secondary impacts in the coastal zone.

Many of the objectives of the CZM program outlined in HRS 205A – protection of historic resources, scenic and open space resources, and recreational resources – parallel the objectives of the Conservation District. The program outlines ten key areas to protect and preserve. The PLANETS proposal

- Recreational Resources – The HO site is not open to the general public. Cultural practitioners traverse the area to access two ahu on the perimeter of the site. The PLANETS facility will not impede access to the ahu, or be visible from them.
- Historic Resources – The University is actively working with the National Park Service and the State Historic Preservation Division to ensure compliance with historic preservation rules and guidelines.
- Scenic and Open Space Resources – As discussed on the following pages, the facility will not have an impact on open space, and will not be visible from public view plains outside of the HO parcel.
- Economic Uses – The development will have a small positive impact on the State's economy through the creation of construction jobs and white collar jobs.

- Coastal Hazards – The project area is not on the coast.
- Managing Development – The project involves retrofitting an existing building, and will not lead to an increase in the intensity or density of land use on the summit.
- Public Participation – The public was invited to comment on both the environmental assessment and the Conservation District Use Application. There was no public opposition to the proposal.
- Beach Protection – The project is not near the coast.
- Marine Resources - There are no surface water features in the project area, and there are no anticipated impacts on groundwater. The only intermittent body of water at HO is an infiltration basic at the western end of the complex that collects storm water runoff. The nearest stream is Waikamoi Stream, 1.9 miles downslope. Construction work will occur within the interior of the building, with the exception of new exterior column footings, which will occur within the existing slab area. The foundation work and grading will not result in changes to hydrologic flow at the site.

OCCL believes that the proposal is consistent with the guidelines and objectives contained in HRS 205A.

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

There have been numerous cultural and environmental studies done as part of the UH IfA Long Range Development Plan and the UH IfA Management Plan. In addition, this proposal prepared an Environmental Assessment which examined potential impacts on land use, visual resources, biological resources, cultural resources, transportation, hydrology, hazardous material and waste, air quality, and noise.

The Environmental Assessment and the other studies and surveys indicate that the PLANETS project will not have significant impact on the resources at the site. This will be explored further in the following discussion section.

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

The HO site has contained astronomy facilities since the 1950's.

The Haleakalā Observatories Management Plan contains over fifty conditions regarding Monitoring Strategies, Cultural and Historic Preservation Management, Environmental Protection of Site Resources, Construction Practices, and Facility Design Criteria.

The Management Plan contains specific requirements for the design of new facilities. These are:

- New facilities will not be permitted to obscure the observation function of existing facilities
- New facilities will not be permitted to impact `ua`u habitat. They will not be fenced, and will not have unshielded lights or other attractants.
- New facilities will not impact known archaeological resources, and no construction will be permitted within fifty feet of any site or feature.
- New facilities will be painted to match the color of the cinder and lava when possible, with the understanding that daytime observatories can be painted white in order to keep the inside temperatures cool.
- Construction design will consider sight plains to population centers in Maui.
- When possible natural materials will be used for façades, walls, walkways, entryways, etc.
- IfA will seek broad public comment on any new construction activities.
- New facilities will be designed to minimize potential adverse impacts from natural and anthropogenic hazards.

OCCL notes that the design of the proposed PLANETS facility is consistent with each of these guidelines. PLANETS would occupy a current facility and utilize a roll-off roof system for its modifications designed to minimally impact existing natural resources within the surrounding area. Modifications would take place primarily within the existing structure and foundation, and the exterior appearance of the original wall structure would remain largely unchanged. In addition, minor ground disturbing modifications would take place during the non-nesting season of the Hawaiian petrel in order to avoid any potential impact to this seabird. After completion, the PLANETS facility would continue to be one of the lowest structures within HO and would not be visible from outside HO.

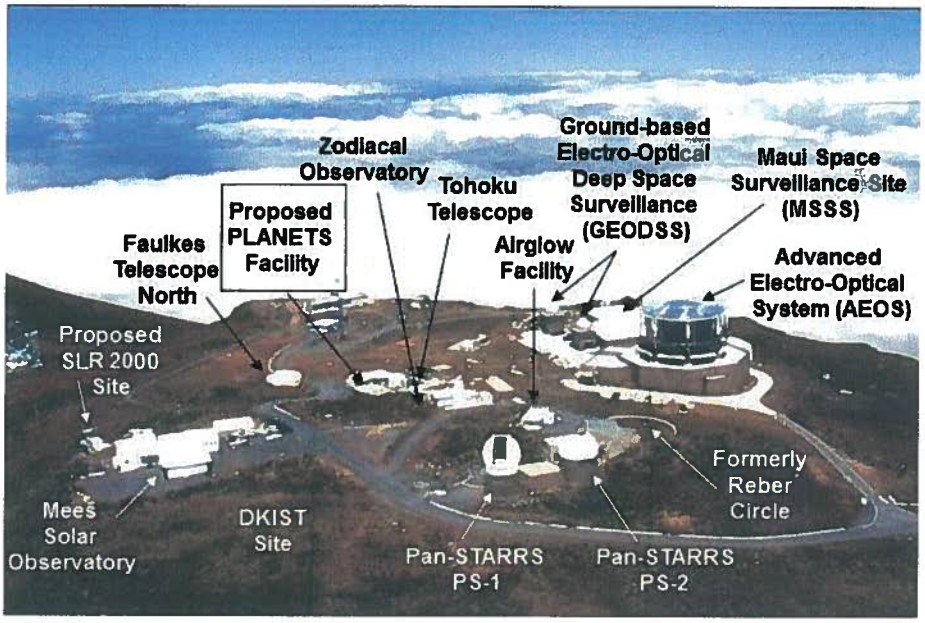

Figure 10 Aerial view of HO and the Proposed PLANETS Facility

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

The topography of the land will not be changed, and there will only be minor changes to open space. The view plain from outside HO will not be affected.

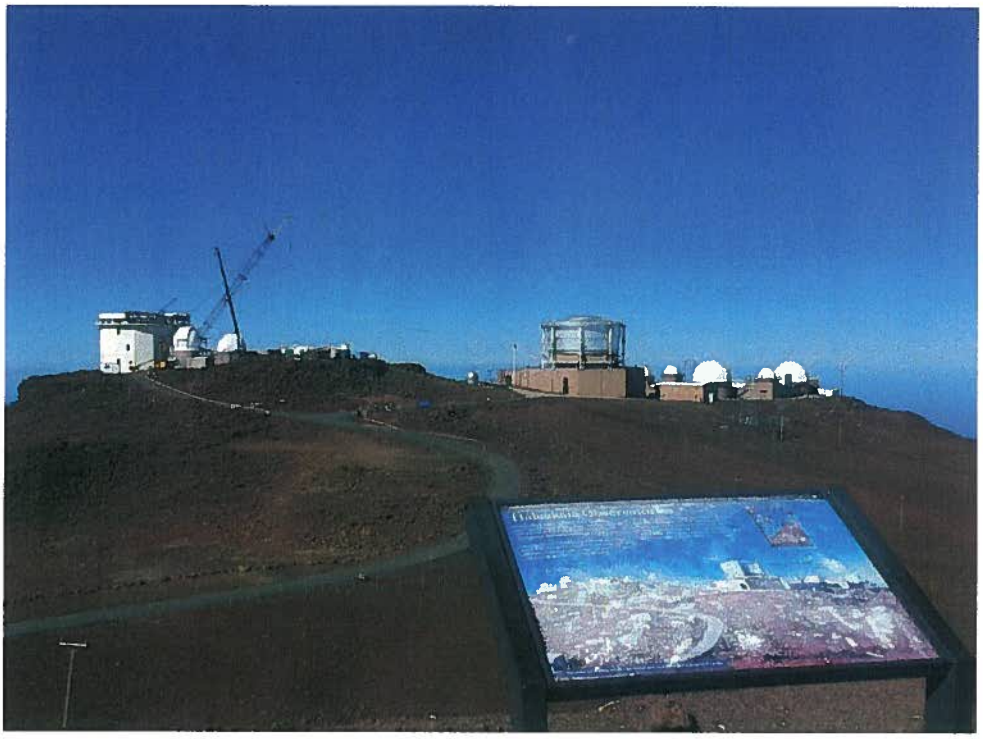

Figure 11 View from Pu'u Ula'ula (Red Hill) Overlook (PLANETS not be visible)

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

There will be no subdivision of land for this proposed project.

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

Staff believes the proposed project has the potential to benefit the public health, safety, and welfare. There will be direct economic benefits through construction contracts, new jobs, and incoming research grants; as well as educational benefits by keeping Hawaiian institutions at the forefront of astronomical research. There is also the less tangible benefit of increasing humanity's overall pool of knowledge.

OCCL does not find any elements of the proposal that would be detrimental to public health, safety, or welfare.

DISCUSSION

The University of Hawai`i Institute for Astronomy proposes to construct a new astronomy facility, the proposed Polarized Light from Atmospheres of Nearby Extra-Terrestrial Systems (PLANETS), by renovating an existing 1620 square-foot building at the Haleakalā High Altitude Observatory Site.

The application and associated environmental assessment contain discussions on the biological, historical, and cultural resources of the parcel and of the project area.

The applicant concludes that there will be minimal to no impact on these resources, given that the work will be conducted on land that has been previously disturbed, and involves the retrofitting of an existing structure rather than the construction of a new structure. There will be limited ground disturbance, and no changes to the areas topography or hydrology is foreseen.

The facility is not located near any known cultural resources, and will not be visible or heard from any of the documented archaeological sites at HO. In addition, there are no threatened or listed species within the immediate project area.

The environmental assessment did not identify any impacts that might be moderate or severe in intensity. The applicant has identified a number of management actions that will mitigate any potential impacts. The full list of best management practices is attached as **Exhibit 1**. OCCL would like to highlight the following:

- The endangered 'ua'u (Hawaiian petrel, *Pterodroma phaepygia sandwichensis)* nests in the HO region. The applicant states that the nearest known burrow is over 300 feet from the project site. Nonetheless, the work schedule has been designed so that ground disturbance will not take place while the birds are in their burrows. Phase 2 will take place outside the months when petrels are present.

- To prevent introduction of alien species, the IfA will have all construction materials brought to the site inspected by a qualified biologist before entering The National Park.

- The control and operation of the proposed PLANETS telescope will be remote and there will not be a significant increase in the volume or type of vehicular traffic to or from HO. Only periodic maintenance will be required, therefore there will be no effect on air quality or noise level from vehicular sources.

- The remote telescope controlling system and spectrographs to be installed in the structure are anticipated to operate well below defined noise limits.

- The facility will not maintain hazardous materials on site. Should there be a spill during construction the contractor will be required to report it immediately to the on-site IfA supervisor, and spill remediation will be overseen by UH personnel. Any costs will be assigned to the contractor.

KA PA`AKAI ANALYSIS

Articles IX and XII of the State Constitution, other state laws, and the courts of the State require government agencies to promote and preserve cultural beliefs, practices, and resources of Native Hawaiians and other ethnic groups.

Cultural Assessment and Traditional Practices assessments for the HO area were completed in March 2003 (LRDP), January 2006 (CKM Cultural Resources), and May 2007 (Cultural Surveys Hawai'i).

Within Kolekole the surveys identified temporary habitation and wind shelters, two petroglyphs, one possible burial site, and two ceremonial sites. These sites are all outside of the current project area.

Historically, the area was used for religious ceremonies, basalt quarrying, and hunting. In the modern era, the University has previously contracted with Hawaiian stonemasons to erect an east-facing and a west-facing ahu for the cultural and religious use of indigenous practitioners. The proposed facility will not impede access to either site. The facility will not be visible from either site, not will the facility create any ambient noise that can be heard from either site.

After careful review of the application and associated environmental documents, and balancing the potential benefits against the potential impacts of the project, OCCL will recommend that the Board approve this proposal.

As such, staff recommends as follows,

RECOMMENDATION

Based on the preceding analysis, Staff recommends that the Board of Land and Natural Resources approve this Conservation District Use Application (CDUA) MA-3779 for the Polarized Light from Atmospheres of Nearby Extra-Terrestrial Systems (PLANETS) facility at the Haleakalā High Altitude Observatory Site, Pu`u Kolekole, ahupua`a of Papa`anui, moku of Honua`ula, Makawao District, Maui, TMK: (2) 2-2-007:008, 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 Hawaii 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 obtain appropriate authorization from the department for the occupancy of state lands, if applicable;

4. The permittee shall comply with all applicable department of health administrative rules;

5. The single family residence shall not be used for rental or any other commercial purposes unless approved by the board. Transient rentals are prohibited, with the exception of wilderness camps approved by the board;

6. The permittee shall provide documentation (e.g., book and page or document number) that the permit approval has been placed in recordable form as a part of the deed instrument, prior to submission for approval of subsequent construction plans;

7. Before proceeding with any work authorized by the department or the board, the permittee shall submit four copies of the construction plans and specifications to the chairperson or an authorized representative for approval for consistency with the conditions of the permit and the declarations set forth in the permit application. Three of the copies will be returned to the permittee. Plan approval by the chairperson does not constitute approval required from other agencies;

8. 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;

9. All representations relative to mitigation set forth in the accepted environmental assessment and conservation district use application for the proposed use are incorporated as conditions of the permit;

10. The permittee understands and agrees that the permit does not convey any vested right(s) or exclusive privilege;

11. 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;

12. When provided or required, potable water supply and sanitation facilities shall have the approval of the department of health and the county department of water supply;

13. 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;

14. Obstruction of public roads, trails, lateral shoreline access, and pathways shall be avoided or minimized. If obstruction is unavoidable, the permittee shall provide alternative roads, trails, lateral beach access, or pathways acceptable to the department;

15. During construction, appropriate mitigation measures shall be implemented to minimize impacts to off-site roadways, utilities, and public facilities;

16. Cleared areas shall be revegetated, in accordance with landscaping guidelines provided in this chapter, within thirty days unless otherwise provided for in a plan on file with and approved by the department;

17. Use of the area shall conform with the program of appropriate soil and water conservation district or plan approved by and on file with the department, where applicable;

18. The permittee shall obtain a county building or grading permit or both for the use prior to final construction plan approval by the department;

19. 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 Hawaii, and by Hawaii statutory and case law;

20. 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 HPD (692-8015), which will assess the significance of the find and recommend an appropriate mitigation measure, if necessary;

21. The Requirements set out in the Haleakalā Observatories Management Plan for Monitoring Strategies, Cultural and Historic Preservation Management, Environmental Protection of Site Resources, Construction Practices, and Facility Design Criteria are incorporated as conditions of this permit;

22. The Best Management Practices discussed in the application, and attached to this report as Exhibit 1, are incorporated as conditions of this permit;

23. Other terms and conditions as prescribed by the chairperson; and

24. Failure to comply with any of these conditions shall render a permit void under the chapter, as determined by the chairperson or board.

Respectfully submitted,

Michael Cain

Michael Cain, Staff Planner
Office of Conservation and Coastal Lands

Approved for submittal:

Suzanne Case, Chairperson
Board of Land and Natural Resources

PLANETS Best Management Practices

Best Management Practices that will be used during construction and implementation of the proposed land use are outlined in the University of Hawai'i Institute for Astronomy Haleakalā High Altitude Observatory Site Haleakalā, Maui, Hawai'i Management Plan, Section 3.5.3.2, as follows:

All subcontractor personnel working at HO must receive IfA-approved environmental training, prior to beginning work. This training program explains and amplifies the requirements imposed on all construction projects within HO boundaries.

For environmental protection, the IfA requires the following to protect vital environmental resources:

1. HALE has experienced the introduction of destructive non-native species that compete with and have in some cases displaced native plants and insects. These introductions threaten the ecological balance at the summit area, and in cooperation with HALE, IfA requires any contractor to take the following measures at HO to prevent construction or repair activities from introducing new species:

    a. Any equipment, supplies, and containers with construction materials that originate from elsewhere, i.e., the other islands or the mainland, must be checked for infestation by unwanted species by a qualified biologist or agricultural inspector prior to being transported to the summit. Specimens of non-native species found in these inspections are to be offered to the state for curation, and those not wanted are to be destroyed. All construction vehicles that will be used off paved surfaces must be steam cleaned/pressure washed before they travel or are transported through HALE. It shall be the sole responsibility of the contractor to coordinate inspections with the HALE Business and Revenue Program Specialist.

    b. Importation of fill material to the site is prohibited, unless such fill (e.g., sand) is sterilized to remove seeds, larvae, insects, and other biota that could survive at HO and propagate. All material obtained from excavation is to remain on Haleakalā. Surplus excavated cinders, soil, etc., is to be offered to other agencies located at the summit or HALE.

    c. Contractors are required to participate in IfA-approved pre-construction briefings to inform workers of the damage that can be done by unwanted introductions. Satisfactory fulfillment of this requirement can be evidenced by a signed certification from the contractor.

    d. Parking of heavy equipment and storage of construction materials outside the immediate confines of HO property is prohibited.

    e. Contractors are required to remove construction trash frequently, particularly materials that could serve as a food source that would increase the population of mice and rats that prey on native species.

2. The endangered ʻuaʻu, or Hawaiian Petrel, occupies burrows on the upper slopes of Haleakalā from February to October. The burrows are located in cinder and are active year after year, since the birds return to the site of their birth. Petrels are night flying birds, leaving their burrows to search for food during nesting and fledgling seasons. The burrows are located on the south slopes below the MSO facility and on the north slopes below the MSSC. The following requirements are in place to ensure that the ʻuaʻu habitat will be protected during any construction activities.

   a. During the months when ʻuaʻu are present on Haleakalā, care must be exercised to ensure that ʻuaʻu will not be disturbed. Therefore, vibration and noise from heavy construction equipment or activities must not impact the normal life-cycle of resident birds. If heavy construction equipment will be necessary at the HO site, consultation with the USFWS, the Division of Forestry and Wildlife (DOFAW), and avifaunal experts will be required to determine feasibility and any applicable mitigation requirements.

      Furthermore, it would be necessary to determine whether human receptors in areas outside of the HO would be affected by construction noise. There are areas within HO close enough to HALE visitors, such that they would be able to detect noise from construction of and traffic at the proposed facilities. These sounds could affect Native Hawaiian cultural practitioners and those engaged in recreation at nearby locations. The analyses provided by the contractor would be used to help develop methods to avoid, minimize, or mitigate such noise where it would or may affect endangered species, sensitive cultural practices, or the experience of visitors to the summit area outside of HO.

      Such methods could include:

      i. Workers at the site must be informed of vibration, noise, and lighting hazards to endangered species, that their activities are to be confined to the construction site to minimize risk to birds in adjacent areas, and that noise sources should be shielded where possible.

      ii. Conducting all noise-emitting activities within strict day and time constraints, with work prohibited during sensitive nighttime periods.

      iii. Reducing or substituting power operations/processes through use of proportionally sized and powered equipment necessary only for tasks at hand.

      iv. Maintaining all powered mechanical equipment and machinery in good operating condition with proper intake and exhaust mufflers.

      v. Turning off or shutting down equipment and machinery between active operations.

   b. Contractors will be given current maps of locations of ʻuaʻu burrows to assist with ʻuaʻu conservation. HALE biologists are continuously finding and mapping new ʻuaʻu burrows and these maps are made available to IfA for planning purposes.

c. HO personnel will notify USFWS of any 'ua'u mortalities. Contractor personnel wi report mortalities to IfA immediately.

d. Construction of fences will be avoided, to prevent 'ua'u mortality from collisions.

e. Lighting for construction hazards or night work must be approved by IfA prior to installation. All lighting must be shielded from above, so that night flying birds will not be disoriented by upward projecting lights that are mistaken for natural sources of navigable lighting.

f. To avoid attracting 'ua'u, contractors will make every effort not to use safety/security lighting the same color as stars. Other colors, such as red, blue, or orange or similar colors, should be considered.

In addition to the language in the BMP's, and as further clarification, lighting at HO is carefully controlled to avoid degradation and invalidation of data from the various astronomical sensors used during dark hours. There are no outdoor lights permitted at the site at night, except for momentary illumination by personnel with red-filtered flashlights, which may be used to navigate obstacles, illuminate controls on outdoor equipment, etc.

3. HO is located in a cinder cone in a State Conservation District. Construction at the site requires special care to maintain the unpolluted environment.

a. No hazardous materials are to be released at the site. Substances such as surplus or used paint, oil, solvents, cleaning chemicals, etc., must be removed from the area and disposed of properly.

b. Accidental spills of any hazardous material during the execution of a contractor's project at the site must be reported immediately to the IfA. Spill containment will be supervised by UH personnel at the site.

c. Spill remediation methods must be approved by the University of Hawaii's Environmental Health and Safety Office (EHSO) prior to clean-up, and all costs incurred for clean-up will be paid by the contractor. In the event of a release, the contractor will be liable for any Federal- or State-imposed response action, costs, or penalties.

In addition to the language in the BMP's, and as further clarification, the HO Management Plan requires that accidental spills of any hazardous material during the execution of a contractor's project at the site must be reported immediately to the IfA. Spill containment will be supervised by UH personnel at the site and spill remediation methods must be approved by the University of Hawaii's Environmental Health and Safety Office (EHSO) prior to clean-up. Containment methods include absorption of spilled petroleum products to prevent further spreading and contact with the environment, including unlikely contact with petrels at such time when they may be in the summit area of Haleakalā.)

d. Washing and curing water used for aggregate processing, concrete curing, clean up, etc., cannot be released into the soil at the site. A recovery process is required by the contractor to capture wastewaters.

4. It is of particular importance to maintain a dust-free environment at HO. Telescope mirrors, lenses, and sensors can be quickly damaged by wind born dust. HO is located at 10,000 feet, and is often exposed to winds in excess of 30 miles per hour (mph). Before, during, and after winter storms, winds can exceed 50 mph. The natural substrate at the site is a mixture of fine volcanic sand and cinders. Fugitive dust from the finer material can be released when the substrate is disturbed. Therefore:

   a. Contractors must establish a written dust control plan that must be observed by all contractor personnel during the project. Contractors will adhere strictly to the requirement that dust be controlled at all times, including non-working hours, weekends, and holidays.

   b. Dust control must be accomplished by equipment that the Contractor keeps on site and sprinkling or similar methods will be required to keep disturbed finer material from becoming airborne and must result in less than 10 pounds of fugitive dust released into the atmosphere per 24-hour period, as measured by standard collection methods.

   c. No oil or chemical treating shall ever be used at the site for dust control.

   d. Dust resulting from surface preparation of surfaces to be painted by sanding, power tools, or scraping and brushing shall be controlled by the Contractor by use of catchments and filtering systems/devices to prevent damage to the telescope mirrors, lenses and sensors.

   e. Where practical, erect a designated on-site facility with wash racks to clean equipment and machinery before they are removed from construction zones.

   f. Reduce vehicle emissions from construction projects and operations at HO by establishing worker carpools and shuttles to and from the job site, and mitigate construction equipment/machinery emissions by using proper emission-control technologies and standard exhaust filtration devices.

5. Construction or refurbishing of existing facilities will result in quantities of solid waste, and remnants of food and packaging that construction crews may bring for consumption at the site. Therefore:

   a. Only materials that are not hazardous wastes can be managed as solid waste at the site.

   b. Solid waste cannot be stockpiled or dumped at the site or on the slope below the HO facilities. Construction contractors must remove construction trash frequently, particularly food sources that could increase the population of mice and rats that prey

on native species. Most construction waste should be removed in roll-off trash receptacles that are covered before transport.

c. Construction and demolition solid waste and debris must be secured such that strong winds cannot disperse materials. This is particularly important during weekends, holidays, and other non-working hours.

d. Construction and demolition solid waste and debris should be transported to the Maui Demolition and Construction Landfill in Ma'alaea.

e. No food is to be left on the ground or in HO solid waste storage areas. This is to prevent attraction of rats and other pests.

f. Non-hazardous trash and solid waste will be transported in covered refuse containers and disposed of off-site at Maui's licensed landfill.